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Cognitive Interviewing Using a CARL Grant: Keeping Research Valid on a Budget

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Instructing undergraduate students in information literacy concepts is a familiar part of being an academic librarian. Assessing the effectiveness of this instruction is necessary if we are to know how best to instill students with scholarly, responsible habits and useful skills in information consumption and production. Accordingly, some researchers at academic institutions have administered tests and surveys to gauge how much undergraduates gain from information literacy instruction. But how can we be sure that our test and survey questions are themselves clear in their meaning to students?

One practical means of doing so is cognitive interviewing. This process involves asking student volunteers to read proposed questions under standardized conditions, and having them identify any aspects of the questions that seem confusing or unclear. This article describes the cognitive interviewing component of a research project that was conducted at San Jose State University. This research project was funded through a grant from CARL in 2010 to Shannon Staley and Tina Peterson. To learn more about the larger research project of which the cognitive interviews were a part, see http://www.sjsu.edu/faculty/sstaley/sila/. This article also provides guidelines for any researcher interested in using cognitive interviewing to standardize the questions of an information literacy instruction assessment test or survey.

During the Fall 2010 semester at San Jose State University, Education and Web Services Librarian Shannon Staley and colleagues administered a test of seventeen multiple-choice questions to undergraduate students attending information literacy instruction sessions at SJSU King Library. These questions covered skills and concepts central to information literacy and library research, and were administered to students before and after instruction sessions to gauge student learning.

Before these tests were administered, the seventeen questions and their answers were standardized through a cognitive interviewing process. In August 2010 Francis Howard, Senior Assistant Librarian at SJSU King Library, and Tom Hewitt, a Library and Information Science graduate student at SJSU, conducted cognitive interviews with ten undergraduate students to identify any problems of clarity in the questions and their answers. Over a three-day period, students were asked as they entered or left King Library if they wished to be interviewed.

Shannon developed a cognitive interview screener and a cognitive interview script for Francis and Tom to use in gathering volunteers. The screener consisted of six questions asked of students who volunteered to participate:

- Are you a student at San Jose State University?
- Are you an undergraduate student? (The research was targeting SJSU undergraduate students only, not graduate students.)
- Do you work as a volunteer, intern, or student assistant for the SJSU King Library? (The research was measuring the information literacy knowledge of those students who had limited or no experience with the academic library.)
- What is your major? (Health science-related majors were disqualified for the interviews, as these students might later participate in taking the information literacy assessment tests themselves.)
- Please indicate your academic level in school. (Student input was later analyzed in comparison with academic level, from freshman to senior.)
- Please indicate your gender. (We were interested in possible gender differences in interview feedback.)

The cognitive interview script, read to those students who had passed the screener, explained why the researchers were conducting the interviews. The script also made it clear to the student that we wished for all the feedback he or she could provide on the clarity of each question.

Francis helped guide the students through the interviews while Tom took notes on the feedback received. On each question, Francis would ask the student these two questions to help elicit feedback:

- In your own words, what is this question asking?
- Are there any terms that are unclear to you?

From the students' responses, the interviewers gathered many valuable suggestions for revision. Below is an example of how student feedback helped us improve question and answer wording. Here is a question in its original form:

If you are searching using the keywords "children" AND "ADHD" but get quite a few articles about children with ADHD and autism instead of children with just ADHD, how would you eliminate the articles about autism?

- Use OR autism at the end of your current search strategy
- Use AND autism at the end of your current search strategy
- Use NOT autism at the end of your current search strategy
- Sort your original search results by date
- Not sure

Based on interview feedback, the authors discovered that some interviewees were confused by the term "current search strategy" in the answers. Therefore, in the revised version of the question, we decided to change the answers to state what the string of search terms would be for each choice. Also, we decided to change the search terms from "ADHD" and "autism" to

"bullying" and "stalking". This was done to make the search terms less clinical and more easily understandable by all test-takers. Here are the revised question and its answers:

If you are searching using the keywords "children" AND "bullying" but get many articles about children who are bullies and stalk other kids, how would you eliminate the articles about stalking?

- Use "children" AND "bullying" OR "stalking"
- Use "children" AND "bullying" AND "stalking"
- Use "children" AND "bullying" NOT "stalking"
- Sort your original search results by date
- Not sure

We found that the cognitive interviews helped greatly in creating questions and answers that would be more easily understandable to all undergraduates attending information literacy instruction sessions. Student feedback suggested revisions for fourteen of the seventeen multiple-choice questions. Most revisions involved changing words and phrases to make their meaning clearer to students who might not understand all of the terms and resource names familiar to academic librarians. For example, in one question, the term "core databases" was changed to "most important databases". In another, "PsychInfo" was changed to "PsychInfo database".

The following are lessons the interviewers gained from the experience of recruiting volunteers and conducting interviews. These guidelines can help any researcher gather cognitive interview feedback that is genuinely helpful in improving test design and wording.

- Pre-arranging interviews at a specific time runs the risk that volunteers will not show up. Asking students as they exit or enter the library if they wish to take part in an interview tends to be a more efficient method of soliciting volunteers.
- Have one person guide the volunteer through the interview, and one person take notes of the interviewee's feedback. It is best to take the notes on a copy of the test questions.
- Administering the interviews at a location close to the site of soliciting volunteers improves the chance that students will agree to be interviewed.
- Offering an incentive for participation in the interview process may make volunteers more "eager to please" the interviewers in the way they offer feedback. If you choose to give a reward to volunteers, make it known to them only after an interview is completed.
- Asking an "ice-breaker" question before the interview begins can be a useful way of making the volunteer feel more at ease. To help the interviewees relax into the interview, the interviewers asked them what they did over the previous summer that was fun, and shared some experiences of their own.

- Make sure the interviewees understand that they are only to provide feedback as to whether the questions and answers are understandable – not say what they think the right answers are.
- Have the interviewees read the questions and answers aloud to help you identify anything in them that might cause confusion. Ask the interviewees not only to identify anything they do not understand about the questions or answers, but to explain, in their own words, what each question is asking. This can help draw out sources of confusion that the interviewees may have trouble articulating.
- Address potential volunteers in a way that will engage their interest and allow them to relate to your research project. Francis and Tom addressed potential volunteers in this way: "Hi. We're trying to improve the way we teach students research skills at the library. Would you be interested in taking part in a research survey?" Students can relate to the experience of conducting research, or learning how to conduct research, at a campus library.
- Strive for balance in ethnicity, gender, and academic major in your set of interviewees. Include students whose first language is not English, as they might provide insight into how questions can be more clearly worded for this student population.
- The interviewers of this project (both men) observed while recruiting participants that women seemed more reluctant to volunteer than men. We came to the conclusion from our observations that having one woman and one man as interviewers could achieve more gender balance in participation.
- If possible, have all researchers meet after each day of gathering interview feedback. This will allow you to discuss and address any problems encountered in the interviewing process.
- Have all researchers meet after all interview results have been gathered to discuss what question changes are warranted in light of student feedback. This discussion can even generate ideas for question revision beyond changing what has been identified as problematic in the questions by students.

We should also note that cognitive interviewing is practical because it can be done with a small number of volunteers. Scholarly research confirms the value of interviewing only a handful of participants. According to Patton (2002), qualitative methods produce detailed data with a small number of students and cases. Patton also says that making decisions about samples and sample strategies depends on previous decisions about the unit of analysis. Qualitative research includes in-depth and small samples that are selected purposefully (Patton, 2002). Creswell (2007) recommends in phenomenology, that he witnessed the number of participants in a sample size in a study to range from 1 (Dukes, 1984) up to 325 (Polkinghorne, 1989). Dukes (1984) suggests using 3 to 10 participants and Riemen (1986) used 10 participants in a study. Freud researched the field of psychoanalysis using less than 10 cases (Patton, 2002). Lincoln and Guba (1985) recommend using a sample size selection that ends in redundancy. Patton (2002) advocates for qualitative small sampling that is based on reasonable coverage of the phenomenon that is used for the purpose of the study and interests of the stakeholders. Patton (2002) also favors gathering detailed information from a small sample of people, postulating

that the researcher can analyze the data more thoroughly, and that the data can be more valuable, when the research is rich in information.

In agreement with these findings, our own experience confirms that interviewing only a small number of volunteers, in a limited amount of time and with a small budget, helped greatly to clarify our test. All that is needed for a similar effort in support of comparable research projects is some preparation, a few hours for interviewing, and the willingness to ask students if they wish to participate.

Submitted by **Francis Howard,** *San Jose State University,* **Tom Hewitt,** MLIS, and **Tina Peterson**, *San Jose State University*