

# ONLINE KNOWLEDGE SURVEYS AS A MEANS OF LIBRARY INSTRUCTION ASSESSMENT

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During the 2005-2006 academic year, the University of University–Madison’s Memorial Library experimented with online survey software in classroom library instruction. We used the software to supplant most of our paper assessment tools and we experimented extensively with a different type of assessment tool, the knowledge survey. Knowledge surveys ask students to rate their readiness to be tested on a particular learning outcome without asking them to perform the task directly. We will discuss the use of online survey software in general and the various advantages to using this software. Finally, we will discuss in greater detail our experiments and preliminary data related to the knowledge survey tool. For this discussion, the term “survey” is used to refer to any mechanism by which to receive feedback, including comment cards, evaluations, and in-class worksheets.

## ONLINE SURVEY SOFTWARE

For the software, Memorial Library chose to use WebSurvey, a product developed by the Division of Information Technology (DoIT) at the University of Wisconsin–Madison and only available to the faculty and staff at UW–Madison. However, we did examine other commercial products, such as SurveyMonkey, Zoomerang, and Survey Solutions Express, and found their feature lists and capabilities consistent with WebSurvey.

The technical components of creating a survey are only slightly more complicated than creating a comparable paper version. There are essentially four steps in creating a survey using any of the mentioned survey products. First, give a name to your new survey. Second, begin to add or edit questions to the survey; all of the software provides avenues for multiple choice, true-false, rating scales, and open-ended questions. Also, many software packages provide a means of customizing the look of your survey by either

allowing HTML coding within pages or questions, or by providing templates. At Memorial Library, we added screen capture images to some questions in order to provide contextualization. The third step is to deploy the survey as a static URL link. The final step is to analyze your results. Within the software, most products provide not only a means of collating the data, but representing it visually using charts and graphs.

## ADVANTAGES

Because of its functionality, the online survey software can be used as a low-cost alternative to personal response systems, or clickers, and the advantages are parallel. First, the software encourages all students to engage with materials by demanding that they interact with the session’s content. It also encourages full participation in activities and diminishes individuals’ tendencies to defer to more active learners in the class. Our classes were small enough that students were able to individually take surveys, which created a built-in time during the session for students to process content without interference from instructors. As another advantage, the anonymity of the surveys provides a safe environment for students’ input without the threat of public conflict. We believe the surveys we administered were an accurate reflection of a class’s overall aptitude, ability, and opinion. Therefore, we experimented with tailoring sessions on-the-fly to students’ knowledge and desires as the survey results unfolded. This meant that often our structures and outlines for a session were tentative and depended upon our surveys as blueprints for parts of the session. The functionality of visually representing data in charts and graphs allowed us to present the results to classes while they were still in progress, allowing us to create “teaching moments” within a session.

For a Psychology 411 class during the fall semester, we mapped nine different activities and matched them to specific survey questions. Upon administering the survey at the beginning of class, we examined the results immediately and then proceeded to cover the most appropriate activities. In theory, this meant that

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students would get the information they needed most and place them in the center role of choosing the content. In practice, it meant that librarians needed to work outside of comfort zones and in opposition to traditional working assumptions. For example, in the above class, we found that students were more concerned with evaluation, analysis, and the process of making accurate judgment calls regarding information, rather than the actual search techniques that we were more accustomed to teaching.

Beyond the classroom, there were also administrative advantages to using online survey software: it was easier to collect and tabulate data. We were able to emulate common worksheets online and capture the information, and with an in-class printer, still allow students to leave with their work in hand. Additionally, the intermediate step of converting data into an electronic format was already done for us. Even better, if the survey was mechanically scoreable, the results were tabulated immediately.

### **SURVEY EXAMPLES**

One final advantage was the sheer versatility of the software to emulate all forms of paper feedback. This ranged from comment cards to our experimentation with knowledge surveys. One example of how we used the software was to replace comment cards we had students complete at the end of a session. Instead of distributing index cards, we directed students to a website with an embedded link to the same open-ended questions, and at the end of a session we asked students to fill out the website “survey.” For a second use, we emailed evaluation forms to teachers as a website link to assess their satisfaction with the library session. We also emulated in-class exercises or worksheets during sessions using the software. For example, we used it to develop open-ended short essay questions and had students complete the questions as part of a classroom activity. As another in-class example, we also converted paper search strategy worksheets that helped students constructively build search statements. For a fourth type of use, we emulated personal response systems by asking questions that determined session content; in one class we simply asked whether students preferred us to cover the mechanics of searching or techniques for evaluating sources. Finally, we used the online survey software to conduct pre- and post-testing of skills, knowledge, and confidence related to information literacy. Consequently, we began to experiment extensively with knowledge surveys, as opposed to more traditional, performance-based tests.

### **KNOWLEDGE SURVEYS**

Knowledge surveys, developed by Edward Nuhfer and Delores Knipp (2003), are a pre- and post-class assessment tool based on self-efficacy theory, the idea that a student’s judgment of their own capabilities in a subject area will make it more likely that the student will perform at a higher level on tasks related to the subject. Therefore, the knowledge survey does not test concrete knowledge or performance, but indirectly measures student learning by evaluating confidence levels. Knowledge surveys are designed around learning outcomes, allowing instructors to create a comprehensive assessment that addresses all areas of expected

knowledge in a subject. The questions are often linked with Bloom’s Taxonomy (see Table 1), allowing granularity that addresses all levels of learning equally, although the nature of some disciplines may require a more disproportionate number of factual, analytical, or evaluative questions. Creating questions for a knowledge survey is simple because they can be the same questions instructors use to test performance; often survey questions come from old tests, quizzes, and homework assignments.

**Table 1 (Bloom, 1984)**

#### **Bloom’s Taxonomy**

<b>Competence</b>	<b>Verbs</b>
Knowledge	defines, identifies, recalls
Comprehension	describes, discusses, explains
Application	applies, demonstrates, uses
Analysis	analyzes, compares, distinguishes
Synthesis	constructs, creates, formulates
Evaluation	assesses, evaluates, selects

Using knowledge surveys as an assessment tool has many advantages. Knowledge surveys are quick and easy to create, especially with the use of online survey software, which also allows instructors to quickly score and analyze results. The surveys are designed to indirectly evaluate student learning, serving as an immediate indicator of students’ strengths and weakness and allowing for a more tailored learning experience. They also serve as a blueprint for students, clearly laying out the competencies they are expected to learn from the class. Just as importantly, knowledge surveys serve as an assessment measure for teaching effectiveness. Because knowledge surveys rely on defining and teaching to learning outcomes, low confidence ratings may indicate that the material was not sufficiently covered during class time. This also speaks to the fact that knowledge surveys are more objective than other common assessment tools used for library instruction, such as the instructor evaluation or one-minute essays, which may not get at the heart of what students learned, but instead may address more subjective factors such as the teacher or the classroom conditions. Finally, knowledge surveys, when compared to performance testing, allow for instructors to more easily ask questions addressing the higher-order thinking skills, such as evaluation and synthesis, without a significant time strain on students or instructors.

### **KNOWLEDGE SURVEY ENGLISH 168 RESULTS**

Beginning in the fall of 2005, Memorial Library tested knowledge surveys as an assessment tool for library instruction sessions. The nature of library instruction, with classes typically meeting once for 50 minutes, required the comprehensive design of the knowledge survey to be adapted. Library instruction sessions were designed with two to four learning outcomes, which were addressed during the session through lecture and hands-on activities. These learning outcomes were evaluated with knowledge surveys at both the beginning of class and the end of class in order to measure a student’s change in confidence levels following

instruction. Questions were designed around Bloom's Taxonomy to address both the lower-order skills, such as identifying call numbers or using journal databases, and the higher-order skills, such as formulating search strategies and analyzing search results. We also chose to test students on performance questions related to the learning outcomes in order to corroborate our knowledge survey data.

During the spring semester, the knowledge survey was administered to four library instruction sections of an English 168 class (see Figure 1), for which students were working on a historical paper. The students were expected to walk away from the library instruction: (1) knowing the best journal databases for their topic; (2) understanding and using the online

library catalog; (3) formulating effective search strategies; (4) understanding how to limit or expand searches; and (5) knowing where to begin their research. We addressed these learning outcomes through discussion as well as 20 minutes for the students to work hands-on researching their topic. The pre-evaluation asked five knowledge survey questions and five correlating performance questions, as well as two additional queries that would allow us to look at different subsets of our students: 'Do you have your paper topic selected?' and 'Have you been through a library instruction session for another class, either this semester or in previous semesters?' The post-evaluation asked the same five knowledge survey questions, but a different set of five performance questions that addressed different aspects of the learning outcomes.

**Figure 1**

**English 168 Knowledge Survey**

**Instructions**

This is a knowledge survey, not a test. The purpose of this survey is to help examine your understanding of information sources and library services based on the expectations of the University of Wisconsin-Madison and the UW-Madison Libraries.

Read each question carefully. Please do not actually answer these questions. Instead, rate your confidence to answer these questions with your present knowledge, using the scale below:

**Mark an "A"** if you feel confident that you can answer the question right now for graded test purposes.  
**Mark a "B"** if you can make an educated guess for the answer right now for graded test purposes.  
**Mark a "C"** if you are not confident that you could sufficiently answer the question right now for graded test purposes.

1. Know where to begin research on your topic.  
A\_\_\_                      B\_\_\_                      C\_\_\_
  
2. Conduct a search in MadCat to find materials on your topic.  
A\_\_\_                      B\_\_\_                      C\_\_\_
  
3. Select the best library database/search engine to find journal articles on your topic.  
A\_\_\_                      B\_\_\_                      C\_\_\_
  
4. Formulate a search statement for your topic.  
A\_\_\_                      B\_\_\_                      C\_\_\_
  
5. Name ways to limit your search statement if your original search returned too many results.  
A\_\_\_                      B\_\_\_                      C\_\_\_

Results from the English 168 sample showed that during the pre-evaluation, students' estimation of their skills were almost on par with their performance, with an average confidence level of 57.6% and an average performance level of 52.2%, a difference of 5.2% (see Figure 2). During the post-evaluation, students rated themselves extremely confident, averaging 93.6%, but their performance only averaged 62.4%, a difference of 31.2% (see Figure 3). These numbers indicate that while both confidence and performance have increased, students are over-confident following library instruction sessions. Data also indicates that students who had previous library instruction sessions perform better on the pre-evaluation, but are equal with their peers for the post-evaluation. Surprisingly, the students who had already had topics selected, who would have had more opportunity to apply the concepts learned during class, did not perform better in the post-evaluation than students who had no topic selected.

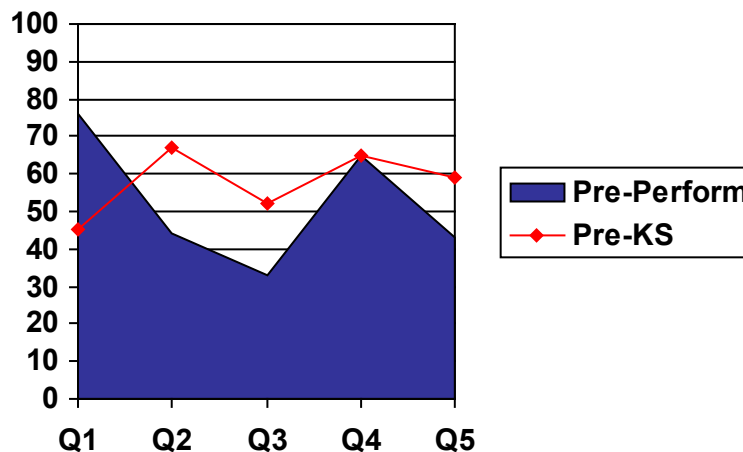
It isn't yet clear what these results mean. It may be the case that the difference in post-confidence and performance is an indicator of students' lack of ability to apply knowledge to new situations. It could also be an error in the construction of the performance questions if the content wasn't sufficiently covered during the library session. In

either case, the knowledge survey data is useful because it still gives direction for the improvement of future sessions: focus on application and the transferability of knowledge.

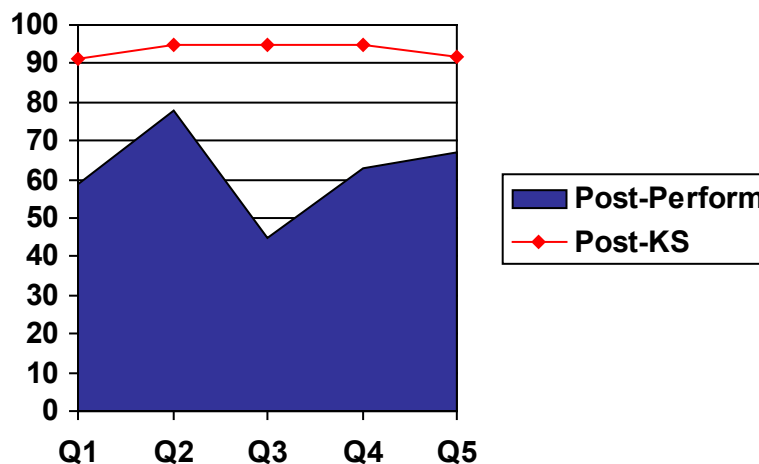
## CONCLUSION

In conclusion, we found online survey software to be a dynamic alternative to paper assessment tools as well as a low-cost alternative to personal response systems. The software allowed us to engage students and encourage full-participation in the sessions, as well as giving us the opportunity to immediately assess students' strengths and weaknesses and tailor classes on-the fly. Knowledge surveys are a quick and easy assessment tool that has allowed us to evaluate the divide between student competency and student confidence, which furthers our understanding of student learning in library instruction. We also found that by using knowledge surveys in conjunction with the survey software, we increased our ability to assess often un-assessable content, getting at the higher-order thinking skills. Our preliminary experiments with knowledge surveys and online survey software have opened the door to further investigations.

**Figure 2: Pre-test for English 168**



**Figure 3: Post-test for English 168**



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