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Usability Evaluation of an Online Media Resource Guide

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This study used a survey research design to evaluate the effectiveness, efficiency, satisfaction, credibility, and therefore, the overall usability of CottonLink, an online media resource guide as determined by members of the Texas Plains region associated press medium. Using a modified version of Dillman's (2000) Tailored Design Method, the response rate reached 54.2%, with a total of 39 completed online surveys. The researcher designed instrument achieved acceptable reliability scores for each portion of usability: effectiveness ,0.95; efficiency,0 .98; satisfaction, 0.92; credibility, 0.92; and overall usability, 0.97. Respondent's found the Web site to be effective, efficient, satisfying, credible, and usable. Findings were relevant for both researchers and practitioners. Future research should evaluate terminology related to usability test actual agriculture knowledge and experience, analyze usability qualitatively, and replicate this study with a larger population. Recommended practices for practitioners include continually develop usable educational resources for media members, extend media resource guides for additional commodities and states, and hold training workshops for both media and industry representatives.

Introduction

Agricultural issues are becoming increasingly complex, combining one of the oldest industries with some of the newest technologies. Journalists face time and knowledge challenges when reporting on technical or scientific issues, often being "overwhelmed by their complexity" (Whitaker & Dyer, 2000, p. 125). In addition, journalists are developing into generalists. They are expected to cover a greater number of beats, whether or not they are trained or familiar with the subject matter (Voss, 2003). Therefore, they rely heavily on various news–gathering techniques where new technologies affect the way business is done and information is distributed. One of the important techniques for gathering news and information about agricultural industries has been the use of the Internet. However, there have been questions related to how 'usable' Web sites are (Nielsen, 2000). This study analyzes the usability of a Web site devoted to issues related to the cotton industry. Specifically, this study examined a variety of objectives related to the usability of CottonLink, as well as credibility, of this Web–based resource by professional journalists.

Previous studies on the Texas print media's coverage of cotton and the impact of the media resource guides indicated a level of bias, which decreased after the release of an earlier version of the cotton media resource guide (Beesely, 2003; Vinyard, 2004). Whitaker and Dyer (2000) found that journalists did little to establish new and better sources of information, as evident in Hein's (2005) study that discovered a majority of the reporters were simply not utilizing the cotton media resource guide. Likewise, Wright (2001) found increased information and new technologies have strengthened personal and professional relationships between journalists and public relations professionals. Computer mediated communication is now acceptable and used to build relationships. The Internet has become the most accessible and abundant source of

information available. The Internet provides the public relations industry with a stimulating communication medium that offers an unlimited potential for message or information dissemination (Wright, 2001).

To further refine public relation practices and improve the media's coverage, it is imperative to understand the tools media members employ to gather information and how to maximize the tool's usefulness. During the information age, options for information sources are abundant and can serve the exact needs of the media (Hein, 2005; Wright, 2001). Providing the media with credible and knowledgeable sources eliminates work for the journalist and allows the journalist to focus on writing an accurate article. Current technological trends lead toward the use of the Internet and online news gathering techniques to provide the media with the most informative, accessible, and customizable information (Callison, 2003; Hein, 2005). Successful media resource tools must empower the audience with a usable, credible, informative, accessible, and customizable source of information.

According to Nielsen (2000) and Krug (2000), all Web sites must be evaluated on their ability to meet or not meet a variety of usability standards. The Web provides users with opportunities to achieve certain information–seeking goals and is "the ultimate customer–empowering environment" (Nielsen, 2000, p. 9). Web site usability could be the difference between achieving the site's goal and creating a negative image for an entire industry (Donahue, Weinschenk, & Nowicki, 1999). The conceptual framework developed for this study used the review of literature to refine Nielsen's (1993) approach to understanding general usability to specifically focus on Web site usability. His general approach provided a basic model for evaluating and defining usability. This study concentrated on satisfaction, errors, memorability, efficiency, and learn ability as factors contributing to Web site usability.

Although usability studies don't measure source credibility, increases or decreases in usability might impact the perception of a website's credibility. A website, like any other communication channel, delivers a degree of medium credibility. Medium credibility focuses on the channel that delivers the content rather than the source of the content (Kiousis, 2001). As far as medium credibility is concerned, information received from the Internet is perceived as credible as information delivered from any other mass communication medium and in some cases, even more credible (Wright, 2001). Wright found government and educational sites have established a reputation of being highly credible. Commercial and organizational sites have received more scrutiny and are generally viewed as biased; however, these sites are frequently used to gather opinion information.

Medium credibility directly correlates with source credibility (Kiousis, 2001). Kiousis defined source credibility as examining how communicator characteristics, whether that be an individual, group, or organization, can influence the processing of the message. Therefore, the individual characteristics of each Web site and the information available from it combine to formulate the perceived source credibility.

The contributing factors of usability and credibility determine the initial worth of the site and the extent to which online media resource guide could be valuable for the intended audience. Evaluating the use of online resource guides as a news–gathering technique for the media provides meaningful information on the format, content, and value of information provided to the media online.

Purpose

The purpose of this study was to determine the usability of an online media resource guide for members of the region's print media. The following objectives were developed to carry out the purpose of this study:

1. Determine the effectiveness of the online media resource guide for members of the Texas print media in the Plains region.
2. Determine the efficiency of the online media resource guide for members of the Texas print media in the Plains region.
3. Describe the Plains region members' of the Texas print media satisfaction with the online media resource guide.
4. Describe the credibility of the online media resource guide as perceived by members of the Texas print media in the Plains region.

Methodology

Design

A Web–based survey research design was used for this study, which Fraenkel and Wallen (2006) described as asking questions to collect information from a specific group of people in order to describe characteristics of a population. Specifically, a cross–sectional survey method was used to evaluate the effectiveness, efficiency, satisfaction, and credibility of online media resource guide at just one point in time from a predetermined population (Fraenkel & Wallen, 2006). Because the objectives of the study were related to the usability of a Web–based resource, newspaper journalists were identified as the primary target audience.

Population

As seen in Figure 2, the Plains, Coastal, and Greater Texas regions were established as working zones to define the concentration of cotton production. The Northwestern portion of Texas makes up the Plains region and contains the highest concentration of cotton production in the nation. The Plains and Coastal regions consist of heavily concentrated cotton production, while the Greater Texas region represents the portion of the state with sparse cotton production.

Krug (2000) advised using the target audience of the Web site to test the usability of the site so their needs are determined and met through the testing. To do so, this study's population, consisting of members of the Texas newspaper industry within the Plains region, was established by cross–referencing the online membership roster of the Texas Press Association with the county lines. The Plains region, consisting of 66 counties and 88 newspapers with membership to the Texas Press Association as of January 2006, was identified as the purposeful target population. Schutt (2006) indicated that "in some circumstances it may be more feasible to skirt the issue of generalizability by conducting a census – studying the entire population of interest – rather than drawing a sample" (p. 138). Therefore, the target population for this study was a census of the 88 newspapers in the Plains region.

Nielsen, Coyne, and Tahir(2001) suggested making personal contact after selecting the population. An effort was made to contact each of the 88 newspapers by phone, and in order to identify the most likely person at the newspaper to use the media resource guide, the data collector asked for an available editor or someone who would deal with agriculture reporting to participate in the study. After soliciting voluntary cooperation, journalists were asked to participate in the Web–based survey. Due to closed newspapers and newspapers operated by the same individual, the population was reduced to 84 newspapers. Twelve newspapers refused to participate in the study, reducing the accessible population to 72 newspapers. The number of respondents totaled 39, a response rate of 52.4 percent.

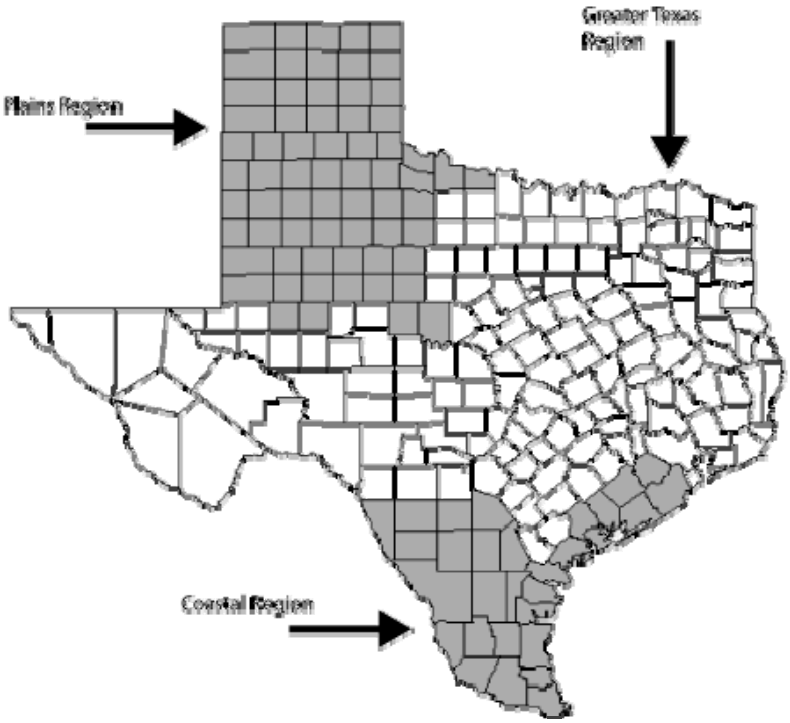

Figure 2. Primary cotton producing regions of Texas (Doerfert, Beesley, Haygood, Akers, Bullock, & Davis, 2004).

Instrumentation

This study used a researcher–designed instrument consisting of an online survey questionnaire. Zoomerang.com was used to develop and host the survey instrument. The researchers built the instrument with four sections. Section one gathered data related to participants' current status and needs for reporting, which is not reported in this paper. Sections two and three contained Likert–type scale questions. A four–point scale was used to measure the strength of agreement: 1=strongly disagree, 2= disagree, 3= agree, and 4= strongly agree. This measurement was also coded as scale type data, assuming that each measurement fell between 1 and 4.

Section two of the study contained the task performance portion of the instrument where participants were asked to open the media resource guide Web site in a new window and take a couple of minutes to explore the site and focus on the contact directory, photo gallery, and e–lert system before returning to complete the survey. This information is not reported in this paper.

Because usability is the degree to which a product is effective, efficient, and satisfying for those who use it (Usability Professionals' Association, 2005) and credibility heavily influences news gathering techniques, the third section of the instrument contained statements tied to the categories of effectiveness, efficiency, satisfaction, and credibility. Statements were adapted from usability instruments developed by Axtell (2006) and Palmer (2002) along with related literature from Nielsen (2000) and Krug (2000).

Nielsen (2000) deemed site design as the most important factor when evaluating usability. Within this study, site design was heavily tied to the effectiveness category. Cato (2001) defined effectiveness as the amount of user effort required to achieve the user and domain goal. Questions within the effectiveness section were related to page organization, site organization, navigation menus, downloadable documents and links, and achieving their goal with the site.

On the other hand, content is the primary reason users go to a site (Nielsen, 2000). This study defined efficiency as the accuracy and

completeness the user achieves with respect to the goals (Cato, 2001). Therefore, the efficiency section dealt with the quality of information, the ability to understand the material presented, the availability of contact information, and the overall presentation of information.

As with any type of communication, satisfaction is key to developing return users. In the satisfaction category, the usefulness of the site, download/upload speed, amount of user interaction, site aesthetics, and overall feeling of satisfaction were rated.

The credibility category specifically asked the subject to rate how likely they would be to browse the site again, if the site enhances their ability to cover cotton, the likelihood they would recommend the media resource guide to colleagues, and if the site portrayed the media resource guide as a credible source.

Dillman (2000) found respondents are more likely to complete surveys when demographics are not at the beginning; therefore, the final section of the instrument collected demographic information. This information is not reported in this paper.

Validity and Reliability

Threats to validity fall into two general categories: internal and external. For this study, external validity was not a threat because this research was not generalized to other populations. The study's internal validity was controlled by using only one data collector and by obtaining specific information about the subjects' demographics and location. Because the cross–sectional survey collects information at only one time, history, mortality, and maturation were not threats to the study.

Fraenkel and Wallen (2006) identified mortality, location, instrumentation, and instrument decay as the primary threats to internal validity of survey research. Fraenkel and Wallen recommend holding the location constant as the best method of controlling location threat. Because the purpose of the media resource guide is to assist the media with reporting on cotton, subjects completed the survey in their typical working conditions – a realistic setting for the use and purpose of the media resource guide. Because research shows the type of Internet connection to influence user satisfaction, respondents were asked the type of Internet connection used when completing the survey. This allowed researchers to account for variations in processing speed and analyze the impact Internet connection has on usability to minimize location as a threat. Because participants were able to set their own pace, instrument decay was not considered a threat.

Through the use of a pilot test, instrumentation error was minimized as a threat. The pilot test also helped determine if the questions were easy to understand while testing the reliability and validity of the instrument. The instrument was pilot tested with Coastal region newspapers because this population is similar to the target population. There are 58 newspapers in the Coastal region, and 38 consented to participate in the study. Data collected from the 21 pilot test responses were analyzed for reliability.

The Cronbach's Alpha for effectiveness was 0.59, 0.49 for efficiency, 0.72 for satisfaction, and .79 for credibility. While the Cronbach's Alpha for effectiveness and efficiency were low, Nunnally (1967) suggested .5 could be considered adequate during early research stages or with new instrument development. However, adjustments were made to the effectiveness and efficiency categories using comments and suggestions from the pilot test respondents to increase the reliability. A reliability test was repeated with data from the actual population, which was more cohesive and realistic. The Cronbach's Alpha for each category greatly increased from the pilot test scores (Table 1).

Table 1
Comparison of Instrument Reliability Scores

	Cronbach's Alpha	
Category	Pilot	Post Hoc
Effective	0.59	0.95
Efficient	0.49	0.98
Satisfaction	0.72	0.92
Credibility	0.79	0.92
Usability	0.93	0.97

Data Collection

In Dillman's (2000) Tailored Design Method for Internet surveys, he recommends the use of a five–contact model, including a prenotice letter, the questionnaire, a reminder, a second questionnaire, and then invoking special procedures, during a five–week period of time. In order to meet the needs of this study, a modified version of Dillman's Tailored Design Method was used. Five contacts, using phone and e–mail communication, were made to the sample during a two–week period. Responses of early and late respondents were compared, yielding no significant differences.

Findings

Thirty–nine respondents participated in the study and provided their answers to the questionnaire. A majority of these respondents were female (55%) and almost half indicated they had a college degree. The average age was 46.4 (*SD* = 13.2) and had an average time spent in their profession of 14.4 years (*SD* = 11.5). As a profession, the profile of the respondents included 64% editors and 21% as reporters. Finally, the respondents were asked to provide their opinion about how much knowledge and experience in agriculture they had. Using a 1 to 10 scale where a "1=None" and a 10=Extensive," overall knowledge of agriculture rated 5.1 (*SD* = 2.5) and agricultural experience rated 4.1 (*SD* = 2.6).

Effectiveness

A series of seven individual statements was used to gauge the effectiveness of the online media resource guide (Table 2). All responses in section three of the instrument were based on a four–point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. Out of the seven individual statements, "Overall, this Web site's navigation was effective" had the highest mean score (*M* = 3.44). Nielsen (2000) identified navigation as a "necessary evil" and heavily related to effectiveness (p. 18). Therefore, the final individual statement in this section, 'Overall, this Web site's navigation was effective,' was included to summarize the effectiveness in the subject's mind. Responses were consistent with the other effectiveness statements, adding validity to the individual statements and their relevance to effectiveness. Interestingly enough, the statement with the lowest mean score (*M* = 3.14) for the effectiveness series and the entire section three of the instrument also contained the word "effective." The mean score for the seven individuals was 3.32 (*SD* = 0.56). Researchers were confident in the findings and determined users felt the CottonLink media resource guide was effective.

Table 2
Effectiveness Objective

Statement	*M*	*SD*	Mode
Overall, this Web site's navigation was effective. (*N* = 36)	3.44	0.60	4
The Web site menus assisted in navigation. (*N* = 37)	3.38	0.55	3
The Web pages were clearly organized. (*N* = 37)	3.37	0.59	3
Information on the pages was clearly organized. (*N* = 37)	3.32	0.58	3
Links and downloadable documents were predictable and clearly recognized. (*N* = 37)	3.30	0.70	3
I never felt lost on this site. (*N* = 37)	3.27	0.80	3
I effectively achieved what I wanted from this site. (*N* = 36)	3.14	0.64	3
Total Mean Score for Effectiveness (*N* = 37)	3.32	0.56	3

Note. Responses are based on a four–point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

Efficiency

In a similar fashion, six individual statements were rated to determine the perceived efficiency of the media resource guide (Table 3), which dealt heavily with the presentation and quality of information presented in the site. The statement, "Contact information was provided," had the highest mean score (*M* = 3.43), with the overarching statement. "Overall, this site provided information efficiently," coming in close behind with a mean of 3.42. The total mean score of 3.36 represents the mean score of the six individual statements, indicating that respondents agreed the site was efficient. Additionally, the standard deviation and range of mean scores remained low in the efficiency series. This consistency added validity to assessment that respondents felt the site was efficient in presenting information.

Table 3
Efficiency Objective

Statement	*M*	*SD*	Mode
Contact information was provided. (*N* = 37)	3.43	0.55	3
Overall, this site provided information efficiently. (*N* = 36)	3.42	0.60	3[a]
The information was current and up–to–date. (*N* = 36)	3.36	0.54	3
The information was easy to understand. (*N* = 36)	3.36	0.54	3
The amount of information displayed on the screen was adequate. (*N* = 37)	3.35	0.59	3
The site offered quality information. (*N* = 37)	3.30	0.57	3
Total Mean Score For Efficiency	3.36	0.56	3

Note. Responses are based on a four–point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.
[a] Multiple modes were present and the smallest value is shown.

Satisfaction

Table 4 shows the rating for the six individual statements related to satisfaction and the total mean score of 3.32. For measuring satisfaction, the highest mean score (M = 3.49) was for the 'Overall, I was satisfied with the online media resource guide' statement. This statement also had the lowest standard deviation (SD = 0.51), indicating the least discrepancy between respondents. Additionally, there was a significant gap between the top four and the lowest two individual statements.

Table 4
Satisfaction Objective

Statement	*M*	*SD*	Mode
Overall, I was satisfied with the online media resource guide. (*N* = 35)	3.49	0.51	3
The design was aesthetically pleasing (*N* = 36)	3.44	0.60	4
Web pages loaded at an acceptable speed. (*N* = 37)	3.41	0.60	3
This Web site provided significant user interaction. (*N* = 35)	3.40	0.55	3
I found this site very useful. (*N* = 37)	3.19	0.78	3
I feel this site could greatly improve the quality of my task. (*N* = 37)	3.16	0.80	3
Total Mean Score For Satisfaction	3.32	0.57	3[a]

Note. Responses are based on a four–point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.
[a] Multiple modes were present and the smallest value is shown.

Credibility

The credibility series included four individual statements (Table 5). Again, the overarching statement, "Overall, this site portrayed the online media resource guide as a credible source," rated the highest mean score (*M* = 3.54) in the credibility series and the entire section three of the instrument. The credibility series had "Strongly Agree" as the most frequent answer on three of four individual statements with a total mean score of 3.41.

Table 5
Credibility Objective

Statement	*M*	*SD*	Mode
Overall, this site portrayed the online media resource guide as a credible source. (*N* = 37)	3.54	0.51	4
I would recommend this online media resource guide to my colleagues. (*N* = 36)	3.50	0.56	4
I feel this site enhances and enables my ability to cover the cotton industry. (*N* = 36)	3.44	0.56	3
I intend to browse this Web site again in the future. (*N* = 35)	3.27	0.84	4
Total Mean Score For Credibility	3.41	0.59	4

Note. Responses are based on a four–point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

Conclusions

Nielsen (2000) and Krug (2000) agreed Web sites must be constantly updated and revised. They also discussed Web site memorability and how the user should not have to relearn the site upon reentrance after a period of time. However, CottonLink users were primarily first–time users and, therefore, started this usability analysis with an unbiased impression. If more users would have visited the site prior to the survey, it would be beneficial to determine the relationship between frequency of use, awareness of CottonLink, and usability of the Web site. Future analyses should take familiarity with the site and awareness of the organization or project into consideration when evaluating usability.

Usability testing should be done constantly from the beginning stages of site development (Bickner, 2004; Cato, 2001; Krug, 2000; Nielsen, 2000; and Spool, Scanlon, Snyder, Schroeder, & DeAngelo, 1999). However, the

style of testing and subjects should change depending on the stage of development. The first type of testing should be heuristic evaluation (Nielsen, 1993). Heuristic evaluation will eliminate many design flaws and functionality errors found in the Web site. When conducting research in the beginning stages of development, a smaller group of individuals would be evaluated using qualitative research methods in order to gain richer data. Bickner (2004) recommended watching a first–time user visit the site and qualitatively recording their thoughts, suggestions, and difficulties. The task–performance style of testing would be implemented to ensure individuals were given the same opportunity and level of difficulty. Subjects would still complete a shorter survey to gather data related to demographics and the components of usability. The qualitative data would then be cross–referenced with the survey data to evaluate the richness and accuracy of data found.

Usability testing should be conducted periodically after the launch of the site (Krug, 2000; Nielsen, 2000). The next usability testing for CottonLink should be conducted in six months after extensive promotion within the cotton industry and toward media members. A replication study could be conducted to compare findings, but members of the print media from the Greater Texas region should be included. Members of the print media in the Greater Texas region were not included in this study but would add value to the next study as it is a non–cotton producing region with a larger population. The region largely impacts the agenda, and CottonLink must show them the value of the resource for non–production areas. In this study, researchers would have liked to run more extensive statistics; however, the size of the population limited the impact of the analysis. Future research with the larger population would enable researchers to look into path analysis and cross tabulations.

Looking back at Nielsen's (1993) general model of usability, future studies should incorporate and analyze the utility branch as well. The utility branch deals with the value of the media resource guide and what kind of importance users place on the system. By determining the importance and value the intended users place on the tool, researchers could continue to develop the portions users found the most value in and reduce the amount of time and effort spent on portions of low value. Within the task performance of the instrument in this study, researchers asked the user to look at the e–lert system and then follow up with a yes–or–no question asking them if they would like to subscribe. 78.9% of respondents chose to subscribe, eight respondents chose not to subscribe, and four did not find it useful. Further research on the utility of the CottonLink media resource guide could explain why respondents opted not to subscribe even though they felt it was useful.

Better information sources and promotion will aid journalists who do desire new and improved sources of information. If practitioners can ease this process by providing a reliable and usable resource, journalists will likely spread the word to their colleagues. In this study, 97.2% of respondents agreed or strongly agreed that they would recommend this site to their colleagues. Agricultural commodities could greatly benefit from the addition of an industry–wide media resource guide and could work together to gain a strong reputation amongst journalists. One respondent in this study even made the comment, "Wow, I wish the beef and peanut industry did this." Because many of the respondents were first time users it is recommended to follow up and see if the site continues to satisfy the need of the user.

The Internet has become a housing facility for information, allowing easy distribution and updating in a readily accessible format. Utilize the Internet as just that, a housing facility for information. It should not be the only form of communication but should supplement all other forms. Media resource guides for commodities should serve as a clearing house of information related to the topic. It should include an overview and facts, directory of available sources, statistics and figures, photographs, industry practices, and above all else, localized information. Users are able to filter through what they do not want and retrieve the desired good when Web sites are properly developed and highly usable. It should also be noted younger generations utilized the Internet more often, for more purposes, and for greater lengths of time (Madden, 2006). So as younger generations replace those older generations in the media, public relations will have to adjust to meet the needs of the younger audience by using

new mediums such, as the Internet, more effectively. The context of the media should relate specifically to the changing trends of the audience. As time goes by, the audience is more and more familiar with the Internet and developing technologies.

Callison (2003) found journalists demanded unique, multimedia, content–rich news and information they can access in a timely manner, and a usable format. When respondents identified topics they would like to see in a media resource guide, 48.7% answered "no" to expert sources. However, the breakdown of time spent news gathering found in this study shows a majority of time being spent on personal interviews, press releases, and telephone calls. The CottonLink media resource guide was designed to make each of those a less time consuming process for the journalist. Future promotion should be done to illustrate all of the benefits found in the media resource guide and how it assists various aspects of the newsgathering process. Prior to answering this portion of the instrument, 78.9% of respondents had not visited the CottonLink Web site. With proper promotion and continued updates, journalists should come to expect media resource guides to assist them in all aspects of newsgathering.

The terminology associated with usability and Web sites trouble the industry. Researchers recommend in–depth studies on the wording choices and what Web characteristics apply to the specific terminology. Research could implement a correlational research design and determine the relationship between the individual set of statements and the overarching statement related to the term. Another, maybe simpler, option might be to jumble the individual statements and not list in category sections. This could encourage respondents to thoroughly think out each response and reduce the likelihood of simply producing socially acceptable responses. Researchers would then code the individual statements into categories and run reliability tests to determine if the statements were reliable when coded into categories. By conducting this research, future usability analyses could establish consistency and uniformity throughout the profession.

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