

Journal of Applied Communications vol. 95(2) Full Issue

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Recommended Citation

Telg, Ricky (2011) "Journal of Applied Communications vol. 95(2) Full Issue," *Journal of Applied Communications*: Vol. 95: Iss. 2. <https://doi.org/10.4148/1051-0834.1181>

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Journal of Applied Communications vol. 95(2) Full Issue

Abstract

Journal of Applied Communications vol. 95(2) - Full Issue

ISSN 1051-0834 ©
Volume 95 • No. 2 • 2011



**Journal of
Applied Communications**

*Official Journal of the Association for Communication Excellence
in Agriculture, Natural Resources, and Life and Human Sciences*

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An Approach to Measuring the Impact and Effectiveness of Educational Science Exhibits

Mark Tucker, Jon Bricker, and Alexandria Huerta

Abstract

Exhibits are among the oldest educational media still in wide use today, and they continue to serve a particularly important role in a range of Extension and nonformal science communication settings. While agricultural and applied communicators have an established tradition of evaluating various information channels and media, there is very little published work in the discipline that describes procedures for measuring the performance or impact of educational exhibits. Evaluation is often complicated by the placement of educational exhibits in unique venues such as fairs and shopping malls that may not lend themselves to conventional research procedures or learning metrics associated with formal education settings. This professional development paper draws from the free-choice learning literature to describe some of the special challenges that can arise in the evaluation of educational exhibits. The authors then introduce an evaluation strategy used successfully in measuring the impact and effectiveness of multiple educational exhibits over a four-year span. Developed largely from the museum-studies literature and replicated through evaluations with several exhibits, the mixed-methods strategy described here can be tailored to meet applied communicators' specialized evaluation needs and resources. Following a discussion of this approach, the authors draw on their collective experience in sharing 10 practical steps to help frame the essential phases of a successful exhibit evaluation process.

Introduction

Exhibits are among the most versatile educational media used in promoting science communication today, reaching thousands of youth and adults in a diverse range of venues that may include schools, fairs, shopping malls, museums, science centers, and other settings (Caulton, 1998). Owing to advances in materials construction and communications technology, modern educational exhibits are increasingly lightweight and durable, and they offer options for multimedia capability, computer games, and other interactive features (Macdonald, 2011; Lorenc, Skolnick, & Berger, 2007).

Although widely used in communicating science and technical information to various audiences, educational exhibits have received very little attention in the agricultural and applied communications literature, particularly in terms of measuring their educational impact or effectiveness. This void in the literature is surprising, given the expertise and resources required to develop professional-quality exhibits as well as the discipline's tradition of critically assessing print, electronic and emerging communications media (Rhoades and Hall, 2007; Fannin, 2006; Fannin & Chenault, 2005; Wood-Turley & Tucker, 2003; Rhodenbaugh, Holcombe & Hartman, 2003; Irani, 2000; Boone, Meisenbach & Tucker, 2000; Suvedi, Campo & Lapinski, 1999).

The bulk of published research on developing and evaluating educational exhibits has been conducted primarily by science center and museum professionals whose work dates back 100 years (Hein, 1998; Bitgood, Serrell & Thompson, 1994; Miles, 1988). More recent research in this area can be accessed through a specialized field of scholarship known as free-choice learning, which involves informal learning activities initiated by and under the control of the individual learner (Falk, 2001; Martin, 2001). The concept of free-choice learning is particularly relevant when one considers the learning environment in which most educational exhibits are placed. Exhibits are typically designed with the expressed goal of attracting or luring visitors who are in charge of and actively participate in their own learning experience (Simon, 2010).

This professional development paper provides a compact overview of educational exhibits in the free-choice learning environment, followed by description of a mixed-methods approach recommended by the authors in evaluating the effectiveness of educational exhibits. The authors developed an initial exhibit evaluation approach following a review of the free-choice learning and exhibit evaluation literature. The methodological approach was successively improved by the evaluation team in assessing multiple exhibits over a four-year span. This paper describes the exhibit evaluation approach resulting from this iterative process and concludes with practical guidelines for applied communicators in tailoring an approach for their particular needs.

Educational Exhibits and the Free-Choice Learning Environment

Dating back more than a century, educational exhibits are among the oldest communication products of Land-grant universities (NPAC, 1960). Although not appropriate or practical in every educational venue or for every audience, educational exhibits have endured because of the unique experiences they can offer to visitors. Exhibits often provide textual information, but they are designed to be more than “books on walls” (Leinhardt & Knutson, 2004, p. 125). Modern exhibits can offer a multisensory environment that includes large color photos and artwork, special lighting, audio scripts, video panels, and computer games. They may offer the capability to publicly and securely display rare or unusual specimens or artifacts for public viewing and enjoyment. Importantly, visitors can often physically touch and interact with the exhibit through the incorporation of touchpads, keyboards and other special features.

Much of the literature on the history and best practices surrounding educational exhibits is located in a specialized field of education known as free-choice learning. Falk and Dierking (2000) define free-choice learning as a special type of learning in which the pupil rather than the instructor controls the learning process, including when, what, how, and how long he or she will engage in a learning experience. Compared to the more structured learning mode of the classroom, free-choice learning has been described as more of a nonlinear process that typically occurs over short periods of time and requires no prior knowledge (Bamberger & Tal, 2007). While free-choice learning is often associated with informal learning in museums and science centers, the actual range of venues is unlimited (Martin, 2001). It is a spontaneous type of learning that takes place anywhere individuals can freely access media such as books, radio and the Internet. Falk (2001) acknowledges that while formal education systems are critical to the well-being of society, individuals can and do learn much about the world and about science through a wide range of informal learning environments such as zoos, nature centers and community organizations. He calls for increased research on these venues and on educational media as potential resources to support lifelong free-choice learning.

While many communication products and media can at times be instruments in free-choice learning, educational exhibits are nearly always used in environments where the learner, not the educator, controls the learning environment. Compared to other Land-grant communication products, educational exhibits are unique in several other aspects:

- As with all educational media, exhibits must be well-designed and interesting, but unlike publications or Web sites, they cannot be saved or bookmarked for later reading or reference.
- An effectively designed educational exhibit must be capable of attracting a visitor's attention from a distance, appealing to his or her senses, and drawing that individual into a physical space that creates wonder and curiosity.
- Visitors must literally think on their feet because exhibit learning spaces are often walkways or corridors. Learning occurs as ambulatory visitors browse and move through an exhibit area.
- Individuals nearly always visit exhibits in groups, which offers potential benefits to learning because of the opportunity to ask questions, share thoughts, and discuss subject matter. Disadvantages include possible distractions to the learning process as adults watch children or carry on conversations unrelated to the exhibit.
- While they hold the potential to reach hundreds or even thousands of people, educational exhibits are not properly thought of as mass media, and there is not a well-established Land-grant tradition in assessing their performance.

Research on free-choice learning has identified a number of interesting facets relevant to applied communicators who use exhibits as educational media. Much of this work is associated with Professor John Falk of Oregon State University, whose publications represent an excellent starting point for those interested in learning more about free-choice learning (see references cited in this paper for more information). Following is a sampling of such insights:

- As additional exhibits are added in a learning space, visitors tend to look at more of them, but total time spent in the exhibit area does not increase (Hein, 1998).
- Exhibits that face each other often compete for attention, as research shows that visitors tend not to zig zag between exhibits (Bitgood, Serrell & Thompson, 1994).
- Visitors exiting an exhibit typically cannot articulate what they think they have learned. Researchers recommend that evaluators attempting to measure learning simply ask visitors to describe in their own words the main point or the major message of the exhibit (Falk & Dierking, 2000).
- In quantitative studies conducted to identify factors associated with visitor learning through exhibits, common education variables such as prior knowledge, motivation, and interest explained no more than 9 percent of the variance in learning (Falk, 2004).

Studies of exhibit visitors are unique in applied communications because they typically involve studying actual environments where learning and interaction are taking place. The live exhibit setting creates both opportunities and challenges for applied communication professionals in evaluating the educational performance of an exhibit. Opportunities arise from the authentic learning laboratory that presents itself as visitors candidly interact with exhibits – the spontaneous human interaction

and learning that take place naturally in the exhibit cannot be simulated in a laboratory. The exhibit area is, therefore, an attractive venue to measure attitudes, observe unrehearsed behaviors, and, in general, “eavesdrop” on the learning process with actual visitors.

However, practical and methodological challenges also quickly arise in the free-choice learning environment. For example, it is important to recall the fact that randomness is one of the most powerful concepts in social science research. Through random sampling, researchers are able to study smaller groups (samples) of individuals or things and make generalizations to larger groups. This is the reasoning behind public opinion polls and political election surveys that can accurately predict the attitudes or behaviors of thousands or hundreds of thousands of people based on only a few hundred responses. Generalizations can be made to a larger population only if the assumption of randomness is satisfied during sampling.

A major issue in many free-choice learning environments is that individuals who voluntarily attend museums or fairs to visit exhibits cannot be considered to be randomly assigned to this experience from the larger population. In other words, exhibit visitors may well differ from the general population and, importantly, from others who choose not to visit exhibits, but we usually do not know specifically how they differ. In short, we generally must assume that exhibit visitors who voluntarily view an exhibit may be part of a special population for which we have limited information (Crane, 1994). In those cases, we cannot assume they are randomly assigned from the general population. Results from visitor surveys, interviews, or observations must be interpreted and used with caution and typically do not lend themselves to generalizations about much larger populations such as 12- to 14-year-olds with an interest in science or single moms with limited knowledge of food safety.

Challenges also confront evaluators in using experimental design methods to measure learning from an exhibit experience. For example, consider a scenario in which an evaluator intercepts individuals directly before they enter the exhibit, administers a pre-test, and then tests the same individuals again as they exit. Presumably, any differences in paired-sample t-testing between pre- and post-test scores could be attributed at least partially to learning that has occurred in the exhibit. Challenges arising from this research approach include potentially low rates of participation from visitors who do not wish to sacrifice their leisure time by taking multiple “tests.” Because the majority of people visiting fair and museum exhibits do so in groups with family and friends (Hein, 1998), asking one individual to participate in the research inconveniences the whole group. Another potential threat to data quality is that asking individuals to participate in a pre-test potentially contaminates the exhibit experience under consideration. The phenomenon is reminiscent of the well-known Hawthorne effect, documented as far back as the 1930s, that showed individuals often behave differently if they sense they are being observed or studied. In the case of an exhibit evaluation, such an effect could alter the spontaneous learning experience that researchers are attempting to study.

Arriving at an Evaluation Solution

Despite some of the evaluation dilemmas presented by free-choice learning environments, it usually is possible to develop a research strategy to help guide practical decision-making for formative and summative exhibit evaluation purposes. Developing an appropriate evaluation strategy is all about finding the right fit for each situation that is influenced by budgets, deadlines, available personnel, and uses of the data. In formative evaluations undertaken to help fine-tune an exhibit for a particular target audience, evaluators may be able to glean useful information from observing or interviewing even a small number of visitors as they interact with the exhibit. Formative evaluations

are extremely important in making ongoing improvements over the life of a project (Crane, 1994). In summative evaluations or those needed to help inform significant decisions about future funding or activities, data requirements may well be more rigorous. In such cases, it may be advisable to collect different types of data from a larger number of visitors and to do so at several points in time.

Our approach. At Purdue University, the professionals who develop and fabricate exhibits are housed in the Exhibit Design Center, a 15,000-square-foot facility that offers studio space and specialized equipment for CAD engineering, cabinet-making, metalwork, plastic fabrication, modeling, construction, and prototyping. As a component of the Department of Agricultural Communication in the College of Agriculture (see <http://www.ag.purdue.edu/agcomm/>), the Center draws upon expertise of the unit's writers, editors, videographers, and graphic designers in developing exhibits and interactive elements.

The Center specializes in the development of two- and three-dimensional learning environments that provide informal science education and promote science literacy to local, state and national audiences. The cost of exhibits produced by the Center varies widely and can range from approximately \$2,000 to \$500,000 depending on size (square feet), use of hands-on and interactive elements, electronic technology and digital components, and special effects elements. Smaller exhibits are typically funded by Cooperative Extension while larger projects tend to be funded by faculty research grants.

Evaluation has been an integral part of the Center's development and design process since 2004. The Center's staff members are information design specialists who analyze audiences, develop learning objectives, and collect evaluation data for educational exhibits they create. In 2006, the Center's coordinator formed an evaluation team to focus on a particular exhibit developed in the previous year – a 500-square-foot multimedia exhibit titled “Nano in Your Neighborhood” focused on nanotechnology education (Figure 1).

Figure 1. “Nano in Your Neighborhood” Exhibit at the Indiana State Museum



The evaluation team included exhibit designers and writers, as well as a faculty member and graduate students from the academic Agricultural Communication Program. The team set up regular meetings to discuss data needs, resources and steps required to launch an evaluation program. A literature review was undertaken to learn more about exhibit evaluation methodologies that have been used in the free-choice learning environment. Figure 2 provides a listing and short description of some of the most common evaluation methodologies discovered through this process.

Figure 2. Common Evaluation Methodologies Used in the Free-Choice Learning Environment

- ❑ **Meso-genetic method:** Keeping of detailed notes to document the evolution of the exhibit through its various life phases. Ongoing notes are made in response to content and design changes in the exhibit as well as their consequences, much like a journal or diary.
- ❑ **Visitor observation:** Visitors' routes are tracked through the exhibit and recorded on special maps, along with information such as time spent in the exhibit, interaction with the exhibit, and obvious visitor characteristics such as sex, approximate age, and presence of children or other adults in the group.
- ❑ **Survey techniques:** Survey strategies can include comment cards or questionnaires in which visitors provide written responses to questions about the exhibit, levels of interest in the subject, and possible future behaviors. Demographic variables such as sex, age, and level of education are also included.
- ❑ **Experimental designs:** An evaluation method that typically involves testing of subjects' knowledge or awareness before and at one or more points after exposure to an exhibit or other treatment. Differences in pre- and post-test measures are attributed to the treatment. Considered by some as the "gold standard" in educational research in prior decades.
- ❑ **Interviews:** Personal interviews involve brief "conversations" with visitors about their exhibit experience, overall impressions and various demographic characteristics. A structured or semi-structured questionnaire is often used as visitors exit the exhibit area.

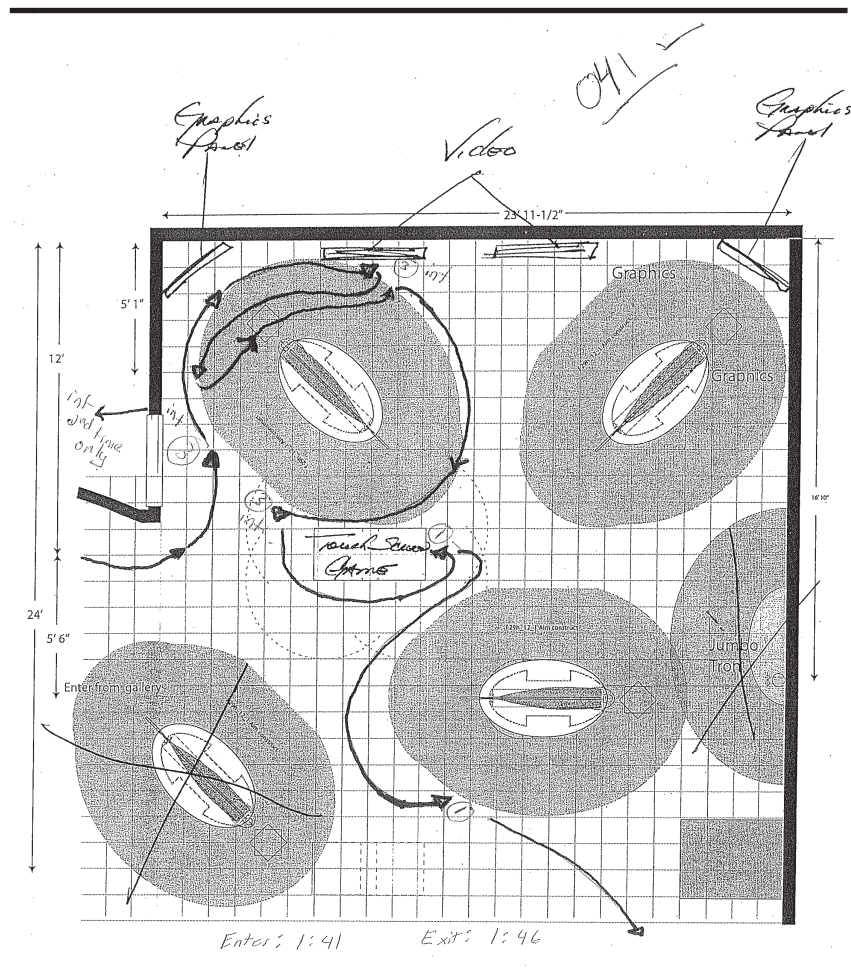
Note: See Hein (1998) and Martin (2001) for more information on the use of these methodologies in exhibit evaluation.

The evaluation team discussed the advantages and disadvantages of the methodologies shown in Figure 1 in light of data needs, budget and timelines associated with the nanotechnology exhibit. Ultimately, the group decided to focus primarily on two of the strategies – visitor observations and interviews with individuals 18 or older (Yalowitz & Bronnenkant, 2009; Falk & Storksdieck, 2005). As the group met and discussed evaluation options over several weeks, the following mixed-methods design began to emerge:

Visitor observations. Up to three evaluation team members agreed to participate in data collection on specified days. Generally, one individual took responsibility for observing and tracking visitors throughout the project. Early experimentation showed that one team member assigned to observations was preferable to having two persons on any given day because one individual could randomly select and track visitors without the need to coordinate with a second person. Having one person take responsibility for observations also simplified the training task and assured that data were collected in a uniform manner. The team member who performed the observations stood near the exhibit entrance with a clipboard, a stopwatch, and detailed maps for recording visitor paths.

The data collector observed and tracked visitors' paths through the exhibit on floor plan maps similar to the example shown in Figure 3. In addition, the data collector tracked the overall amount of time a visitor was in the exhibit, sequence and duration of each stop in the exhibit area, and the level of interaction visitors displayed with: 1) family, friends or other visitors, and 2) the exhibit itself. While the data collector tried to be unobtrusive and stay out of visitors' way, no attempt was made to conceal activities. The individual wore a polo shirt with the university colors and logo and a name tag that identified him or her as a member of the exhibit staff.

Figure 3. Replica of Map Used to Trace Visitor Paths through "Nano in Your Neighborhood" Exhibit



Interviews. Our research strategy also called for up to two individuals to conduct personal interviews with visitors. Experience showed that two interviewers worked effectively in maximizing data collection. These individuals were positioned outside the exhibit to randomly intercept visitors as they exited the exhibit area. However, because our sampling plan required that visitors be in the exhibit for at least 30 seconds, it was important that interviewers be able to see visitors entering the exhibit, as well. Once a visitor was selected by the interviewer, our plan called for interviewers to approach the visitor with a friendly introduction, request the visitor's participation in a short interview, and offer a small incentive for their participation. Following is an excerpt from the script we used to recruit visitors:

Hi. We hope you're enjoying your time at the fair today. I'm <your name> from Purdue University and we're trying to learn what people think of this exhibit so we can improve it before taking it on a national tour. Are you willing to help us by answering a few questions about the exhibit for us? This will take about five minutes, and we can give you a bottled water in return for your participation.

While the bottled water incentive offered to visitors was modest, it served well as an icebreaker and visitors reacted positively. Our rate of interview participation has ranged from approximately 65 percent to 85 percent of visitors across several evaluation projects. While particular interview questions vary according to the exhibit being evaluated, a core set of questions and demographic items has been used in all the evaluations. Sample core items included the following:

- Why did you come through this exhibit today?
- What do you think is the overall message of this exhibit?
- After viewing this exhibit, how would you describe your level of interest in [exhibit topic] (Scale: 1, could care less; 6, so interested you can't get enough)?
- What did you like most about the exhibit? Why?
- What did you like least about the exhibit? Why?
- On a scale of 1 to 5, how would you rate the overall exhibit? (Scale: 1, very dull; 3, average; 5, very fun and interesting?)

The exhibit evaluation methodology described here was replicated with several exhibits over a four-year period. Findings from this work have been indispensable in improving the design and performance of our educational science exhibits in specific ways. For example, visitor tracking data from the "Nano in Your Neighborhood" exhibit revealed traffic flow difficulties that were corrected by changing the location of two electronic game kiosks. Observation and interview data also revealed that text on the exhibit's introduction panel needed clarification. These and other findings, along with measures taken to ensure instrument validity and reliability, have been shared in previous conference presentations (Rhoades, Tucker & Sigurdson, 2009; Tucker, Huerta & Bricker, 2007) and will be published in a future *JAC* article now in progress. The instrumentation used in these projects is available from the authors upon request.

Another valuable byproduct of our work during the past several years is an improved overall exhibit development process. As a result, we have identified 10 major steps that describe and inform

the various phases of a successful exhibit evaluation process. These steps, shown in Figure 4 and discussed below, can be used by others in launching similar educational exhibit evaluation efforts in free-choice learning environments.

Figure 4. Recommended Steps in Exhibit Evaluation

1	Develop learning objectives.
2	Identify resources and personnel.
3	Develop instrumentation.
4	Work out methodological details.
5	Seek human subjects approval.
6	Train evaluation team members.
7	Develop a data collection schedule.
8	Collect and analyze data.
9	Share findings with stakeholders.
10	Convene design and evaluation teams.

Steps to Successful Exhibit Evaluation

1. Develop learning objectives. Identifying a manageable number of learning objectives is one of the most important tasks to accomplish at the outset of the project. Coming to agreement on specific learning objectives you have in mind for exhibit visitors is essential not only to the evaluation process, but to the success of the exhibit in general. Think in terms of three to four tightly written statements that specify the learning goals you want visitors to be able to accomplish after experiencing your exhibit. Once written, these objectives should guide development of the exhibit and the evaluation.

2. Identify evaluation resources and personnel. Early in the project, identify an individual who will provide leadership for the evaluation process. This person will lead the group in developing the evaluation methodology and instrumentation, securing human subjects approval from the university, and addressing other relevant tasks listed in the following steps. If possible, select an individual who has no professional stake in the outcome of the evaluation. Such a person may be an Extension evaluation specialist or a faculty member in your college's agricultural communication or agricultural education program. Don't overlook qualified individuals in your own department, such as a staff member who has completed graduate course work in research methods. Serving in this role will require a significant time commitment, it offers publishing opportunities and the potential to learn more about alternative communication and education research methodologies.

3. Develop instrumentation. The questionnaires and other instrumentation you develop have a direct impact on the quality of your evaluation data. Your evaluation leader should help your group with the order, phrasing and number of the questions you ask. Experience has shown that most of us want to collect more data than we actually need. This impulse can result in lower participation rates and complicate data analysis. Ask only the questions you absolutely need and then think carefully about how items are phrased and ordered. In the case of tracking maps and related instrumentation, make sure they are large enough and of high enough resolution to use easily. Once instrumentation has been developed, perform a field test with a dozen or so individuals as a test to see if the instrumentation is adequate, easy to use and understandable both to your staff and to visitors. After field-testing, your instrumentation is ready to use.

4. Work out details and logistics. Because of its applied nature, evaluation research can be challenging and unpredictable. This is especially true in the free-choice learning environment, which may be in a museum, fair or shopping mall. Advance planning is essential to ensure that evaluation team members have the training and materials needed to start work promptly on the first day of data collection. Copies of instrumentation and questionnaires must be made available in a common area, along with clip boards, pens and any other needed materials. Instructions should be made available in hard copy to remind team members how to select research subjects, how to deal with refusals, and related matters. Team members also need a cell number or other instructions for reaching the team leader if questions arise. While such matters may seem mundane, they take on increased importance once data collection is under way. The primary goal during data collection is to maximize the amount of time spent interviewing and observing exhibit visitors. Poorly organized protocols rob the project of precious time and divert energy needed to collect quality data.

5. Seek IRB/Human Subjects approval. Generally, you are not required to secure human subject approval from your campus Institutional Review Board if you do not plan to publish your evaluation results. Therefore, evaluators may wish to skip this step for initial or very small-scale projects. Even in these cases, however, the evaluation team may wish to access the university IRB Web site for recommendations on ethical social science research practices. Especially valuable is advice on maintaining research subjects' confidentiality and right to privacy during and after data collection (Rennie & Johnston, 2004). Those who do wish to secure IRB approval should allow two to three weeks for this process; no phase of data collection or contact with the subjects can take place before approval is granted. Also keep in mind that all individuals who will have direct contact with exhibit visitors participating in the research should complete CITI (Collaborative Institutional Training Initiative) training on research ethics prior to submission of the IRB request. Consult your university's IRB Web site or IRB office for details.

6. Train evaluation team members. Before data collection, hold a special meeting to brief evaluation team members on the research process and procedures being used. For example, team members should use consistent phrasing when approaching research subjects. They should also administer questionnaires and code responses in a consistent manner. Such matters are critical in evaluation research because they directly influence the validity and reliability of the data. On days when data will be collected, it is helpful to have two to three trained team members available and ready to fulfill whatever roles are needed. As a part of the training process, the evaluation leader may choose to provide team members with a checklist such as that used by the authors and reproduced in Figure 5.

Figure 5. Sample Checklist for Exhibit Evaluation Data Collection

GENERAL
☐ Pick up questionnaires and clip boards from front office.
☐ Wear university attire and nametag.
☐ Turn completed questionnaires in at the front office at the end of each day.
INTERVIEWS
☐ Randomly select individuals to complete interviews.
☐ Inform visitors that the interview takes only a few minutes; those who agree to be interviewed will receive a cold bottled water.
☐ Phrase all items as phrased on questionnaire; write responses as legibly as possible.
☐ Make note of any "interesting" observations.
☐ Write down exact words and expressions used by visitors. Use quotation marks for verbatim responses.
TRACKING
☐ Track only those visitors who have been in the exhibit for at least 30 seconds.
☐ Make note of any "interesting" observations.

7. Develop a data collection schedule. As might be guessed from this discussion, data collection is one of the most crucial steps of the evaluation process. Unlike publications and other traditional media, exhibits are normally set up in particular venues for specified periods of time, ranging from days to months. Audiences of interest may have access to the exhibits only during limited periods. Consider, for example, the case where the evaluation team is interested in 11- to 12-year-old visitors to a science exhibit and it is learned that a school or youth organization will be visiting the exhibit on a particular day. In such a case, the evaluation team needs to be in a position to seek the necessary approvals to interview the youth and then be on location and ready when the group arrives. There may be only limited opportunities to access this population outside of this particular time. An important job of the evaluation leader is to use the team most efficiently to maximize the amount of quality data that can be collected. A hard copy or electronic sign-up sheet should be provided to team members in the days or even weeks before data collection to help determine which team members are available to collect data on each day, length of the work shifts, and related matters.

8. Collect and analyze data. After data collection, all completed questionnaires and instrumentation should be gathered by the evaluation team leader and prepared for data entry. We recommend entering data from the questionnaires into a software application such as Excel or SPSS so that it may be easily analyzed and stored. If the number of questionnaires is relatively small (less than 150 or so), one person can usually enter the data in a matter of a few days. It is important that data be

entered using a properly constructed coding sheet so that the data entry person knows how to handle special cases, such as incomplete questionnaires or missing data. Once the data are entered, the evaluation team leader should be able to generate basic descriptive findings in a matter of minutes to share with the group. The team leader should then work with the rest of the team to determine whether other analyses are needed, such as cross-tabulations or other techniques.

9. Write and share findings with relevant stakeholders. The evaluation process is not complete until all the findings and observations are assembled into a report. The evaluation report need not be publication-quality in the early stages. The main goal is to get findings in front of the exhibit design team and other stakeholders in a form that can lead to brainstorming and discussion. Ultimately, data should be presented in a final impact report that is suitable for sharing with stakeholders, administrators and others. Examples of reports developed by the authors are available upon request.

10. Convene design and evaluation teams to discuss findings and plan next steps. After results have been shared among team members, it is helpful to bring the evaluation team and exhibit staff together to discuss evaluation findings and next steps. Tasks to be accomplished at this meeting include identification of major evaluation findings, discussion of possible adjustments or improvements to the exhibit or exhibit floor plan, features of the evaluation that were especially helpful (or not), and needs for future evaluation. The leader should try to ensure that all team members feel comfortable airing their views and participating in a candid discussion of the research findings and evaluation process. At this stage, the group may also wish to discuss how and when evaluation results and recommendations will be shared with administrators or exhibit sponsors. If evaluation results are to be published, the group should discuss outlets for this work, authorship, deadlines and related matters.

Conclusions

Given the current importance of accountability and the need to measure impacts in higher education, applied communication professionals must increasingly build evaluation into their portfolio of professional services. A particular need exists to develop proven methods for evaluating educational science exhibits because of the significant time and expense required in their production. This professional development paper borrows from the free-choice learning literature and the authors' professional experiences to provide guidelines and recommendations for evaluating educational exhibits. Applied communicators can choose from a variety of different evaluation procedures. Evaluation teams should experiment to determine which procedures best meet their particular needs. Evaluation of exhibits, as with all communications media, must take into account the unique needs and resources of the department undertaking the research. The information shared here provides a starting place for those with limited experience in this area.

Among the key points stressed here is the fact that evaluation is not an ancillary activity but an integral part of the exhibit design process. When possible, evaluation personnel should be included in the initial and ongoing meetings of the exhibit design staff. All personnel must collaborate in the development of a manageable number of learning objectives that can be measured through evaluation. The time spent in assembling and training an evaluation team will pay dividends in terms of efficiency and quality data collection.

A critical phase of the exhibit evaluation process involves interpreting and using the findings. In an ideal world, evaluation results would clearly show that an exhibit has produced measurable and significant gains in learning and awareness in our target audience. Such results could then be used

to justify additional resources for future work. In reality, unambiguous results of this nature seldom emerge based only on one evaluation. Multiple evaluations in different settings may be needed to provide the quality of data needed to document learning.

While Land-grant communicators have an established tradition of evaluating traditional and emerging media and audiences, the profession has little collective experience in studying the performance and impact of educational exhibits in the free-choice learning environment. Exhibit evaluation presents particular methodological challenges and often calls for novel and mixed research strategies to document learning – impacts from free-choice learning cannot be properly studied by simply importing learning objectives and metrics from formal education settings (Rennie & Johnston, 2004; Falk & Dierking, 2000). Evaluators must keep in mind the unique circumstances and limitations of free-choice learning when designing research and interpreting findings. Additional research is needed in this area.

In at least one important way, it is fitting that the literature and methodologies discussed in this paper have been borrowed largely from the museum research tradition. Museums began to appear in the 18th century in response to the notion that education and enlightenment should not be reserved only for the privileged and elite classes, but should also be attainable by working-class citizens. This is essentially the same notion that has sustained the Land-grant idea for 150 years. Although the call to develop expertise in exhibit evaluation and free-choice learning is based on practical needs, it serves a deeper purpose in educating and serving the public and, thus, advancing the Land-grant university mission.

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Keywords

Free-choice learning; educational exhibits; evaluation; mixed methods; science communication.

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The Voices of Minority Students in an Agricultural Communications and Journalism Program: A Case Study

Rebecca McGovney-Ingram, Tracy Rutherford, and Alvin Larke, Jr.

Abstract

In 1998, the National Association of State University and Land Grant Colleges addressed the “access challenge” for minority students, stating nothing less than open opportunity and commitment would embrace the land grant history. Researchers have documented barriers and strategies for the recruitment and retention of minority students in agricultural education. The experiences minority students have in college are unique, and effective recruitment and retention strategies should only be developed after in-depth, explorative conversations with the students; therefore, the purpose of this study was to begin the dialogue with minority students in agricultural communications. Nine students, eight female and one male were interviewed for this qualitative case study. This research was framed by the following questions: (1) Who are minority students within the predominantly White agricultural communications and journalism program at a southern university, (2) What are the experiences of minority students within the predominantly White agricultural communications and journalism program at a southern university, and (3) What are the perceptions of minority students of the predominantly white agricultural communications and journalism program at a southern university.

Introduction

The National Association of State University and Land Grant Colleges (NASULGC) addressed what they called the “access challenge” in their 1998 report on the future of land-grant universities. “Land-grant institutions were created to open opportunity and broaden access for higher education. Today, this historical commitment must encompass the different educational needs of many different kinds of students coming from different and ever-more diverse backgrounds. Anything short of that is not true access in terms of our institutions’ history” (Kellogg Commission, 1998, p. 19). Land grant institutions are now experiencing the future predicted by NASULGC. According to U.S. Census Bureau data from 2000, approximately 30% of the U.S. population is a racial or ethnic minority group (Talbert & Edwin, 2007) and 28.7% of traditional college-aged students are African American or Hispanic (Opp, 2001).

Agricultural programs seem to be embracing the idea of access; however, a thorough review of available literature found no research on the recruitment and retention of minority students in agricultural communications programs. Agricultural education researchers have been conducting research in their discipline, one that can be considered “peer” to agricultural communications and in many land grant institutions is housed in the same department.

One of the key priority areas in the *Strategic Plan for Agricultural Education* claims “Attracting, serving, and retaining historically underrepresented populations will be an important growth strat-

egy for all of agricultural education” (Loudenslager, 2006, p. 5). Agricultural education researchers have documented barriers to minority students entering the field; these barriers have been operationally defined within education research as attitudinal barriers and structural barriers (Opp, 2001).

Attitudinal barriers include minority students’ negative perceptions of agriculture and agricultural programs (Bowen, 1993; Bowen, Bowen, & Heinsohn, 1997; Myers, Breja, & Dyer, 2004; Sutphin & Newsom-Stewart, 1995; Talbert & Larke, 1995; Talbert, Larke, & Jones, 1999), misperceptions of career paths and/or availability (Bowen et al.; Sutphin & Newsom-Stewart), and a view that the profession is made up of, and for, White men (Bowen et al.; Sutphin & Newsom-Stewart).

According to Opp (2001), structural barriers may include lack of financial aid, low number of minority mentors on campus and little minority culture and/or support services; the same areas where agricultural education researchers have focused their recruitment and retention strategies. Westbrook and Alston (2007) stated that “African American students who are surrounded by African American professors are more likely to remain in the agricultural field because they have role models or mentors” (p. 124). This trend is not limited to African American students; a minority student who has a role model who a) shares their culture and/or ethnicity and b) encourages them is more likely to succeed (Bowen, 1993; Jones & Larke, 2001; Talbert et al., 1999; Westbrook & Alston).

Talbert et al. (1999) recommend Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) as an organization where students can interact and network to share experiences. “As a result of the existence of MANRRS and the networking and mentoring it provides, the participation and success of underrepresented students in agriculture and related fields have been enhanced” (Talbert et al., p. 95). Agricultural education researchers have stated that peers can influence one’s attitudes about careers and recommend workshops or seminars during elementary and secondary education to introduce minority students to agriculture and agricultural programs (Bowen et al., 1997; Talbert & Larke, 1995).

Although these recruitment and retention strategies are encouraging, agricultural education researchers have suggested effective recruitment and retention strategies can only be developed after speaking to minority students to discover what factors affect their decision-making process (Jones & Larke, 2001; Sutphin & Newsom-Stewart, 1995; Wildman & Torres, 2001).

Conceptual and Theoretical Framework

Most agricultural education and agricultural communications programs are housed within colleges of agriculture located at land-grant institutions. Of the 107 land grant institutions, 50 can be categorized as Predominantly White Institutions (PWIs). By utilizing PWI research as a conceptual framework and minority student development as a theoretical framework, minority students’ experiences at both the institutional and individual level can be better understood.

Predominantly White Institutions (PWIs)

When legally mandated to open their doors, PWIs admitted cultural outsiders with relatively little thought given or action taken to accommodate the “stranger”... The unchanging nature of most PWIs conveyed to some that white institutions were superior and students attempting to maneuver through them must conform to the institutional standards rather than evolving standards more appropriate for the needs of a diversifying student body (Benton, 2001, p. 22).

Researchers have documented that minorities at PWIs face a plethora of emotions including hostility, isolation, and difficulty balancing between two or more cultures, and barriers including

self-segregation, a one-sided curriculum, and lack of minority faculty or mentors (Benton, 2001; Currence, 2007; Hernandez, 2002; Humphreys, 1998; Jones, Castellanos, & Cole, 2002; Taylor & Olswang, 1997; Westbrook & Alston, 2007). According to Jones et al. (2002), the minority student experience is “distinctly different from that of majority students at PWIs” (p. 23).

The culture at PWIs can be isolating for minority students, whether through overt racism or more subtle prejudice (Currence, 2007). Because some minority cultures are based on strong family ties, minority students at PWIs may feel caught between conforming to the dominant culture on campus and staying true to their own (i.e. returning home regularly) (Currence; Hernandez, 2002). Either of these two factors on their own, or in combination, may lead to a third factor for minority students at PWIs: Self-segregation. This “seeking out” of other students who share their color, culture, background, or story is a coping mechanism for minority students (Benton, 2001; Hernandez).

Several ways exist to alleviate this sense of isolation for minority students at PWIs. One way is for students to create positive relationships with minority faculty or staff members because “personal, concerned contact appears to have a mitigating influence on the inherent isolation experienced by [minority] students” (Taylor & Olswang, 1997, p. 16). Closely related is creating places or organizations for minority students to go where they can feel welcomed at PWIs (Jones et al., 2002; Taylor & Olswang). Because PWIs reflect the dominant culture, minority students may not see themselves, their history, or their culture in the curriculum (Benton, 2001; Taylor & Olswang). Faculty members should examine their courses to ensure they are being inclusive in both their curriculum and teaching styles. “Research shows that when students perceive that there is a broad campus commitment to diversity, there is increased recruitment and retention of students from underrepresented groups and an increase in all students’ satisfaction and commitments to improving racial understanding” (Humphreys, 1998, p. 2).

Minority student development theory

College is a critical time for students as they answer the questions “who am I” and “who am I not” (Torres et al., 2003). These questions are at the heart of student identity development. A basic definition of student development provided by Rodgers, a key researcher in student identity development, is “the ways that a student grows, progresses, or increases his or her developmental capabilities as a result of enrollment in an institution of higher education” (Evans, Forney, & Guido-DeBrito, 1998, p. 4).

Student identity development theorists from Erikson to present, however, have called attention to the role the environment can play in a student’s development (Torres et al., 2003). “The first aspect that should be understood about campus culture is that ‘dominant campus features reflect the influence of the dominant groups’... This component of campus culture can influence how the racial, ethnic, or multiple identities of students develop” (Torres et al., p. 80).

Student identity development must also be understood as a very individualized, personal journey; no two people will experience it the same way. “A college student’s identity development is a complex and individual process based on choices that bring congruence between old and new learned beliefs” (Torres et al., 2003, p. 7).

Researchers have developed several models to look at minority student identity development, but they call them road maps or guides because the student’s development can be affected by their personal and environmental experiences. Each model has a number of stages along a continuum, although the model may not necessarily be linear in nature (Atkinson, Morten, & Sue, 1993; Hardiman & Jackson, 1992). While there are models for specific races and all races are unique, the researchers

chose a model for all minority students because “the fact they have been subjected to various forms of physical, economic, and social discrimination suggests they share a common experience” (Atkinson et al., p. 27).

The Minority Identity Development (MID) Model developed by Atkinson et al. (1993) includes five stages—conformity, dissonance, resistance and immersion, introspection, and awareness (Atkinson et al., 1993; Chickering & Reisser, 1993; Torres, Howard-Hamilton, & Cooper, 2003). In the first stage, conformity, minority students prefer the dominant culture over their own and may try to assimilate. Stage two, dissonance, occurs when minority students begin to question the beliefs from stage one; this can be a gradual process or a sudden occurrence (Atkinson et al.; Torres et al.). In stage three, resistance and immersion, the minority student completely accepts his/her own culture and rejects the dominant culture. Stage four, introspection, is a more personal stage. Minority students move away from the group views to which they ascribed in stage three and begin to develop their own personal identity (Atkinson et al.; Torres et al.). In stage five, awareness, minority students complete their self-introspection and accept or reject views from all cultures based on their own views and experiences.

By combining knowledge of the MID Model and PWI research, faculty and staff in agricultural communications programs will be better prepared to understand the experiences of their minority students, both at the individual and environmental level. Furthermore, this knowledge can, and should, be used to develop appropriate strategies for connecting to, interacting with and helping minority students.

Purpose

There is a lack of research on the recruitment and retention of minority students in agricultural communications programs. However, because the experiences minority students have in college (especially PWIs) are unique, effective recruitment and retention strategies should only be developed after in-depth, explorative conversations with students. The purpose of this study was to begin that dialogue with minority students enrolled in a predominantly White agricultural communications program at a PWI land grant located in the southern United States. This study was guided by three research questions:

- RQ1:** How do minority students within the predominantly White agricultural communications and journalism program at a southern, PWI, land grant describe themselves?
- RQ2:** What are the experiences of minority students within the predominantly White agricultural communications and journalism program at a southern, PWI, land grant?
- RQ3:** What are the perceptions of minority students of the predominantly White agricultural communications and journalism program at a southern, PWI, land grant?

Methods

This study employed a qualitative case study methodology. Denzin and Lincoln (2005) defined qualitative research as “...an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings that people bring to them” (p. 3). Although different than quantitative research, qualitative research is similarly characterized by methodological acts that are

expected across the profession. These include an inductive research strategy, an emergent research design, small sample size, time in the natural setting, understanding the meaning people have constructed, understanding a phenomenon from the participants' perspective, and the researcher(s) as the primary data instrument (Dooley, 2007; Lincoln & Guba, 1985). Lincoln and Guba further describe the research paradigm as including value-bound inquiry, an interactive relationship between the inquirer and the subject, and "time-and-context bound working hypothesis" (p. 37).

For this study, the researchers used a purposive sampling technique, a convenience sample. A list of the minority students enrolled in the agricultural communications and journalism program at this southern, PWI, land grant was obtained from one of the agricultural communications and journalism advisers. These 16 students were sent an initial contact email asking them to participate in a one-hour interview. Nine of the students agreed to, and kept, appointments for interviews during the data collection period of November 3 - December 3, 2008. Interviewees were assigned a code to protect their identity. The code was based on their major, their gender, and the order in which they were interviewed (for example, ACF1: agricultural communications and journalism, female, and the first to be interviewed).

Each interview transcript was typed, analyzed for individual units, and then imported into a computer program to print the units onto note cards. The researcher used the constant comparative method for data analysis. This four-step process begins with comparing the units to each other as categories emerge, solidifying the categories and their properties, reducing the number of categories while unit saturation occurs, and then writing the results (Lincoln & Guba, 1985). According to Dooley (2007), "data analysis throughout the process allows the researcher to 'test' working hypotheses that emerge from the initial patterns for the next wave of data collection" (p. 37).

Lincoln and Guba (1985) stated that qualitative researchers must establish trustworthiness just as quantitative researchers must establish rigor. Four criteria exist to establish trustworthiness—credibility, transferability, dependability, and confirmability. Credibility was addressed in the study by peer debriefing, "a process [that] helps keep the inquirer 'honest,' exposing him or her to searching questions by an experienced protagonist doing his or her best to play the devil's advocate" (Lincoln & Guba, 1985, p. 308). Because naturalistic inquiry is time- and context-bound, transferability is achieved through thick, or detailed, description. Dependability and confirmability were both addressed in this study by establishing an audit trail and keeping a reflexive journal. The researchers would also like to acknowledge that their positionality (race, gender, class, etc.) affects the way they construct knowledge, view research and interact with students. Two of the researchers, a white female and a black male, teach and research diversity issues in agricultural leadership, education and communications. Two of the researchers, one white female and one black male, are professors within the department, one of whom teaches within the agricultural communications and journalism program.

Results

At the time of this study, the nine students ranged in age from 20 to 24 years old, and classified from sophomores to seniors in school. There was one male and eight female students interviewed. Interviews, scheduled at the students' convenience, were conducted in on-campus locations related to the major with which the students were already familiar.

The students

The students all chose to define themselves in terms of their family. ACF3, for example, said that she has a twin who lives with her in the dorm on campus, while ACF4 said: "I'm from a family

of four, one little sister and a dog (five with the doggie), we're upper middle class." Several students gave self-definitions in addition to their family descriptions. "I'm an outgoing person, love to talk, very curious, understanding, intelligent," ACF6 said. ACF5 described herself in terms of religion: "Pentecostal is what I am, you see it in my dress, hopefully you see it in my personality, it's a one God, Christian religion." Only two students described themselves in terms of race or ethnicity, and one, ACF7 said she was "Americanized Hispanic."

Their families

The students described their families in detail, who they are and what they do. Most of their parents hold what would be considered white collar jobs, placing the students in theoretically middle-to-upper middle class situations. ACF3 said her father is an executive chef at a restaurant who "wants to open his own when contract [sic] is up in two years." Both of ACF8's parents are engineers for a large electronics development company, where ACF6's father works as a manager. ACF4's mother works in the governmental relations department of a research hospital while ACF2's mother is a nurse at a teaching hospital. In contrast, two of the students had much different stories to tell about their families. "Mom is in welfare and housing program, school helped me out with school [college] application fees," ACF1 said. ACF5 said her mother was a nomad while she was growing up. "We never had a house or apartment to call ours, always lived with relatives. It sucked, no home, no stability, always keep your bags packed, you never know where you're going to go," she said.

Schools

When schools, both secondary and postsecondary, came up in the interviews, a mix of viewpoints was shared by the students. Two students said they went to public high schools, specifically stating that they were diverse. "High school was very diverse, someone from every type of background, because of magnet [sic] drew from across the district," ACM9 said. In contrast, two students who said they went to private high schools did not mention the racial make-up of their schools. Four of the students said they are first-generation college students, and for some, they are the first in their family to ever attend college. "First one to actually go to school, to do something beyond high school... my sister is currently applying to schools in Texas and Georgia," ACM9 said. ACF1 said she did not even know that something existed after high school, what college was. "I just went day by day, started asking questions in high school because I had friends who were planning to go to college, my counselor started telling me, 'oh yes, after high school you go to college'." In contrast, ACF4 said: "I always assumed I would go to college, always instilled in me throughout growing up, my Dad has always said 'I want better for y'all than I had'."

Choosing Agricultural Communications and Journalism

The students' reasons for choosing agricultural communications and journalism as a major fell into two categories. The first group wanted to do something communications related, and this is where they ended up. "Originally started out journalism, they took it off and I didn't know what to do because I was like 'I don't want to study anything else this university offers,' and because I was in the Corps I decided to stay in," ACF1 said. Another student, ACF3, echoed this sentiment when she said "...since A&M doesn't have a regular journalism program I thought I try the agriculture part of it and see how that goes." The second group of students said they chose this major after being kicked out of their first major, or the university, due to poor academic performance. "Honestly the

truth was that I got put on probation while I was in English, I didn't meet the probation so they basically dismissed me, so my only choice was to pick a major that would accept my GPR as-is or drop out of [school]," ACF2 said. ACF4 also transferred to agricultural communications and journalism from English: "The only reason I became an ag major, I was an English major but partied too much freshman year and I, um, had lower than a 2.0 and I had to look for another major to transfer to or I was going to get kicked out of the university." Although ACF6 did not mention her major, she had a similar story. "Considering the fact that I failed one of my classes which made my GPA drop, so I had to get into ag or get out of school, and mom wasn't having that," she said.

Because none of the students were original to agricultural communications and journalism they were asked how they had discovered the major. Most said that an adviser or a friend had told them about it. Interestingly, they were all told to speak to a specific agricultural communications and journalism professor. Their initial meeting with that professor made a lasting impression on many of the students. "First meeting with [the professor] was great...we talked past 5:30...I was surprised she didn't try to dismiss me...I felt so welcomed in that first meeting with her that I was glad that I got kicked out of the English department," ACF2 said. ACF7 said that while the people in the business department had seemed cold and uncaring to her, [the professor] was welcoming which made her excited about joining the major. "Talking to her made me feel at home, and that's why I decided to join the major," she said. Another student, ACF5, said: "When I first met [the professor] it was like Paula Dean, she made me feel really comfortable and made everything look really pretty."

The students were then asked if they could change anything about the major, what they would do. Several students said they would focus on getting the word out about the program, telling more people, and bringing more people in. "I would pour more money into the program, everybody would know about ag comm...I don't feel like we get enough attention, I don't feel like we get enough respect," ACF5 said. In a similar train of thought, ACF7 said: "We should advertise ourselves better to students because if my advisor had never told me to call [the professor] I would never had known about this [major]." ACM9, ACF3, and ACF6 suggested recruiting more minority students to the program.

Recruiting more minority students and making sure our major is known to everyone: "I feel like we recruit FFA students and more students towards agriculture and because that's what they've been around their whole life, I didn't know about agriculture until I got here," ACM9 said.

Faculty and Staff

The students' feelings of comfort and welcome extended to the other faculty and staff members in the program as well. "They want you to do well so they'll help you out any way they can, whether it's helping you out after class, even helping you out with simple things," ACF7 said. ACF2 shared similar thoughts, saying "It's more of a personal relationship, they try to help you...they don't try to brush you off like they did in the English department...here they treat you like an individual." Many of the students attributed this feeling of acceptance and familiarity to the fact that the program is so small; everyone knows each other and is on an individual level. "I feel very at home and very at ease, especially because we are such a small major, it makes me feel very connected to everyone...even as T.A.'s come in I'm able to connect with them," ACF4 said. Two students said they did not feel like they were part of the major yet, but said it was because they were still learning—either about the subject or about the department. "I feel like I'm in the freshman shoes getting into the major, getting into the classes and stuff, just dipping into it, trying to figure out what this whole department's about," ACF8 said.

Fellow Students

There were mixed reactions when the students were asked to describe their friends within agricultural communications. “The reason that I like ag journalism is because everyone knows each other, unlike other departments where there’s like 5-600 kids in the major, there’s only a handful of us so we get to know each other,” ACF7 said. ACF2 shared similar thoughts saying: “They’re great, it’s not a big major so you have the same people in every class for the most part, we’re all in the same classes.” However, some said their friends are outside the department and these are the people they go to class with. ACF6 said: “To be honest I don’t have any friends in this department, I have associates I guess you could say, and I don’t even know their names, I just talk to them in class.” ACF8 said: “I haven’t really talked to them outside of class, but for the most part I would consider them acquaintances.”

While discussing the other students in the major, ACF5 and ACF3 expressed concern that the students were different than them. “I don’t think anyone would be interested in the same things I am that are in my major...I don’t think we would have much in common,” ACF3 said. ACF5 said: “I am extremely intimidated of everyone that is in this major, I feel like they have the upper hand, like they have an advantage.” The students also discussed their friends outside the major. While ACF7 talked about a friend from a summer internship, ACF5 and ACF3 mentioned friends from home. ACF1 said her friends are outside of her school activities, fellow minority students whom she mentors.

Classroom and Program Experience

The students were asked to imagine themselves sitting at a desk in one of their typical agricultural communications and journalism classrooms. Once they had that image in their minds, they then were asked to look around them and describe who or what they were seeing. ACF4 for example said: “I see a lot of familiar faces, pretty much...” Similarly, ACF7 said: “I see most of the people I know as friends...we’re in the computer lab.” ACF1 said she saw students from both agricultural communications and journalism students and those from other majors taking the class to improve their writing. Two students focused on the female-male ratio within the classroom. “Probably like 20 females and like five males, most of them are like upperclassmen who are really excited about graduating and moving on,” ACM9 said. ACF8 said: “A lot of girls, there are some guys in there, they might be ag comm majors but I’m not sure, I can’t tell with the guys.”

Five of the students saw race or ethnicity when they looked around them in this scenario. ACF2 said “I notice the majority of our students are White, there are not a lot of African American students in our major.” In addition to noticing the majority of women in her classroom, ACF8 also noticed the racial makeup. “There’s probably a good majority in the class are Caucasian [sic],” she said. ACF5 also noticed race and gender, saying: “I see Farmer Joe’s daughter, I see the all-American White girl, blonde or brown hair, country accent.” Two students, ACF6 and ACF3, described how sitting in a classroom surrounded by a majority of people not of their race made them feel. ACF3 said:

“I mainly see mostly White students, mainly girls, and there’s two Black students in one class... like I’m the person that sticks out because I’m one of three Black students in the class...everyone else is White, which may be why I don’t know a lot of people in my major, I feel like I stick out a little bit because of that.”

This feeling of not being able to connect was echoed by ACF6. “All white, one Black sitting next to me...sitting in an all White classroom is different because you feel like there’s no one who can relate to you because honestly you can’t relate to them,” she said.

In comparison, some of the students said they just do not see race. When this description was probed, the students provided varying answers. ACF1 said “I know I’m a minority, but when I’m there I don’t see a difference, everything just shuts down, I never feel like a minority.” ACM9 said that he does not see color in this situation, that “everyone is friendly...and no one says anything that is out of place.” ACF2 and ACF7 say they do not identify themselves as a minority.

I think growing up, my mom came from a predominantly White neighborhood and her parents wouldn’t let her speak Spanish and they taught her to be more Americanized, so growing up I never saw myself as ‘ACF7, the Mexican,’ I saw myself as ‘ACF7.’

Similarly ACF2 said: “I’ve never really thought about ‘wow, there’s only a handful of Mexicans,’ I guess since I’ve never really thought of myself as a minority, as we said in class, people see me as White.”

In comparison, the students all stated they have never experienced or observed any racially-related incident in the program and/or the department. When asked, they all replied “no” immediately.

Student Organizations

The researchers wanted to understand the reasons minority students would join an agricultural communications organization, Agricultural Communicators of Tomorrow (ACT), and/or MANRRS. Except for one who had been an officer of the organization, the rest of the students had never heard of MANRRS. The one student who had joined, ACF1, said:

“The program offers a lot of opportunities for students that I never thought of...I met a lot of important people, as a minority student I never thought I could do those things...go to a conference, fly on an airplane...I never pictured those things.”

All of the students were familiar with ACT, and six of the nine were members. The students who had not joined ACT said their schedules were full; they either had conflicts with the meeting time or too much going on to add another organization. One student chose to join Public Relations Student Society of America (PRSSA), another student communications organization, rather than joining ACT. Those who have joined described multiple membership benefits including getting to know their fellow students and connections for future jobs. “I joined so I could get to know different people, a good opportunity to be known as well as to get to know people, pick up a little knowledge along the way,” ACF6 said.

Conclusion

College is a critical time in the development of students’ identities. Researchers have shown that environment, in the form of campus culture, can play a role in this development process (Torres et al., 2003). When minority students are in programs or at institutions that have barriers such as those documented in agricultural education or at PWIs, this can further influence how their identity does, or does not, develop. These barriers can include a lack of minority faculty or mentors, culture, organizations, and/or support services.

The first research question that guided this study was, “How do minority students within the predominantly White agricultural communications and journalism program at a southern, PWI, land grant describe themselves?” The students interviewed for this case study described themselves first in terms of their family. Going by their parents’ jobs, most of them can be classified as middle class, and four of them are first generation college students.

The second research question guiding this study was, “What are the experiences of minority students within the predominantly White agricultural communications and journalism program at a southern, PWI, land grant?” Many of the students interviewed simply do not see race, in themselves, in the classroom setting, or in the program. The five students who did see race described the classroom as predominantly White (and female). They feel like they do not fit in or cannot relate to the other students.

When asked about two different organizations, ACT and MANRRS, only one of the students (an active member) had ever heard of the minority organization and this organization had taken out a full-page advertisement on the back cover of the magazine produced by students in the agricultural communications and journalism program. Researchers studying minority students in both agricultural education and PWIs have stressed that minority students need places to go where they can feel welcomed, and Talbert et al. (1999) stated that MANRRS can enhance the success of minority students in agriculture.

The third research question that guided this study was, “What are the perceptions of minority students of the predominantly White agricultural communications and journalism program at a southern, PWI, land grant?” The students had positive feelings towards the program overall, especially for the faculty and staff. Most of them described how welcome one specific professor made them feel during their initial meeting. They also said that every faculty member is open and caring, developing one-on-one relationships with the students, which means a lot to them. Although they said they knew a lot of their classmates because the program is small and they take classes together, many of them are more on the level of acquaintances than friends with others within the program.

The minority students interviewed seem to feel deeply and personally connected with the faculty within the agricultural communications and journalism program at this southern, PWI, land grant. Although research in minority retention and recruitment has shown minority role models tend to have a positive effect, Wildman and Torres (2001) stated “the friendliness of a departmental faculty and the overall friendly atmosphere in the College of Agriculture lead to selecting a career in agriculture” (p. 54). Many of the students interviewed transferred into the program after attending this southern, PWI, land grant for one or more years and credit the faculty as one of the reasons for choosing the program.

The students expressed conflicting views of minority identity. Some said they do not *see* race while one said she can “pass for White.” These students seem to be at stage one of the MID, conformity; they prefer the dominant group while they devalue their own individual and/or group identity. In contrast, several students described feeling different from their classmates or isolated within the classroom because of the color of their skin. These students seem to be at stage two of the MID, dissonance; these students are beginning to feel a conflict between the dominant group and their own individual and/or group identity.

Several of the students said their friends were either outside the agricultural communications and journalism program or “back home,” suggesting that these students are self-segregating or balancing two cultures as described in the PWI literature. Additionally, the minority students themselves stated that a future focus for the program should be bringing in more minority students. This combination of attitudes suggests some of the minority students within the program may be in stage three of the MID, resistance and immersion; they are accepting all minority group views, rejecting all dominant group views and seeking to eliminate oppression.

Based on the knowledge gained from applying PWI research and minority student development theory to the minority students' responses, the researchers have several recommendations for faculty in this agricultural communications and journalism program to further develop their roles as mentors for both minority and nonminority students. The faculty should model inclusion behaviors for nonminority agricultural communications and journalism students to learn. Second, they should ensure channels of communication are open so minority students can present any concerns they may have. Finally, faculty should strive to be more aware of the vulnerable environment that minority students feel the agricultural communications and journalism classroom presents. By focusing on these recommendations, faculty will be able to strike a balance between minority student identity development and recruitment and retention within their program.

The National Research Agenda has emphasized the need to “develop effective agricultural workforces for a knowledge-based society” (IFAS, 2007, p. 11) and “provide insights to strengthen courses, curricula and other aspects of academic programs in agricultural communications, agricultural journalism, development communications, life sciences communications, and related professional areas of interest” (p. 11). This study began the conversation with minority students in agricultural communications. Because it is a case study, the results are not generalizable; however, the description provided may allow others to see similarities in their own agricultural communications program and conduct similar qualitative studies thereby continuing the conversation and furthering the knowledge base relating to minority students, retention and recruitment, student identity development, and agricultural communications.

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Keywords

Recruitment and retention, minority students, agricultural communications and journalism

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Citation Structure: An Analysis of the Literature Cited in the *Journal of Applied Communications* from 1997 to 2006

Leslie Edgar and Tracy Rutherford

Abstract

The Journal of Applied Communications (JAC) is a primary outlet of agricultural communications publishing and research dissemination. The purpose of this study was to assess ten years of JAC to determine literature cited. The study used a quantitative content analysis design. Analyzed in the study were 91 research and/or professional articles with research methodologies published from 1997 through 2006. There were 1,732 cited literature works identified in the journal. The average number of citations per article was approximately 19. Cited works from identified premier agricultural education journals were tracked for citation frequencies, in terms of author(s) and year of publication. A total of 143 references were made to journals identified as premier. The most frequently cited journals were from journalism, communications, and mass communications sources, including JAC. Additional cited works are defined. Citation analysis indicates that JAC relies heavily on books, journals, conference proceedings, and other literacy works outside agricultural communications. JAC does not exhibit compactness, indicating that it reaches past its citation boundaries and into interrelated areas of other disciplines. However, it does exhibit weak self-identity meaning it does little to build upon research previously cited in JAC.

Introduction

The Journal of Applied Communications (JAC) has undergone numerous changes since its conversion from a newsletter to a journal in 1990. Some of those modifications have included a change in format and frequency of publishing and content. During *JAC*'s lifespan, a number of researchers have examined various publishing and research aspects of the agricultural communications and agricultural education professions. One focus of the previous research has been on previously cited literature (Miller, Stewart, & West, 2006; Moore, 1991; Radhakrishna, 1995; Radhakrishna, Eaton, Conroy, & Jackson, 1994).

Previous research indicated the explicit need to analyze citation characteristics in agricultural education (Radhakrishna et al., 1994). The research further noted "a number of researchers in various scientific disciplines have considered citation structure as a good indicator of the nature of scientific activity" (Radhakrishna et al., p. 61). Furthermore, quoting additional experts whom indicated an analysis of citation structures "characterize a field of study, define its boundaries, and explain how a discipline is interrelated with other fields of study" (Radhakrishna et al., p. 61). Citations can be used as an indicator of scholars' behavior because it reflects an author's debt to earlier works. The frequency of cited literature can provide a framework of important references and can be a means by which authors anchor their work and relate it to earlier research (Garfield, 1998).

In 2006, Miller, Stewart, and West's research identified the need to review literature and track citations to maintain a clear sense of the disciplines research agenda. In a reply to Doerfert's (2003) essay, Tucker (2004) made further comments to support the need for those in agricultural communications to take notice of research citations. As the discipline progresses forward with research, after the development of a National Research Agenda [NRA]: Agricultural Education and Communication 2007-2010 (Osborne, n.d.); it is important to understand how agricultural communications has moved forward with citations within the discipline. Are we primarily citing works created in our field, or do we rely on other disciplinary areas as literary staples? In 1994, a content analysis of the *Journal of Agricultural Education* indicated that the agricultural education discipline appeared to have a strong self-identity (building on other researchers' work within the discipline of agricultural education) and compactness (citing from few "core" journals) (Radhakrishna et al., 1994). However, a 1995 study indicated agricultural education should expand their focus to include other areas of research interests for professionals in the field (Radhakrishna, 1995). Little to no research has focused on literature citations in agricultural communications, specifically how agricultural communications literature feeds into the broader umbrella of agricultural education and/or mass communications and journalism. In addition, there is a need to determine the level of self-identity and compactness represented in literature cited in *JAC*.

As agricultural communications continues to expand in knowledge pursuit, development, and examination, it is important to analyze the dimensions and frequencies of citations in its premier journal, the *Journal of Applied Communications* (Edgar, Edgar, Briers, & Rutherford, 2008). *JAC* should also be examined to determine the level and depth of literature citations being made to *JAC* articles, to other premier journals identified in the agricultural education discipline, and to other journals that support the field such as mass communications and journalism. Besides *JAC*, premier journals in agricultural education include the *Journal of Agricultural Education*, the *Journal of International Agricultural and Extension Education*, the *North American Colleges and Teachers of Agriculture Journal*, the *Journal of Extension*, and the *Journal of Leadership Education* (Edgar et al., 2008). With the development and embracing of the NRA it is important for the agricultural communications field of study to understand how other established premier journals are being utilized within the field. Citation structure research has been used to characterize a field of study and explain how a discipline is inter-related to other fields (Narin, Carpenter, & Berlt, 1972).

Analyzing literature citations adds to the understanding and the identification of the literature base of agricultural communications. In an effort to better understand where the agricultural education discipline is securing information to support the contexts of the broad disciplinary areas identified in the NRA, content analysis can be used to analyze literature cited. To better understand the scope and impact of agricultural communications on the agricultural education discipline, the journal identified as premier for the agricultural communications disciplinary area (*JAC*) should be analyzed (Edgar et al., 2008).

In 1994, one of the first attempts to quantify cited literature in agricultural education was conducted (Radhakrishna et al., 1994). Since that time little to no research has focused on cited works within the field. It appears that Miller, Stewart and West's (2006) research was one of the first attempts to track literature citations in agricultural communications. Prior to and after that time, little to no research was conducted to determine cited works within agricultural communications. However, analyzing cited science literature has been important since the 1950s (Garfield, 1998). In 2006, Funkhouser completed a citation analysis of twenty-seven communication journals published

during 1990. This research introduced the Journal Impact Rating System (a measure for comparing journal impact on the basis of citations). This rating system can be used to determine the scope and impact of literature on a field of study and to create leverage when attempting to place a scholarly communication journal into the Social Sciences Citation Index (SSCI). It is crucial for agricultural communications to examine cited works used in its premier journal in an effort to determine how its previous works are supporting current works, how research is supported by other premier journals in agricultural education and the mass communications and journalism field, and identify *JAC*'s self-identity and compactness levels.

Conceptual Framework

The future of agricultural education and communications depends on many variables and application and acquisition of new knowledge via research is extremely important (Dyer, Haase-Wittler, & Washburn, 2003). The conceptual framework of the study was grounded in work by numerous scholars in agricultural education and agricultural communications. Several researchers have completed various components of journal analyses in agricultural education: Familiarity and quality of journals and importance of faculty publishing (Radhakrishna, 1995; Radhakrishna & Jackson, 1993); research theme areas (Buriak & Shinn, 1993; Dyer et al., 2003; Edgar et al., 2008; Miller et al., 2006; Moore, 1991; Radhakrishna & Xu, 1997; Silva-Guerrero & Sutphin, 1990); prolific authors (Harder & Roberts, 2006; Radhakrishna & Jackson, 1995; Radhakrishna, Jackson, & Eaton, 1992); statistical methods used (Bowen, Rollins, Baggett, & Miller, 1990; Dyer et al., 2003; Mannenbach, McKenna, & Pfau., 1984), and cited literature (Moore, 1991; Radhakrishna et al., 1994; Radhakrishna, 1995; Miller et al., 2006). Conceptually this study focused on cited literature. Citationology, the theory and practice of analyzing citations, "allows a discipline to determine reference topology" (Garfield, 1998, p. 69).

Purpose and Objectives

The purpose of this study, which was a part of a larger study, was to review research published in the *Journal of Applied Communications* from 1997 to 2006 and examine the historical record of the journal to provide insight into its cited works. The specific objective was to describe and synthesize frequent literature cited in *JAC* during the ten year period by (a) premier journal articles (represented by author(s) and year) (premier journals were identified in previous research by Edgar et al., 2008); (b) journals; (c) books/texts; (d) proceedings, conferences and meetings; (e) other works (dissertations, extension and university manuscripts, magazines, newspapers, etc); and (f) websites.

Research Methods and Procedures

This study employed a quantitative content analysis design. Content analysis as a research method has existed for decades (Weber, 1990). Content analysis can be used to give researchers insight into problems or hypotheses that can then be tested by more direct methods. Content analysis is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson, 1952; Krippendorff, 1980; Weber, 1990).

Content validity was maintained using previous research as a guide. Research journal articles from 1997 to 2006 in the *Journal of Applied Communications* were used as the frame for the study. The principal investigator and a peer independently reviewed the material and formed a checklist of information required during the review of each journal article. The researchers compared notes

and reconciled differences on their initial checklists via negotiations. Researchers used a consolidated checklist to independently apply coding. The citation check list included items such as: author names, date of publication, title of article, source of publication, etc. The researchers then checked for agreement in coding; if reliability was not acceptable, then the previous steps were repeated. Once reliability had been established, coding was applied on a large-scale basis. The final stage was a periodic quality control check (Weber, 1990). Inter-coder reliability was completed with at least 10% overlap for the reliability test. Final reliability was calculated using a random sample of 5% of the analyzed articles. Reliability was assessed using Spearman's rho statistical analysis. Spearman's rho is a statistical calculation that takes two rankings and produces a numerical relation from 1 to -1 (A score of 1 means that the lists are identical, a -1 means that the lists are reversed, and 0 (zero) score means that there is no relation whatsoever between the two lists). Reliabilities met or exceeded the minimum standard of .70 (Bowen et al., 1990; Tuckman, 1999).

Findings

All research and/or professional articles with research methodologies (N = 91) published in *JAC* from 1997 to 2006 were analyzed for cited literature. A total of 1,732 cited works were identified. The average number of citations per article was approximately 19. Premier agricultural education journals were tracked for literature cited in *JAC*, in terms of author(s) and year of publication. A total of 143 references were made to premier journals in agricultural education. Representing approximately 8.25% of the total cited literature in *JAC*. There were 36 cited works from previous publications from the *Journal of Agricultural Education (JAE)*. Lindner, Murphy and Briers (2001) were the most frequently referenced *JAE* authors identified in the 10-year analysis of *JAC*. Their article focused on non-response error was cited in more than 8% of the referenced *JAE* articles. Additional frequently referenced *JAE* articles, identified by the author(s) and year of publication, cited 5.6% or more are identified in Table 1.

Table 1

Frequently Cited Journal of Agricultural Education Authors Referenced in JAC 1997–2006 (n = 36)

Journal Author(s) and Year of Publication	<i>f</i>	%
Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001)	3	8.3
Birkenholz, R. J., Harbstreit, S. R., & Law, D. A. (1990)	2	5.6
Cano, J. & Martinez, C. (1991)	2	5.6
Clason, D. L. & Dormody, T. J. (1994)	2	5.6
Rollins, T. J. (1990)	2	5.6
Rudd, R., Baker, M., & Hoover, T. (2000)	2	5.6
Torres, R. M. & Cano, J. (1995)	2	5.6
Vestal, T. A. & Briers, G. E. (2000)	2	5.6
Whittington, S. (1995)	2	5.6
Whittington, S. (2000)	2	5.6

The 10-year content analysis of *JAC* yielded one citation to the *Journal of International Agricultural and Extension Education (JIAEE)*. The cited article was authored by Rivera (1996).

There were 37 total citations from works previously published in the *Journal of Extension (JOE)* represented in the *JAC* analysis. An article on non-response error authored by Miller and Smith (1983) was the most frequently cited. Their article was referenced in 16.2% of the identified *JOE* articles. Table 2 contains a list of frequently cited *JOE* articles, identified by the author(s) and year of publication, referenced 5.4% or more.

Table 2

Frequently Cited Journal of Extension Authors Referenced in JAC from 1997–2006 (n = 37)

Journal Author(s) and Year of Publication	<i>f</i>	%
Miller, L. E. & Smith, K. L. (1983)	6	16.2
Caffarella, R. S. (1982)	2	5.4
Jackson, D. & Smith, K. (1999)	2	5.4
Obahayujie, J. & Hillison, J. (1988)	2	5.4
Tennessen, D. J., PonTell, S., Romine, V., & Motheral, S. W. (1997)	2	5.4

There were five citations referencing works from the *North American Colleges and Teachers of Agricultural (NACTA)* Journal identified in *JAC*, for the 10-year content analysis. Each of the five *NACTA* articles was referenced once. The referenced authors were Diebel, P. L., McInnis, M. L., and Edge, W. D. (1998); Miller, G. (1997); Nehiley, J. and Sutherland, J. (1995); O’Kane, M. and Armstrong, J. D. (1997); and Woirhaye, J. L. and Menkhaus, D. J. (1996) (each article represents 20% of the overall citations represented from *NACTA*).

There were 64 citations referencing works from previous *JAC* articles. Reiser’s (1990) article focused on agricultural communication programs and curricula was the most frequently cited *JAC* publication in *JAC*. The article was cited in slightly more than 6% of the referenced articles. The Banning, S. A. and Evans, J. F. (2001) article focused on the advertiser-media-reader triad, the Miller, G. & Carr, A. (1997) article focused on distance education needs, and the Ten Eyck, T. A. (2000) article focused on food safety were each references three times (4.7%). Table 3 contains a list of frequently cited *JAC* articles, identified by the author(s) and year of publication and cited at least 3.1%.

The 10-year content analysis of *JAC* yielded no citations to the *Journal of Leadership Education*.

In *JAC*, there were 143 citations referencing the six premier agricultural education (AGED) journals as identified by Edgar et al. (2008). An important component of this research was identifying how *JAC* was citing other journals within the large umbrella of the agricultural education discipline. The most frequently cited referenced premier AGED journal article was produced by Miller and Smith (1983) for their work published in the *JOE* (4.2%). Their article focused on handling nonresponse error. Followed by Reiser’s (1990) *JAC* article focusing on agricultural communications programs and curricula.

Table 3

Frequently Cited Journal of Applied Communications Authors Referenced in JAC from 1997–2006 (n = 64)

Journal Author(s) and Year of Publication	<i>f</i>	%
Reisner, A. (1990)	4	6.3
Banning, S. A. & Evans, J. F. (2001)	3	4.7
Miller, G. & Carr, A. (1997)	3	4.7
Ten Eyck, T. A. (2000)	3	4.7
Bielema, C. L. (1997)	2	3.1
Boone, K. M., Tucker, M., & McClaskey, J. M. (2002)	2	3.1
Bruening, T. H. (1991)	2	3.1
Caldwell, A. E. & Richardson, J. G. (1995)	2	3.1
Connors, J. J., Elliot, J., and Heinze, K. (1991)	2	3.1
Donaldson, J. L. & Thompson, J. S. (1999)	2	3.1
Reisner, A. (1991)	2	3.1
Richardson, J. (1999)	2	3.1
Richardson, J. G. & Mustian, R. D. (1994)	2	3.1
Richardson, J. G., Clement, D. M., & Mustian, R. D. (1997)	2	3.1
Sprecker, K. J. & Rudd, R. D. (1998)	2	3.1
Suvedia, M., Campo, S., & Lapinski, M. K. (1999)	2	3.1
Sweeney, S. & Hollifield, C. A. (2000)	2	3.1
Thomas, R. E. (1996)	2	3.1
Trede, L. D. & Whitaker, S. (1998)	2	3.1

JAC cited additional journals, other than those identified as premier AGED journals, 608 times. The most frequently cited journals were from journalism, communications, and mass communications sources. *Journalism Quarterly* (4.11%) was the most frequently cited journal of all journal citations in *JAC*. A list of frequently cited journals identified 0.66% or more times (excluding the premier AGED journals) is identified in Table 4.

Table 4
Frequently Cited Journals Referenced in JAC from 1997–2006 (n = 608)

Other Journal	<i>f</i>	%
<i>Journalism Quarterly</i>	25	4.11
<i>Journal of Communication</i>	14	2.30
<i>Journalism and Mass Communication Quarterly</i>	13	2.14
<i>Public Opinion Quarterly</i>	13	2.14
<i>Public Relations Review</i>	13	2.14
<i>Science Communication</i>	12	1.97
<i>The American Journal of Distance Education</i>	12	1.97
<i>Agriculture and Human Values</i>	11	1.81
<i>ACE Quarterly</i>	9	1.48
<i>American Journal of Agricultural Economics</i>	9	1.48
<i>Educational Communications Technology Journal</i>	6	0.99
<i>American Journal of Clinical Nutrition</i>	5	0.82
<i>BioScience</i>	5	0.82
<i>Public Relations Quarterly</i>	5	0.82
<i>The Chronicle of Higher Education</i>	5	0.82
<i>AgBioForum</i>	4	0.66
<i>American Behavioral Scientist</i>	4	0.66

A comparison of the most frequently cited journals in *JAC* are identified in Table 5. The *Journal of Applied Communications* (8.52%) was the most frequently cited journal. It was followed by the *Journal of Extension* (4.93%), the *Journal of Agricultural Education* (4.79%), and the *Journalism Quarterly* (3.33%).

The 10-year analysis of *JAC* identified 584 cited books and texts. Books with multiple edition and publication dates are noted in the following table. The most frequently cited book was Dillman's (2000) *Mail and Internet Surveys: The Tailored Design Method*, which was cited in 2.74% of the total books referenced. Additional frequently cited books and texts, identified 0.51% or more times, in *JAC* from 1997–2006, are identified in Table 6.

Table 5

A Comparison of the Most Frequently Cited Journals Referenced in JAC from 1997–2006 (n = 751)

Other Journal	<i>f</i>	%
<i>Journal of Applied Communications</i>	64	8.52
<i>Journal of Extension</i>	37	4.93
<i>Journal of Agricultural Education</i>	36	4.79
<i>Journalism Quarterly</i>	25	3.33
<i>Journal of Communication</i>	14	1.86
<i>Journalism and Mass Communication Quarterly</i>	13	1.73
<i>Public Opinion Quarterly</i>	13	1.73
<i>Public Relations Review</i>	13	1.73
<i>Science Communication</i>	12	1.60
<i>The American Journal of Distance Education</i>	12	1.60
<i>Agriculture and Human Values</i>	11	1.46
<i>ACE Quarterly</i>	9	1.20
<i>American Journal of Agricultural Economics</i>	9	1.20
<i>Educational Communications Technology Journal</i>	6	0.80
<i>American Journal of Clinical Nutrition</i>	5	0.66
<i>BioScience</i>	5	0.66
<i>North American Colleges and Teachers of Agricultural</i>	5	0.66
<i>Public Relations Quarterly</i>	5	0.66
<i>The Chronicle of Higher Education</i>	5	0.66

Table 6

Frequently Cited Books and Texts Referenced in JAC from 1997–2006 (n = 584)

Book and Text	<i>f</i>	%
Dillman, D. A. (2000; 1978). <i>Mail and Internet surveys: The tailored design method</i> (2nd ed.). New York: John Wiley & Sons, Inc.	16	2.74
Rogers, E. M. (1995; 1983). <i>Diffusion of innovations</i> (4th ed.; 3rd ed.) New York, NY: The Free Press.	8	1.37
Miles, M. B. & Huberman, A. M. (1994). <i>Qualitative data analysis</i> (2nd ed.). Thousand Oaks, CA: Sage Publications.	7	1.20
Ary, D., Jacobs, L., & Razavieh, A. (2001; 1990; 1985; 1979). <i>Introduction to research in education</i> (6th ed.; 5th ed.; 4th ed.; 3rd ed.). Wadsworth Publishing.	4	0.68
Boone, K., Meisenbach, T., & Tucker, M. (2000). <i>Agricultural communications: Changes and challenges</i> . Ames, IA: Iowa State University Press.	4	0.68
Merriam, S. B. (1998). <i>Qualitative research and case study applications in education</i> . San Francisco: Jossey-Bass Publishers.	4	0.68
Mueller, D. J. (1986). <i>Measuring social attitudes</i> . New York: Teachers College Press.	4	0.68
DeFleur, M. L. & Ball-Rokeach, S. J. (1989; 1982; 1975). <i>Theories of mass communication</i> (4th ed.; 3rd ed.; 2nd ed.). New York: Longman.	3	0.51
Evans, J. F. & Salcedo, R. (1974). <i>Communications in agriculture: The American farm press</i> . Ames, Iowa: Iowa State University Press.	3	0.51
Fishbein, M. & Ajzen, I. (1975). <i>Belief, attitude, intention and behavior: An introduction to theory and-research</i> . Reading, MA: Addison-Wesley.	3	0.51
Gallup Organization. (2000). <i>Trends in agriculture study: Large producer scorecards</i> . Princeton, New Jersey: Gallup Organization.	3	0.51
Gitlin, T. (1980). <i>The whole world is watching: Mass media in the making and unmaking of the New Left</i> . Berkeley, CA: University of California Press.	3	0.51
Glaser, B. (1978). <i>Theoretical sensitivity</i> . Mill Valley, CA: The Sociology Press.	3	0.51
Morgan, D. L. (1997; 1988). <i>Focus groups as qualitative research</i> . Newbury Park, CA: Sage.	3	0.51
National Research Council. (1988). <i>Understanding agriculture: New directions for education</i> . Washington D.C.: National Academy Press.	3	0.51
Newcomb, L. H., McCracken, J. D., & Warmbrod, J. R. (1993). <i>Methods of teaching agriculture</i> (2nd ed.). Danville, IL: Interstate.	3	0.51
Pedhazur, E. J. (1982). <i>Multiple regression in behavioral research</i> . Fort Worth: Holt, Rinehart and Winston, Inc.	3	0.51

JAC cited proceedings, conferences, and/or meetings 104 times. The most frequently referenced proceeding, conference, and/or meeting was the Agricultural Communicators in Excellence Conference. The conference was referenced more than 17%. The National Agricultural Education Research Conference was identified in 13.5% of the conference citations. Followed by the Southern Association of Agricultural Scientists Conference (9.6%), the International Conference of the International Federation of Science Editors (7.7%), the Southern Agricultural Education Research Conference (5.8%), The Association for Education in Journalism and Mass Communication (3.8%), the International Consortium on Agricultural Biotechnology Research (ICABR) Conference (2.9%), and the International Meeting of Association for Communications Excellence (2.9%).

The 10-year analysis of *JAC* identified other works cited 171 times. The most frequently cited works were newspapers referenced 15.8%. Additional other works cited 1.8% of the time or more, in *JAC* from 1997–2006, are identified in Table 7.

Table 7

Frequently Cited Other Works Referenced in JAC from 1997–2006 (n = 171)

Other Work	<i>f</i>	%
Newspapers	27	15.8
University Manuscript	21	12.3
Unpublished Doctoral Dissertation	21	12.3
Unpublished M.S. Thesis	20	11.7
Unpublished Manuscripts or Reports	18	10.5
Annual or Final Reports	10	5.8
ERIC Documents	9	5.3
Magazines	9	5.3
Census/Government Documents	8	4.7
Newsletter/bulletin	6	3.5
Extension Manuscript	3	1.8
Policy and Laws	3	1.8
Raw Data	3	1.8

JAC from 1997 to 2006 cited websites 122 times. *JAC* relies heavily on citations from non-profit (.org) (32%) and education (.edu) (22.1%); followed by .gov (21.3%), .com (20.5%), and other (.ie .int, .html, .ne) websites.

Conclusions, Discussion and Implications

“Journal analysis can provide a means of assessing key factors that usually indicate the research and publishing characteristics of a profession” (Radhakrishna et al., 1994, p. 64). This study was an

attempt to identify the characteristics of literature cited in the *Journal of Applied Communications*. As stated by Miller et al. (2006), there is a need to track citations and review literature to gain a clear sense of the discipline's research agenda. This study showed an in-depth look into a premier research outlet for agricultural communications in terms of literature cited during a ten year period. Radhakrishna et al. and Garfield (1998) indicated that by identifying a discipline's cited literature base, a framework could be developed to characterize the field of study, define its boundaries and explain how a discipline is interrelated with other fields of study. This study was an attempt to identify the cited literature base in *JAC* and determine its self-identity and compactness.

All research journal articles (N = 91) published in the *JAC* from 1997 to 2006 were analyzed for cited literature. There were a total of 1,732 cited works identified. The average number of citations per article was approximately 19. In articles published in the *JAC*, from 1997 through 2006, it is evident that the discipline pulls from an expansive pool of research works. This study identified 8.26% of the total literature cited was from works published in identified premier agricultural education journals (Edgar et al., 2008). However, journals such as *JIAEE*, *NACTA* and *JOLE* were extremely under-represented or not cited in the literature. Of the 143 literature citations to premier agricultural education journals, *JAC* represented 3.7% of the total citations. This study concludes that *JAC* exhibits weak self-identity, meaning it does little to build upon research previously cited in *JAC*. However, it does not exhibit compactness, indicating that it reaches past its citation boundaries and into inter-related areas of other disciplines.

JAE was identified, in previous research, as the premier journal in agricultural education. Within cited literature represented in *JAC*, *JAE* was referenced about half as much as *JAC*. Does this have implications for the agricultural communications profession? It does imply that *JAC* authors rely most heavily on it and *JAE* for literary works (when looking specifically at identified premier journals). Although previously identified as the second most premier journal in the agricultural education discipline (Edgar et al., 2008), *JIAEE* research was only cited once in referenced literature in the *JAC*. Because of *JIAEE*'s standing, should we as agricultural communication authors strive to cite from this source and published articles in this venue? Similarly, *NACTA* and *JOLE* were also minimally cited in articles published in the *JAC*. It is further concluded that research published from these journals are not used with emphasis or, perhaps, thought. *JOE* was cited more (25.9%) than *JAE* (25.2%) in analyzed *JAC* articles. Approximately 16%, of the total number of citations from *JOE*, stem from a single article by Miller and Smith (1983) discussing non-response research methodology. This same article was identified as the most frequently cited premier agricultural education journal article represented in *JAC* citations. When looking at *JAC* citations of its own published works, there are not predominate works identified. This may be due to relatively few faculty members producing research in multiple contextual areas associated with agricultural communications.

Other journals (not identified as premier in agricultural education) referenced in research published in *JAC* were identified. The *Journalism Quarterly* represented more than 4% of the total journals being cited. References to the *Journal of Communications* (2.3%), *Journalism and Mass Communication Quarterly* (2.14%), *Public Opinion Quarterly* (2.14%), and *Public Relations Review* (2.14%) indicate research authors of *JAC* are using multiple communications and journalism journals to build on knowledge constructs. Not a surprise to most since agricultural communications can be seen as a peer discipline to journalism and communications.

A comparison of journals cited indicated that the *Journal of Applied Communications* was the most frequently cited journal (8.52%), followed by the *Journal of Extension* (4.93%), the *Journal of Agricultural Education* (4.79%), and the *Journalism Quarterly* (3.33%).

Books and text citations are dominated by research methodologies with eight of the seventeen most frequently cited books focusing on research methodologies. Coinciding with this finding, the most common citations from *JAE* and *JOE* were research methodology citations. A large percentage of cited books also focused on communication and mass communication theory and/or media (four of the seventeen most cited books). Conversely, there is a tremendous amount of variety in cited books within *JAC*. This variety is an indication that there are multiple books being cited on a single construct of knowledge. The majority of cited books were from the 1990s or earlier, and this may be affecting the literature relevance of agricultural communications.

Citations referring to conference proceedings and/or meetings are relatively diverse. With the most frequently cited conference being the Agricultural Communicators in Excellence Conference (17.3%); followed by the National Agriculture Education Research Conference (13.5%). Similarly, newspapers (15.8%) and university manuscripts and unpublished doctoral dissertations (12.3% respectively) were the most referenced other works identified in this study (26.9%). It is unclear whether the university manuscripts and doctoral dissertations are being published later as research articles. There were 122 citations to websites. The discipline relies heavily on citations from non-profit (.org) (32%) and education (.edu) (22.1%) websites. How these websites are being used has not been determined; however, it is encouraging that the majority of sites are utilizing extensions associated with trustworthy information.

Literature citations characterize a field of study. Furthermore, they define a discipline's limits and clarify the interrelatedness with other fields of study (Radhakrishna et al., 1994). *JAC* exhibits an expansive cited literature (citationology) reach focusing on multiple disciplinary areas and fields of study. It also exhibits connectedness to most of the identified premier journals in agricultural education. Because of the nature of agricultural communications, it is often necessary for researchers to expand into multiple research outlets, in an effort to find the best "suitable" outlet for their diverse works. This necessity to publish in other venues may be helping to eliminate compactness in agricultural communications literature (specifically in *JAC*). It can be assumed, due to the lack of compactness, that agricultural communications is offering discovery in other fields of study. However, the non-compactness of the citation structure in *JAC* reveals limited published works from within itself and creates weak self-identity. Expanding the quantity of research articles produced annually in *JAC*, and encouraging agricultural communicators to cite from previous articles in *JAC* could help with this issue.

Recommendations

Based on the findings of this study six recommendations have been formed:

1. Further research should be completed to determine the depth of *JAC* citations in other identified premier journals in agricultural education in an effort to further identify the scope and influence of *JAC* on the agricultural education discipline and its literary works.
2. Further research should be completed to better determine how various cited books influence agricultural communications. It would also be important to determine if cited books are seminal or out-of-date works.
3. It may prove valuable to determine if conference proceedings, university manuscripts, and doctoral dissertations progress to permanent literature.
4. Additional research should be completed to determine if this (premier) journal is being cited in other fields of study.

5. This study should be replicated at a ten-year cycle to assess progress the *Journal of Applied Communications*.
6. Additional research should focus on determining what drives citations in agricultural communications. Is it primarily who citers know (social structure) or what they know (intellectual structure)?

About the Authors

Assistant professor and ACE member Leslie Edgar teaches agricultural communication at the University of Arkansas. ACE member Tracy Rutherford, associate professor, teaches agricultural communications and journalism at Texas A&M University. This article is based on a paper presented at the 2009 Agricultural Communications Section of the Southern Association of Agricultural Scientists and the 2009 American Association of Agricultural Education Conference. Minor revisions were made to the manuscript for possible publication in *JAC*.

Keywords

Journal of Applied Communications, cited literature, content analysis, citationology, interrelatedness to agricultural education

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A Nutty Study: A Framing Analysis of the 2009 *Salmonella* Outbreak in Peanut Products

Erica Goss Irlbeck, Cindy Akers, and Ashley Palmer

Abstract

The purpose of this study was to examine television news coverage of the 2009 Salmonella outbreak in peanut products through the scope of framing theory. The aim of this research was to understand how the television news media frame agricultural, particularly food safety, messages. By employing a qualitative content analysis, researchers analyzed television news transcripts from ABC, CBS, CNN, and NBC that aired during the peanut product recall. The frames found from this research were informational, anti-Peanut Corporation of America, and anti-FDA. The most commonly used sources were victims of Salmonella, politicians, and current and former FDA officials. No agricultural frames were present, and the only agricultural organizations interviewed were one representative of the Georgia Department of Agriculture and Ag Secretary Tom Vilsack. The researchers concluded that sources did not appear to have a large impact on the way the news was covered for this study. The researchers also found a need for more scientific food safety information to be communicated to the national media.

Introduction

In early 2009, approximately 1,800 peanut products were recalled because of a *Salmonella* threat originating from Peanut Corporation of America (PCA), which had processing plants in Blakely, GA and Plainview, TX. Ultimately, 654 people were sickened in 44 states, and nine people died because of the bacteria. The investigation tapered off in late March 2009 (Centers for Disease Control [CDC], 2009). PCA manufactured peanut butter and peanut paste that was distributed to numerous food production companies throughout the United States (United States Food & Drug Administration [FDA], 2009). Because the peanut butter and pastes were distributed on such a large scale, numerous food manufacturing companies voluntarily recalled products such as cookies, crackers, ice cream, trail mixes, pet treats, and other food products. In some instances, the recalls were precautionary, and in other cases they were necessary because certain manufacturers had used PCA products. Jarred peanut butter sold in supermarkets was not part of the recall; however, jarred peanut butter sales plummeted by 22%. The United States peanut industry reported losses of around \$3 billion (L. Kennedy, Texas Peanut Producers Board, personal communication, January 18, 2010).

When the news media cover a food safety issue, it can make the public avoid eating the affected food and have a negative impact on the affected industry (Marks, Kalaitzandonakes, Allison, & Zakharova, 2003). Media coverage of a food recall is not always negative toward the agricultural industry, but by analyzing the frames the media present, agricultural communicators can determine more effective and more important messages when communicating with the public or directly with the media on agricultural or food safety issues.

Conceptual and Theoretical Framework

Salmonella is a naturally occurring bacteria typically found in meat, poultry, raw milk, eggs, and fresh produce (Mideiros, Hillers, Kendall, & Mason, 2001). Plant-based food products can become contaminated with *Salmonella* if fecal matter is near the plants or in the water used to irrigate (CDC, 2005). Symptoms of *Salmonella* poisoning include diarrhea, abdominal cramps, and fever (CDC, 2005). *Salmonella* can be present on raw peanuts, but at the processing facility, the roaster kills the bacteria; therefore, once the nuts are roasted, they should be bacteria free (National Peanut Board, 2009). However, FDA inspectors found evidence at both the Georgia and Texas processing facilities that the bacteria were present in places that could have contaminated the products after roasting (FDA, 2009).

Although the CDC reported that illnesses occurred as early as September, confirmation of the bacteria's location was not confirmed until January 9, 2009, when a Minnesota Department of Health laboratory found *Salmonella* in a five pound container of peanut butter (National Peanut Board, 2009). King Nut was the first company to issue a recall; however, the company announced it was simply the distributor, and the peanut butter was manufactured by PCA (National Peanut Board, 2009). PCA issued a nationwide recall of the peanut butter it manufactured, and on January 17, FDA announced that consumers should avoid all products that may contain peanut butter because the agency was uncertain which manufacturers used PCA products (National Peanut Board, 2009). Days later the FDA announced that product samples from the company's Blakely, GA plant contained *Salmonella*. On February 9, PCA closed its Plainview, TX facility when the Texas Department of Health found a possible presence of *Salmonella* in products (National Peanut Board, 2009). "When PCA took it (the peanuts) out of the roaster—the roaster is your kill step because it's got such high temperatures—somehow after that step, it was contaminated. So it wasn't the farmer, it wasn't even the sheller. It was that one manufacturer" (S. Nutt, Texas Peanut Producers Board, personal communication, February 25, 2009). In early February, an investigation revealed that roaches and rodents, along with a leaking roof, were found in PCA's facilities. PCA filed for Chapter 7 bankruptcy on February 13 and closed its third and final operating plant in Virginia (National Peanut Board, 2009).

News Coverage of Food Safety/Agricultural Issues

It is more common for framing analyses in agricultural communications research to be conducted using print media. However, a study analyzing the national television news networks' framing of the 2008 *Salmonella* outbreak in jalapenos found anti-government and anti-Mexican produce imports frames, but pro-agricultural producer frames (Irlbeck & Akers, 2009). The study concluded that news coverage of the outbreak was mostly based on the facts that were available at the time; however, certain networks provided opinion and speculation about the source of the bacteria, and one network frequently and blatantly placed blame for the outbreak on the United States government (Irlbeck & Akers, 2009). A similar framing study on the 2008 *Salmonella* outbreak in jalapenos found that national reporters had strong supportive feelings toward the agricultural producers, they hoped for policy changes at the FDA, and they felt the United States' food supply was safe (Irlbeck, 2009). The study concluded that "in some instances, television news frames are influenced by the reporters' attitudes and ideologies, and in other instances, they are not" (Irlbeck, 2009, p. vii).

The Food Policy Institute at Rutgers University also studied public reaction to the 2008 *Salmonella* outbreak and found great awareness of the situation, but great confusion among consumers concluding that although the FDA frequently posted information about newly recalled products,

consumers did not continue checking their kitchens to see if they had the recalled product (Cuite, Schefske, Randolph, Hooker, Nucci, & Hallman, 2009).

Other framing analyses have found mixed attitudes toward agricultural producers. A study on the U.S. mad cow outbreak found that American newspapers framed the story as high risk to humans, while Canadian newspapers focused on the disaster for Canadian agriculture (Ruth, Eubanks, & Telg, 2005). A similar study found that U.S. newspapers presented a negative frame toward the beef industry (Ashlock, Cartmell, & Kelemen, 2006). Another study on the same topic found that news coverage of the mad cow crisis was mostly objective with a few judgment statements that were negative toward agriculture (King, Cartmell, & Sitton, 2006).

During a prominent food safety story, activists groups were quoted in the media five times as often as food scientists (Anderson, 2000). Eyck (2000) argued that activist groups “develop strategies to gain the media limelight around food safety issues for the purpose of gaining public support for their continued existence” (p. 45). However, other studies (Ashlock et al., 2006; Irlbeck & Akers, 2009) found that government or FDA officials were used frequently as interview sources.

Many food scientists may be uncomfortable providing interviews for reporters, as most scientists have not had media spokesperson training (Anderson, 2000). Yet scientists can provide a wealth of scientific information. Eyck (2000) suggested that scientists and the agricultural communicators who frequently work with scientists should seek out the media to become a known and consistent source of information.

Framing Theory

This study was guided by the top half of Scheufele’s (1999) model of framing effects (see Figure 1) and analyzed the outcomes, or media frames, that were presented by national television networks during the 2008 *Salmonella* outbreak. Since sources, or as Scheufele called them, “other elites,” can influence the tone and frames presented in a story (Baran & Davis, 2009), the sources used by the networks were also analyzed in this study.

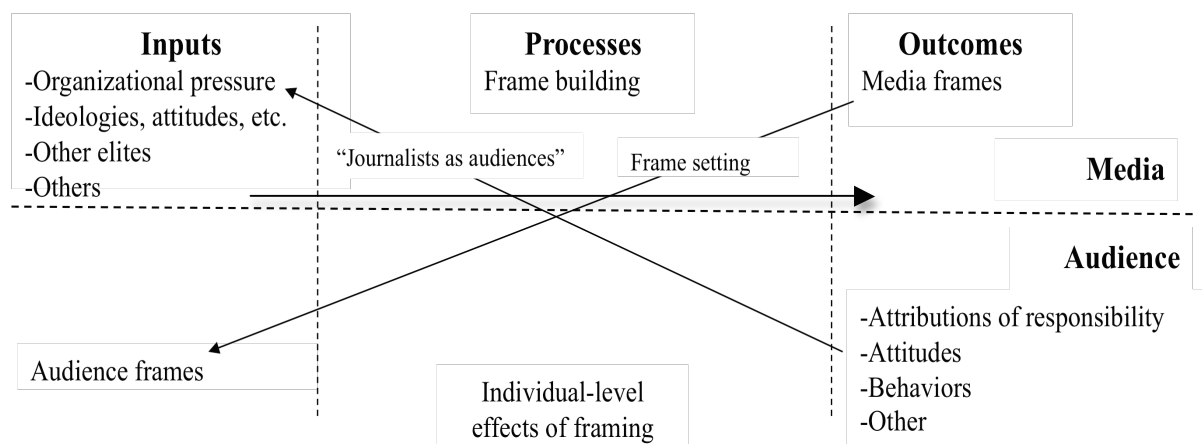


Figure 1. Model of framing effects (Scheufele, 1999).

Framing is not a negative thing; a frame is simply how a reporter tells a story (Irlbeck & Akers, 2009). Framing theory is “a central organizing idea or story line that provides meaning to an unfolding strip of events” (Gamson & Mogdigliani, 1987, p. 143). Journalists pick certain elements of a story and write them in a manner that places more importance on those portions of the story (Entman, 1993). A frame is not necessarily intentionally written; instead, influences from the news

organization's management, interview sources, personal opinions, and professional judgment lead a reporter to write a story a certain way (Neuman, Just, & Crigler, 1992).

For a food safety story, Irlbeck and Akers (2009) explained that a reporter could present a frame of warning that lets the public know that a health threat has been found and how to avoid it, or the reporter could interview a victim so that the viewers understand how harmful the bacteria can be. Station management may think that viewers want information about keeping children safe; therefore, the organization can influence the frame. Weaver and Wilhoit (1991) argued that reporters do not have time to actively craft and promote frames—most reporters want to get the information out as quickly as possible.

Purpose and Objectives

The purpose of this study was to examine television news coverage of the 2009 *Salmonella* outbreak in peanut products through the scope of framing theory. The aim of this research was to understand how the television news media frame agricultural, particularly food safety, messages. If agricultural communicators have a better understanding of media framing, they can create and promote more efficient and targeted messages to national television news outlets. This study replicated the Irlbeck and Akers (2009) study where news transcripts from the 2008 *Salmonella* outbreak in jalapenos were evaluated; therefore, the research objectives for this study were very similar:

1. Determine how the 2009 *Salmonella* outbreak was framed by ABC, CBS, CNN, and NBC.
2. Determine how the sources used by individual networks played into the framing of the issue.

Since Irlbeck and Akers (2009) examined transcripts from ABC, CBS, CNN, and NBC, this research did the same. A limitation of this study was a lack of video analyzed. The outbreak occurred in early 2009, and the researchers began the study in August 2009. By that time, many news organizations had removed video clips from their Web sites, and obtaining tapes of the broadcasts was cost prohibitive.

Method

This study was a qualitative content analysis and replicated an Irlbeck and Akers (2009) analysis of news transcripts during the 2008 *Salmonella* outbreak in jalapenos. The researchers conducted a search for television news transcripts with the keyword "*Salmonella*" between the dates of December 1, 2008 and April 1, 2009. The stories were aired in January and February, but the researchers added an extra month to both sides of the search in order to catch any stories that may have aired well before or well after the story became a full-fledged news event. Transcripts from ABC, CBS, CNN, and NBC were gathered using the Lexis-Nexis search engine through the university library. At the time of the study, only the aforementioned networks' transcripts were available through Lexis-Nexis. A total of 107 stories were collected; however, five stories were duplicated and one story was a spoof and not necessarily news; therefore, the data set was reduced to 101. Each story was analyzed.

The researchers used the coding sheet and categories from the Irlbeck and Akers (2009) study. Their coding sheet included network name, word count, air date, sources, overall tone (positive, negative, or neutral), and prominent frame(s). Each researcher coded scripts independently then met to reach consensus to work out any discrepancies (Krippendorff, 2004). Accountability was maintained with an audit trail of the news transcripts and coding spreadsheets (Irlbeck & Akers, 2009). The

researchers wrote self-reflexive notes to themselves to further aid in data analysis. ABC News aired 30 stories, CBS aired 31 stories, CNN aired 11 stories, and NBC aired 29 stories.

Findings

ABC, CBS, and NBC typically ran shorter format stories. The majority were readers, a story read by the anchor without video; or a voice over, a story with the anchor reading while corresponding video plays. The networks commonly aired live interviews with a victim or an expert on the story. CNN tended to air longer format stories. The anchors and reporters offered a more conversational report, and speculation and opinions frequently infused the banter.

Findings in Relation to Research Objective 1

Research Objective 1 sought to determine how ABC, CBS, CNN, and NBC framed the 2009 *Salmonella* outbreak. After analyzing each transcript, the researchers determined that the reporting was fair and unbiased, with a few exceptions. The majority of frames presented were informational or warning with a neutral tone (see Table 1), but some frames had a negative tone, usually toward PCA or the FDA. A keyword that was found in many stories was “avoid”—which was informational to the viewers so they would know which products could possibly contain the tainted peanut product. All four networks, on numerous occasions, reported the number of people who were sick and deceased from the bacteria. There was a noticeable shift in tone on each network in late January. ABC and NBC shifted from a neutral, informational tone to a negative tone on January 24, 2009, CBS shifted to negative on January 20, 2009, while CNN started with a negative tone toward the FDA with the first story which aired on January 8. Then the network switched to a neutral, informational tone and then shifted back to negative on January 28.

Table 1
Frames listed by tone and network

Frames	ABC			CBS			CNN			NBC			Total
	+	-	Nu	+	-	Nu	+	-	Nu	+	-	Nu	
Information/ Warning			16		4	16		2	2		1	20	61
PCA		14			12				6	1	6	2	41
FDA/Gov't/ Regulatory		7			8		1	5			4	1	26
Food manufactures		1		1	1			2					4
GA Dept. of Ag		1						1			1	1	4
Peanuts/peanut butter/industry				2	3								4

Note. + means supportive; - means negative; and Nu means neutral.

Although many of ABC's stories were negative toward PCA, they were fairly straightforward and mostly reported on the findings of the FDA's investigation. The researchers found one opinion-

ated comment when the anchor reported that peanut butter was still considered a safe product, but then added “no parent is going to go near that”—referring to peanut butter.

CBS offered different information that was not reported by other networks. For example, the network twice reported on Peanut Corporation of America’s operations, explaining that the company did not sell jarred peanut butter, rather the company provided bulk peanut butter and peanut paste to other companies to be mixed into various food products. They explained the difference between peanut butter and peanut paste, a source of confusion for many consumers. After analyzing the story, the researcher wrote in her self-reflexive notes, “this was pretty responsible reporting. It was a good way to clear up a lot of confusion over the recall.” When results of FDA’s investigation of the PCA plant were released, CBS provided the most explicit details of the findings. The network also reported that PCA owner Stewart Parnell was on the USDA Peanut Standards Board—information that no other network provided. The researcher’s notes also stated “CBS seems to have done the best job reporting.”

However, CBS also reported the peanut products that were being recalled were “foods you should not be eating anyway.” CBS also reported that PCA used contaminated peanuts, which had not been reported anywhere else and was not true. Several of CBS’s stories were a little confusing with contradictory statements on which products to avoid. For example, in one story they stated that consumers should stay away from anything containing peanuts, whereas another story provided information on which specific products to avoid. There was also an instance during a live interview where the news anchor appeared to be leading and taking the side of the interviewee.

CNN began its coverage with a negative report on the FDA stating that the agency was “wasting money.” On January 9, CNN reported the source of the contamination was “still a mystery,” even though that was the day the Minnesota Departments of Health and Agriculture announced finding *Salmonella* in a container of peanut butter. The next day, however, the network reported accurate, detailed information. In another story, CNN reported that jarred peanut butter was safe, but in the same story warned “just don’t eat it (peanut butter).”

As late as January 18, CBS and NBC were telling viewers to avoid peanut butter, even though other networks were naming the specific products that were recalled. With that exception, NBC’s coverage of the recall was straightforward with no reporter opinions or speculation. NBC presented a frame that was supportive of PCA’s employees, explaining how 50 people were now without jobs. The network was the only network that offered information on the economic impact the recall had on the peanut butter industry. NBC was also the only network to interview a United States Department of Agriculture official. NBC followed the story to the end, telling the viewer the fate of Peanut Corporation of America when the company filed for bankruptcy.

The researchers, who both have agricultural backgrounds, noticed that no network provided a frame about farmers.

Findings in Relation to Research Objective 2

Research Objective 2 sought to determine how the sources used by individual networks played into the framing of the issue. For this story, victims or victims’ family members were the most popular interview source (see Table 2). Politicians were the second most popular.

Jeff Almer, a Minnesota resident, lost his mother to the *Salmonella* poisoning. Of all the victims or family members, he was interviewed the most—eight times between CBS, CNN, and NBC. CNN re-ran some of his same sound bites in different newscasts.

Table 2
Number of interviews listed by company or source type

	ABC	CBS	CNN	NBC	Total
Victim/Victim's family member	3	12	3	3	21
Politicians	10	2	4	0	16
FDA	4	4	3	2	13
Medical professional/doctor/dietician	2	1	3	5	11
PCA	6	3	0	0	9
Former FDA officials	0	4	3	0	7
Special interest/watchdog groups	3	1	1	1	6
Attorney	2	1	0	1	4
PCA customer	1	2	0	0	3
CDC	0	0	2	0	2
Food safety expert	1	0	0	0	1
GA Dept. of Ag.	0	0	0	1	1
Consumer	1	0	0	0	1
Former HHS officials	0	0	1	0	1
Tom Vilsak (USDA)	0	0	0	1	1
Chef	0	1	0	0	1

Democratic Congressman Bart Stupak of Michigan was interviewed five times. Stupak is the Chairman of the Subcommittee on Oversight and Investigation through the House Committee on Energy and Commerce. Representative Henry Waxman (D) of California was interviewed twice; he is the Chairman of the House Committee on Energy and Commerce. Congressman Greg Walden (R) of Oregon was interviewed three times; he is the vice chair of the Subcommittee on Oversight and Investigations. According to the subcommittee's Web site, its responsibility is to oversee agencies and conduct investigations within its jurisdiction. The FDA falls within this subcommittee's jurisdiction (Subcommittee on Oversight and Investigations, 2009).

Since the FDA spearheaded the investigation, its officials were an obvious choice for an interview source. The researchers noticed a strong presence from former FDA officials, who gave seven interviews, William Hubbard four times and David Kessler three times.

Eleven medical doctors or dietitians were used as interview sources. The information they provided was unbiased and accurate, with one exception. A physician that NBC used as a source speculated that the contamination was likely due to raw egg. This was information that was not reported anywhere else, and there is no evidence of this information on the FDA's Web site, so the researchers assumed the source was speculating.

The interviews from PCA came from former employees. Several networks pulled sound bites from PCA owner Stewart Parnell's testimony in front of Congress; however, Parnell's only comment was stating that he declined answering every question under the advice of his lawyer.

The use of consumer watchdog or special interest groups as sources varied by network. The Center for Science in the Public Interest was the most popular group—ABC interviewed a spokesperson three times and NBC once.

NBC was the only network to interview USDA Secretary Tom Vilsak. No network interviewed a peanut producer.

Conclusions and Discussion

Media coverage of a food recall is not always negative toward the agricultural industry, but by analyzing the frames the media present, agricultural communicators can have a better understanding of media framing, and they can create and promote more efficient and targeted messages to national television news outlets. Although the researchers noticed that no one interviewed a peanut grower, nor did any network present the frame of the farmer, peanut producers were not implicated at all by the national television media during the 2009 *Salmonella* outbreak. This was probably because peanut producers were not at fault, and the FDA's investigations clearly indicated that the blame was on the Peanut Corporation of America. However, it was curious that agriculture was not a part of this story when agricultural producers played such a big role in the television coverage of the 2008 *Salmonella* outbreak in jalapenos (Irlbeck & Akers, 2009), and the peanut industry lost as much, if not more, revenue than the tomato industry did in the 2008 *Salmonella* recall.

An objective of this study was to determine how the television news networks framed the 2009 *Salmonella* outbreak. A frame is simply how a reporter tells a story. Certain factors such as personal ideologies, corporate policy, or information sources may influence the way the reporter processes the information to tell the story (Scheufele, 1999), but the objective of this study was not to determine what factors influenced frames, but to simply determine how the networks told the story.

The most common frame was informational. Many stories were brief, telling viewers which products to avoid or how to lower the risk of *Salmonella* poisoning, and many stories referred the viewer to the FDA's Web site for a complete list of recalled products. However, consumer research found that after hearing about a food recall, consumers typically do not continue checking to see if they have a contaminated product (Cuite et al., 2009).

The vast majority of the stories about PCA were negative, but this was no surprise. The FDA found the corporation to be in the wrong, and the media were presenting the information the FDA offered, which was negative toward PCA.

Many stories had a negative tone toward the FDA or the U.S. food regulation system. This corresponds with the findings of Irlbeck and Akers (2009) where the media negatively framed the FDA

during the 2008 *Salmonella* outbreak in jalapenos. Although the FDA seemed to locate the source of the bacteria in 2009 much faster than in the 2008 investigation, several stories were negative about the regulation and self policing system that is currently in place, and other stories were rhetorically asking why the story continues to happen so frequently.

The process of a foodborne illness followed by a food recall is complicated, and during the 2009 recall, several networks explained the process of a recall, and one network explained how PCA operated. CNN provided an especially detailed explanation of an FDA foodborne illness investigation. The researchers concluded since CNN offers news 24 hours a day, the network had more time than non-cable networks to go into detail on such stories. The network also provided a more conversational feel to its stories, and this was likely due to the longer format.

Although few opinionated comments and errors were detected from reporters, the researchers found the vast majority of the reporting to be responsible and accurate. In all, the story was generally reported either with an informational, anti-PCA, or anti-FDA frame.

This research also sought to determine how the interview sources used by individual networks played into the framing of the issue. Sources can influence the frame of a story (Baran & Davis, 2009). Previous research found that activist groups were quoted far more often than food scientists, and government officials were common sources in a food recall situation (Anderson, 2000; Eyck, 2000; Irlbeck & Akers, 2009). Current and former FDA officials were used on 20 different occasions during the 2009 *Salmonella* outbreak, but that is to be expected since the FDA managed the recall and investigation of PCA. Contradictory to the previous research, special interest or activist groups were only used on six occasions during this story, while medical professionals or dietitians were used on 11 occasions. At the same time, only one food scientist was interviewed. For one live interview, CBS interviewed Bobby Flay, a celebrity chef and contributor to the CBS Early Show. Flay explained how to prevent the spread of *Salmonella*. Although Flay's information was accurate, the researchers found it odd that a celebrity chef was providing information on safe food handling when a food scientist could have been interviewed. If an agricultural communicator works with a food scientist, there is an opportunity to promote the experts they work with to various local and national reporters (Eyck). Irlbeck (2009) found that national and local reporters are receptive to and welcome food scientists, but many reporters simply do not know about or do not have contact information for these experts.

As stated earlier, special interest groups were not used as frequently as they were in the television news coverage of previous food recalls (Irlbeck & Akers, 2009). However, the researchers noticed that Jeff Almer, a Minnesota man whose mother died from the bacteria, was interviewed on eight different occasions. After an Internet search, the researchers found that Almer is now representing Safe Tables Our Priority, an consumer activist group, and spoke on behalf of victims at a Congressional hearing and in several press interviews (U.S. House of Representatives, 2009; Huddleston, 2009). Even though the interest groups were not as commonly interviewed during the 2009 food recall, this victim was speaking for an activist group, but was not described or identified as such. Another finding was that CNN used Almer on three occasions, and once repeated a sound bite; he was the only victim or family member of a victim interviewed on CNN. In an interview for a research study, a network reporter said this about frequently re-using sources: "We try actually not to interview the same players for every story because that's not great reporting" (Irlbeck, 2009, p. 108).

Although many sources spoke out against FDA, PCA, food manufacturers or the Georgia Department of Agriculture, the data do not indicate that the interview sources had a powerful influence

over the frames presented in the 2009 Salmonella outbreak. The majority of the stories were neutral and informational; therefore, in this instance, it did not appear that sources or other elites (Scheufele, 1999) shaped the frames presented.

Recommendations for Practitioners

Only one food scientist was used on four networks during a story that was on the air for two months. Again, the opportunity is present for agricultural communicators to promote food safety experts to both national and local media. Eyck (2000) recommended that agricultural public relations practitioners work with food safety experts to help develop relationships with the media. Often, the media are unaware of an expert source, or they may be too busy to seek out a new source as indicated by a national reporter: “It would be very helpful if someone contacted me and said ‘Hi, I’m the media relations person for the agricultural department at (a university), we’ve got these experts’... (that would be) extremely helpful. Because we’re based in D.C., and all news does not happen in D.C., particularly when it comes to food safety” (Irlbeck, 2009, p. 136).

Recommendations for Future Research

An unanswered question from this research is “why were peanut producers not interviewed by network reporters for this story?” Agricultural producers were a major frame in the 2008 *Salmonella* outbreak in jalapenos (Irlbeck & Akers, 2009), but were not present at all in the peanut product recall. An investigation into reporters’ choices of sources may yield answers to this question. Studying reporters’ attitudes and opinions about the story could also contribute to the “inputs” portion of Scheufele’s (1999) framing effects model.

Researching the communications strategy of peanut commodity groups, peanut processors, and food companies that experienced the 2009 recall, both before and after the recall, could lead to guidelines for communications practitioners that are preparing crisis communications plans.

Retail sales for jarred peanut butter have completely recovered from the recall, but the supply of peanuts is still abundant due to a large crop in 2008 (Lepicier, 2009). Researchers have considered a national survey to determine if consumers still trust peanut products other than peanut butter.

About the Authors

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Keywords

framing theory, peanut recall, food safety, television news, agriculture in the media, content analysis.

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Managing Media Relations: Determining the Reputation of a Land Grant Institution from Perspective of Media Professionals

Lauri M. Baker, Katie Abrams, Tracy Irani, and Courtney Meyers

Abstract

In recent years, the land grant university has struggled with public awareness outside of its traditional audiences, indicating a potential disconnect between the general public and the media. The purpose of this study was to assess the perceptions and awareness of media with regard to the image and reputation of the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS). A sample of 150 state and local media professionals was surveyed to assess perceptions and awareness of UF/IFAS. The results indicated that the media's perceptions of UF/IFAS image and reputation were positive, but their awareness of the institution's range of program areas was low. Media professionals consider the information provided by UF/IFAS to be credible, useable, and newsworthy. Respondents said the environment, followed by disaster preparation and recovery were the most important topics to their target audience, while the least important topics to their target audience were 4-H youth development and agriculture. Media professionals were more likely to use UF/IFAS as a source for agriculture and natural resource topics than other topics. Other universities should consider conducting similar research to develop a body of knowledge on media relations at land grant institutions.

Introduction

The mission of the land grant university is to provide education, research, and public outreach (extension) for the citizens in its state. Traditionally, the role of transferring the research information and technology generated via the land grant and its tripartite mission has fallen to the Cooperative Extension Service. The Smith-Lever Act of 1914 created extension to assist in diffusing useful and pragmatic information to the people of the United States (Rasmussen, 1989). Since the early 19th century, however, face-to-face transfer of information from the land grant has been augmented by mediated channels of communication, ranging from print and broadcast media to the Web. In response to the need to communicate effectively using multiple channels, land grants have developed "communications service units" staffed by public information specialists, writers, and videographers, whose job it is to help shape communications and information/education efforts. In county extension offices, agents contribute to this trend by increasingly making use of local media to promote their programs and events (Telg, Irani, Hurst, & Kistler, 2007), and in many cases are able to reach larger audiences through local newspaper columns, public affairs shows, Web sites and the like. While some of this communication is placed as advertising, the vast majority is targeted toward media outlets in the form of press releases, public service announcements, features, and news stories (2007). Although the literature has focused on land grant communications from the marketing and

branding standpoint, little research exists that looks at the effectiveness of land grant public relations in general, and media relations in particular.

The modern land grant institution faces many challenges to define itself in terms of new and non-traditional audiences for its services. As more Americans move away from rural areas and agricultural production systems, land grants have kept up with the pace of societal changes by diversifying program areas to better serve urban and suburban citizens. Today, in addition to agriculture, land grant program areas are targeted to include the environment, families and consumers, home horticulture, sustainable living, disaster preparation and recovery, and youth development. As these institutions have diversified in terms of program areas and stakeholder demographics, however, awareness and understanding of the land grant mission has dwindled (Kellogg, 1999).

In response to decreased awareness and potential budget cuts, land grants have scrambled to demonstrate their value and accountability through the name branding and marketing of their services. For example, the University of Florida brands itself as the Institute of Food and Agricultural Sciences, or “IFAS”, which was conceived in 1964 to demonstrate the link between the three parts of the land grant mission. Other land grant institutions have also created a brand name to develop a brand identity and establish an institutional reputation with new and existing publics. Oklahoma State University, for example, has its Division of Agricultural Sciences and Natural Resources (DAS-NR), Texas A&M University has AgriLIFE, and Louisiana State University has the AgCenter. Land grant branding is intended to mirror corporate marketing communication models by creating a brand to differentiate services and generate memorability and preference. But, given the lack of budgetary resources needed to generate brand awareness through marketing mechanisms, sole reliance on these efforts is likely to be of limited effectiveness without an approach that leverages the potential impact of public relations.

Literature Review

Excellence in Public Relations Theory

Certainly, public relations and marketing are both essential to organizations, but public relations scholars argue that although they may be complementary, they are separate functions, each bringing distinct perspectives to an organization (Grunig & Grunig, 1998; Grunig L. A., 1997). When either public relations or marketing is emphasized more than the other, the organization may “end up ‘speaking with one voice’ (often a rationale for integrating marketing, advertising, and public relations), but it is able to listen with only one ear” (Grunig L. A., 1997, p. 291). Marketing primarily focuses on one-way communication, supplemented with two-way communication that occurs only with customers or clients. Effective public relations involves developing relationships not only with clients, but also with strategic constituents, called “publics,” such as governmental agencies, the mass media and trade presses, financial publics, the employees, and special interest or activist groups (1997). This description suggests that the ideal foundation of public relations is, and should be, rooted in two-way symmetrical communication between the organization and its publics. However, this is difficult to achieve, especially in the instance of public relations efforts on behalf of public institutions such as land grants because of the large amount of people involved in communication efforts, often in multiple locations throughout the state.

Grunig and Hunt (1984) defined four models of public relations—press agency; public information; two-way asymmetrical and two-way symmetrical. The two most relevant models to this study are the public information model and the two-way symmetrical model. The public information

model is characterized by the use of press releases and other one-way communication techniques to distribute organizational messages through in-house journalists. The two-way symmetrical model uses research with publics to facilitate understanding and communication, whereas a two-way asymmetrical model (highly characteristic of marketing) uses research to determine the messages most likely to persuade publics (as cited in Grunig & Grunig, 1992). The long-standing assertion in the field of public relations posited by Grunig and Grunig is that “organizations should practice two-way and symmetrical communication when their environments are complex and turbulent” (p. 298).

Because land grant institutions are public sector organizations with multi-faceted goals (teaching, research, and extension) and extremely diverse stakeholder groups, they are naturally inclined to rely more on the public information model. However, to improve outreach and increase accountability, as recommended by the Kellogg Commission (1999), land grant universities may need to more fully embrace two-way communication approaches based on needs-assessments with publics and issues-based program development (Donnellan & Montgomery, 2005).

Media Relations

A critical function of public relations is maintaining good relationships with relevant media organizations. Organizations utilize public relations in order to leverage the credibility of the news media to target publics with messages that promote goodwill. “Good press” arises as a result of an organization’s engaging in media relations activities that enhance the potential for positive coverage in the news media. Schenkler and Herrling (2003) stated that these types of media relations efforts are vital for two reasons. The media can affect an organization’s reputation positively or negatively. The reputation of an organization formed and held in memory by a stakeholder as informed through the media “serves as the ‘reality’ of the organization for that individual” (Brown, Dacin, Pratt, & Whetten, 2006, p. 105). Additionally, the media can be the most direct and available channel to reach clientele, influence the opinions of legislators, motivate employees, and enhance/defend organizational reputation (Schenkler & Herrling, 2003). Conversely, while working to establish a strong reputation, an organization should also consider ways to enhance their brand name and credibility (Fill, 2002). Media professionals certainly desire to be viewed as credible, and thus consider the credibility of their sources when crafting a story. If they tie source credibility to a specific organization’s brand name and reputation, they may return to that organization for credible information in the future.

Effective media relations involves knowing and anticipating the needs of the media. Media professionals have numerous “feelers” out to capture and convey information of interest to their target audiences. They speak with co-workers and trusted sources, observe news wires, and sort through numerous press releases (Schenkler & Herrling, 2003). “In theory, journalists and sources have a symbiotic relationship: sources require journalists to get their views or ideas into the news, while journalists require sources for direction, clarification, context, perspective, and commentary. In reality, ... journalists rely more on sources than vice versa” (Conrad, 1999, p. 286). Historically, journalists have mistrusted public relations practitioners as sources, deeming that they selfishly push the goals of their respective organization or conceal negative information (Ryan & Martinson, 1988). To build positive relationships with the media, organizations must be honest and open, provide accurate information, be responsive and timely, reliable and consistent, and prepared (Desiere & Bey-Ling, 2007).

Purpose & Objectives

The potential media relations problem for land grant institutions is not that they do not have the

characteristics recommended by Desiere and Bey-Ling (2007), but the media, like other stakeholder groups, may not be aware of the functions and range of issues covered by these institutions. The purpose of this study was, therefore, to assess the perceptions and awareness of media with regard to the image and reputation of a land grant, the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS). This institution was chosen for two reasons. First, UF/IFAS has engaged in a recent multi-year effort to improve its brand image and identity using primarily corporate marketing techniques (Meyers, Irani, & Eckhardt, 2006). Secondly, the data in this study was part of a larger data collection effort that assessed perceptions of brand image and awareness of producers and community leaders (Chodil, Meyers, Irani, & Baker, 2008). Although data was collected on some items common to all three groups, media professionals were additionally asked specific items related to source credibility and information channel preferences with a view toward understanding how these perceptions could potentially shape the media relations dynamic. Based on the above, the following research objectives were developed to guide this study:

- Determine state media professionals' awareness of UF/IFAS and its teaching, research, and extension components;
- Determine state media professionals' preferred source and information channels with respect to agricultural and natural resources related news;
- Investigate state media professionals' perceptions of UF/IFAS as an information source.

Methodology

A descriptive telephone survey methodology was utilized to determine levels of awareness and perceptions of state media professionals. The sampling frame was developed to collect data from representative samples of media professionals statewide based on the type of media outlet in which they were employed. Lists of names were developed from several existing data sources and then sampled using a stratified random sampling technique. These data sources included multiple lists of media contacts and purchased media directory listings for print and broadcast news media.

This study utilized computer assisted telephone survey methodology to collect data from the samples. Interviews were conducted by the University of Florida's Survey Research Center using the CATI system. Trained telephone interviewers followed a researcher-developed questionnaire. Interviewers read the questions directly from the computer screen to ensure consistency. Interviewers contacted the media representatives between the dates of December 17, 2007, and January 9, 2008. There were 460 media professionals in the sample and 1527 calls were made, including up to six call-backs. The media professionals who completed the survey totaled 150 for a response rate of 32.6%.

To conduct the study, a 25-item survey questionnaire was developed using questions from previous surveys of UF/IFAS stakeholders and a national study of extension awareness (Warner, Christenson, Dillman, & Salant, 1996; Chodil et al., 2008). Items included a series of questions focusing on awareness and perception of UF/IFAS. Questions were also asked regarding the image and reputation of UF/IFAS, and preferred method of receiving information. The instrument was reviewed prior to being implemented by a panel of experts, which included representative media professionals who were not part of the survey population, for face and content validity. The instrument took into consideration the uniqueness of the media and their interactions with their target audience to adapt the questions for this audience. Data were analyzed in SPSS 16.0 to generate descriptive frequencies and means.

Media Demographics

Media Professionals

The majority of the media professionals were male (58.7%, $n = 88$) and white (90.7%, $n = 136$). The average age of study participants was 46. The majority of respondents (58%, $n = 87$) attained a four-year bachelor's degree. The next highest percentage (19.3%, $n = 29$) attained a graduate/professional degree. Nearly 17% (16.7%, $n = 25$) of respondents were University of Florida alumni. Only 2% of the media professional were alumni from the university's College of Agricultural and Life Sciences.

Organizational Characteristics

The media professionals surveyed worked for a variety of types of media, and in some cases, for more than one type of media outlet (which caused the following percentages to total greater than 100%), with the largest percentage working for a newspaper at 74% ($n = 111$) and the smallest percentage working in radio (7.3%, $n = 11$). Nearly half of the respondents worked for an online publication (48%, $n = 72$). Approximately 15% worked for a magazine (16.7%, $n = 25$) or a television station (14.7%, $n = 22$). The circulation size of the print media ranged from 1,800 to 700,000 (median=12,000). The majority of the printed publications were printed either daily or weekly at 66% ($n = 99$). The online publications had from 5 to 7,000 users, although only 4% ($n = 6$) of the online publications required a membership to view them. Radio listeners ranged from 70,000 to 25,000,000 (median=110,000) and television viewers ranged from 36,000 to 596,000 (median=130,000). The primary coverage area of the media was either city or urban, which totaled 50% ($n = 75$) and the smallest coverage area was suburban at 6.7% ($n = 10$) (see Table 1).

Table 1
Primary Coverage Area of Media Respondents

	<i>n</i>	Percent (%)
Rural	29	19.3
Small town	26	17.3
City	33	22.0
Urban	42	28.0
Suburban	10	6.7
Don't know	6	4.0
Refused	4	2.7
Total	150	100

Results

Objective One: Determine state and local media professionals' awareness of UF/IFAS and its teaching, research, and extension components

Respondents were asked a series of questions to determine their level of awareness of the University of Florida, then UF/IFAS, and finally the program areas on which UF/IFAS focuses. The

majority of media respondents (58.7%, $n = 88$) were either very or somewhat familiar with UF/IFAS' research, education, and extension work. When asked how many times in the past six months they covered a story in which they used UF/IFAS as a source, 43.3% ($n = 65$) said they used UF/IFAS as a source between one and seven times. Ten percent ($n = 21$) said they used UF/IFAS as a source 10–24 times in the past six months.

When respondents were asked how generally informed they were about the research, education, and public service activities of the University of Florida, the majority, 58.7% ($n = 88$) reported they were either somewhat or very informed. However, when asked unaided (not given a list of choices) what organizations in Florida conduct research and/or provide information about food, agriculture, and natural resources, only 14.7% ($n = 22$) of media said the Institute of Food and Agricultural Sciences.

If respondents did not mention UF/IFAS unaided, they were then prompted as to if they had ever heard of UF/IFAS or the University of Florida's Institute of Food and Agricultural Sciences. This resulted in a greater percentage of awareness, with 35.3% ($n = 53$) of media indicating they had heard of UF/IFAS.

Respondents who expressed aided awareness of UF/IFAS (35.3%, $n = 53$) were then asked on what program areas UF/IFAS focuses (see Table 2). The greatest level of awareness was of agriculture and lawn and garden program areas.

Table 2

Media Respondents' Awareness of UF/IFAS Program Areas (Unaided)

Topic	<i>n</i>	Percent (%)
Agriculture	74	49.3
Lawn & Garden	27	18
Environment	19	12.7
Families & Consumers	20	13.3
4-H Youth Development	5	3.3
Sustainable Living	12	8
Disaster Preparation & Recovery	3	2
Other/Don't Know	15	10

The media respondents were then asked how they cite people or information related to UF/IFAS when used as a source. Only 8.7% ($n = 13$) said they typically cite the brand acronym UF/IFAS alone. Thirty percent ($n = 45$) said they used the full name, University of Florida Institute of Food and Agricultural Sciences. The remaining respondents said "other" at 27.3% ($n = 41$) or don't know (2.7%, $n = 4$) (see Table 3). The majority of the responses in the "other" category said they used both the acronym and the full name together or just the University of Florida.

Table 3*How Media Respondents Cite Information from UF/IFAS (Unaided)*

	<i>n</i>	Percent (%)
UF/IFAS (Acronym)	13	8.7
University of Florida Institute of Food and Agricultural Sciences (full name)	45	30.0
Other	41	27.3
Don't Know	4	2.7

Objective Two: Determine media professionals' preferred source and information channels with respect to agricultural and natural resources related news

In order to assess this objective, media professionals were read a list of various communication channels for receiving information, and were asked their preferred method, followed by their second preferred method, and then their third preference. An overwhelming majority of the media professionals preferred to be contacted by e-mail (86%, $n = 129$), followed by phone (7.3%, $n = 11$). Fax (2%, $n = 3$), mail (2%, $n = 3$), and Web (2%, $n = 3$) as the next preferred choice; these were all of equal preference. The second preferred method of receiving information were more diverse. Fax (32%, $n = 48$) was the first of the second preferred, followed closely by Web at 27.3% ($n = 41$). See Table 4 below.

Table 4*Media Professionals' Preferred Information Channels (Aided)*

	Preferred Method		Second Choice		Third Choice	
	<i>n</i>	Percent (%)	<i>n</i>	Percent (%)	<i>n</i>	Percent (%)
E-mail	129	86	17	11.3	10	6.7
Phone	11	7.3	28	18.7	41	27.3
Fax	3	2	48	32	41	27.3
Mail	3	2	10	6.7	22	14.7
Web	3	2	41	27.3	19	12.7
Blog	1	.7	0	0	6	4
RSS	0	0	3	2	6	4
Other	0	0	2	1.3	0	0
Don't Know	0	0	1	.7	5	3.3

To further assess this objective, media professionals were asked which sources they used to obtain information for news stories or information presentation. The most used source were press releases at 85.3% ($n = 128$), followed by the AP wire at 50% ($n = 75$). 49.3% ($n = 74$) of respondents reported use of the University of Florida News and Public Affairs. Nearly 50% of the media (48%, $n = 72$) said they use another source; these other sources varied from local primary sources and community contacts to national media groups and/or wire services and commodity organizations (see Table 5).

Table 5*Sources Used by Media Respondents (Aided)*

	<i>n</i>	Percent (%)
AP	75	50.0
UPI	22	14.7
Reuters	40	26.7
RSS Feed	28	18.7
Press Release	128	85.3
UF News & Public Affairs	74	49.3
Other 1	72	48.0
Other 2	15	10.0
Don't Know	1	.7

Note. Respondents were read a list of options; “Other 2” was only recorded after a respondent gave a response in “Other 1”; *n*=number of respondents in each category.

Objective Three: Investigate local media professionals’ perceptions of UF/IFAS as an information source

To assess this objective, respondents were asked a series of questions about information provided by UF/IFAS. Respondents who had used UF/IFAS information in the past indicated they view the information provided by UF/IFAS as credible, useful to their work, and newsworthy for their audience, with credible receiving the highest rating (see Table 6).

Table 6*Media’s Opinions of Information Provided by UF/IFAS*

	<i>n</i>	Mean	SD
Credible	110	3.55	.49
Useful	116	3.22	.63
Newsworthy	112	3.14	.58

Note. 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree; *n*=number of respondents for each item, only the participants who had used UF/IFAS information in the past answered this series of questions (*n* = 116).

Media respondents were then read a list of UF/IFAS program areas. Using a scale from 1 to 5 (1=“very unimportant” and 5=“very important”), respondents were asked how important the UF/IFAS program areas are to their target audience. Respondents said the most important program area to their target audience was the environment (4.15). The second most important was disaster preparation and recovery (3.90) and the least important was 4-H youth development (2.91) (see Table 7).

Table 7*Media Respondents' Importance of UF/IFAS Program Areas to Their Target Audience (Aided)*

	<i>n</i>	Mean	<i>SD</i>
Agriculture	141	3.58	1.31
Environment	141	4.15	1.08
Families & Consumers	141	3.86	1.06
Lawn & Garden	141	3.09	1.27
Sustainable Living	138	3.44	1.15
Disaster Preparation & Recovery	139	3.90	1.16
4-H Youth Development	139	2.91	1.40

Note. Scale was from 1 to 5, where 1 is “very unimportant” and 5 is “very important”; n=number of respondents for each item.

When asked how willing they would be to use UF/IFAS as a source in specific program areas, media respondents indicated they are the least likely to use UF/IFAS as a source for disaster preparation and recovery. The media respondents were most likely to use UF/IFAS as a source for agriculture and natural resources programs (see Table 8).

Table 8*Media Respondents' Willingness to use UF/IFAS as a Source on Specific Program Areas (Unaided)*

	<i>n</i>	Mean	<i>SD</i>
Agriculture & Natural Resources	139	3.93	1.344
Families & Consumers	139	3.04	1.356
Disaster Preparation & Recovery	137	2.71	1.456
Sustainable Living	134	3.07	1.358

Note. Scale was from 1 to 5, where 1 is “not at all likely” and 5 is “very likely”; n=number of respondents for each item.

In order to further assess media professionals perceptions of UF/IFAS' image and reputation, respondents who were familiar with UF/IFAS were asked to list three words that best describe UF/IFAS. In accordance with Glaser's constant comparative method, categories were created and grouped according to themes based on responses (Glaser, 1965). Seventy-three media representatives provided at least one word or phrase. All responses were positive in nature. The largest number of responses fell into the category of positive image responses. Common responses were “consumer friendly,” “informative,” and “agriculture.” These responses are analyzed in Table 9 on the next page.

Table 9*Media Responses When Asked for Three Words that Best Describe UF/IFAS*

Response Category	Examples of Answers	No. of Responses in Category
Positive Image Responses	informative, competent, knowledgeable, professional, respected, accurate, facility, attentive, leadership, leading institute, dedicated, classic, cutting-edge, connected, dynamic, convenient, expert, enlightened	85
Education Responses	education, educational, academic, dedication to education, authoritative	20
Research Responses	research, research institute, experimental, researched, scientific	20
Positive Need Responses	resource, useful, important, helpful, necessary	17
Agriculture & Food Responses	agriculture, food, citrus, O.J., agricultural	12
Positive Emotive Responses	excellent, great, consumer friendly, personable, good people, good, very good, self promoting in the best sense	10
Community & Service Responses	community oriented, public service, local, grass roots, public interest, helping the community with ag issues	9
Outreach Responses	outreach	4
Communication Responses	media savvy, media, spread message well	4
Negative Monetary Responses	under funded, worried about funding, fund needing	3
Lawn & Garden	plants, garden, Master Gardener	3
Extension Responses	extension	2

Conclusions and Discussion

The results of this study indicate that, as a land grant institution with a focus on branding its identity, UF/IFAS has a strong image and reputation among those media professionals who are aware of it. However, overall awareness of the institution on an unaided basis among media professionals is low, despite efforts to develop a brand name identity through marketing alone. On the other hand, respondents who were familiar with UF/IFAS did perceive information from UF/IFAS as credible, useable, and trustworthy, which indicates these respondents perceived UF/IFAS as having a positive reputation. In comparison to findings from the study conducted with producers and community

leaders (Chodil et al., 2008), media respondents were less informed about research, education, and public service activities at UF/IFAS than producer and leader stakeholder groups.

The media professionals surveyed in this study perceived IFAS to be focused on agriculture; yet, the respondents indicated other program areas and information topics that UF/IFAS also covers are seen as more important to their audience. This finding corroborates the previous study with producer and leader stakeholder groups (Chodil et al., 2008). Because effective media relations involves knowing and anticipating the needs of the media (Schenkler & Herrling, 2003), UF/IFAS should place more emphasis on targeting key messages to media that coincide with the importance of subject areas in media professionals' target audiences.

Despite a recent increase in tropical storm activity and disaster preparation activities by UF/IFAS, media respondents indicated they are the least likely to use UF/IFAS as a source for disaster preparation and recovery information. This indicates a potential disconnect between what the media thinks UF/IFAS can provide in the way of information and services and what it actually does provide.

The majority of media respondents indicated they would prefer to be contacted by e-mail with news-related information or press releases. The top ranking second preferred method of receiving information was fax, followed closely by Web. Previous research has shown that although the Web has "irreversibly taken a place in the media relations mix used by public relations practitioners" (Hachigian & Hallahan, 2003, p. 59), media professionals prefer more direct methods of receiving information such as e-mail or fax. Because the preferred information channels of the media professionals surveyed were primarily one-way communication devices, UF/IFAS needs to find a new way of shaping more two-way communications efforts with media professionals. Two-way and symmetrical communication models are ideal for communication between land grant institutions and media professionals because of the ever-changing, complex environment in which the land grant exists (Grunig, 1992).

The qualitative open-ended response answers offer a deeper understanding of the way media professionals view UF/IFAS. Media professionals' responses indicated that their perceptions of UF/IFAS' image and reputation are positive, but not strongly valenced. Common responses among the media were "consumer friendly," "informative," and "agriculture." The traditional mission of the land grant includes being responsive to the needs of the state; however, extension, which is traditionally the outreach portion of the land grant's mission, was barely mentioned. In fact, "outreach" and "communication" themes were among those themes with the lowest number of responses. The Results of this study are of limited generalizability, based on the population of state and local media professionals from which the sampling frame was drawn and the application context of a single land grant institution as the focus of the study. However, the findings do suggest limited transferability and some potential future directions for research in this area with other land grants in other states.

Implications

Overall, results of this study provided support for the argument that land grants, even those engaged in branding and marketing efforts, can stand to gain from leveraging the impact of public relations. Strategically developing strong, positive relationships with the media can build the reputation of the land grant as a credible and trustworthy source of news and information with nontraditional and nonagriculturally based publics. In this study, media professionals saw the land grant as primarily a source for traditional agricultural news and information, and were less likely to be aware of other

programs areas on which UF/IFAS focuses, including the environment, which respondents rated as being most relevant to their audiences. Developing strategic two-way communications approaches that target state and local media can enhance and potentially extend the reputation of the land grant as serving the interests of all citizens. This “PR problem” represents an opportunity for land grants like UF/IFAS to embrace more of a two-way symmetrical PR model so as to better attune communications about what the land grant does to the needs and interests of the news media’s audiences which it intends to serve.

Recommendations

Recommendations based on the results of this study include recommendations for both theory and practice. From a practitioner standpoint, results of this study suggest the merit of agricultural communicators’ developing a two-way communication strategy with media professionals. This strategy should include research to determine the key messages most likely to influence media and their target audiences (Grunig L. A., 1997). Land grant institutions should focus on communicating the programs/topic areas that are of the most importance to key audiences – not what we do, but what has value for our stakeholder audiences, especially those not in traditional production agriculture.

Additionally, land grant institutions should employ the most cost effective communication technologies (examples include Web, search engine optimization, customer relationship marketing) to increase exposure and build impressions with media professionals. This is especially relevant because this and previous research indicates that these communication technologies are the preferred communication channels for media (Irani et al., 2006).

To develop a body of knowledge on media relations at land grant institutions, other land grant institutions should consider conducting similar research. This body of knowledge will open the door for land grant institutions to continue building positive relationships with the media. The focus of these relationships should be on building trust (Fill, 2002) by providing accurate information in a responsive, timely, reliable, and consistent manner (Desiere & Bey-Ling, 2007). Through continued research and media relations focused communication, land grant institutions’ potential “PR problem” can evolve into an admired public relations strategy.

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Keywords

University image, public relations, university reputation, higher education, media professionals, media relations

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