

Why Websites Work: An Examination of Interdisciplinary Agricultural Center Websites

In the 1970s, the term agricultural literacy first appeared and referred to the non-farming public's knowledge of agriculture (Mercier, 2015). A person who is agriculturally literate is someone who "would understand the food and fiber system and this would include its history and its current economic, social and environmental significance to all Americans" (National Research Council, 1988, p. 8). When a society lacks agricultural knowledge and science engagement serious implications occur, such as uninformed voting on policies that will guide the future of the agricultural industry (Duncan & Broyles, 2006; Miller, 2004; Olper & Swinnen, 2013).

Many issues related to agriculture, such as the use of biotechnology, are impacting the decisions of all citizens. As the agricultural industry has become more aware of citizens' concerns and opinions, agricultural communication has given the industry opportunity to address those concerns and opinions (Bardes & Oldendick, 2017). Agricultural communicators have the opportunity to influence the future of the agricultural industry and the perception the public has of the agricultural industry (Telg & Irani, 2012). Given the importance of their messages, agricultural communicators have adjusted the message content and the way they deliver information to audiences based on the opinions and perceptions of the public and consumers (Irani & Doerfert, 2013; Telg & Irani, 2012).

Messages developed by agricultural communicators are sometimes related to science or agricultural issues. Complex issues in many different industries are best examined through an interdisciplinary approach (Corbett et al., 2013). To examine complex agricultural issues, such as citrus greening or genetic modification, universities and research institutions promote collaboration among interdisciplinary faculty through initiatives. Various faculty and researchers from diverse disciplines have united to research issues from distinctive perspectives, exercising different research methods and designs (Corbett et al., 2013). Despite the abundance of interdisciplinary centers at American universities, centers engaging with necessary audiences, such as industry stakeholders, citizens, and university administration, has lacked popularity (Bergmann & Jahn, 2008). This lack of communication is often attributed to the complexity of the message interdisciplinary centers have to communicate (Bergmann & Jahn, 2008). Interdisciplinary faculty may want to communicate with a purpose to educate various audiences or influence decisions, encourage understanding and appreciation of science among citizens; thus, improve the overall well-being of society (Clark et al., 2011).

Interdisciplinary centers may choose from various methods to communicate with the public and educate citizens on issues studied by the center. One popular communication method among interdisciplinary centers and similar institutions is the use of online communication, such as websites. Eighty-eight percent of American adults use the Internet, either through the use of mobile devices or home broadband (Pew Research Center, 2017). Individuals with access to the Internet can learn about any topic related to a science almost immediately by searching the topic online (Brossard & Scheufele, 2013). Similarly, 67 percent of American adults access news and topical information through the use of social media (Shearer & Gottfried, 2017). As communicators of science and agriculture capitalize on adult communication preferences of web communication, the content of websites owned by research institutions, such as interdisciplinary agricultural centers, should be analyzed. Given society's lack of agricultural literacy and the popularity of agricultural science communication via the Internet, the purpose of this study was to examine the content of interdisciplinary agricultural center's websites.

Review of Literature

The way in which scientists communicate is changing as the Web develops (Warden, 2010). To increase the amount of agricultural information the public receives, as well as increase the awareness surrounding agricultural issues, many agricultural professionals have been turning to the Internet (Goodwin, Chiarelli, & Irani, 2011). Web 2.0 has allowed agricultural professionals to advocate for the industry while connecting with the public. The Internet has the potential to reach a large consumer audience, as 85% of all American adults are online (Perrin, 2015). Additionally, 91% of adults on the Internet use search engines to find information (Purcell, Brenner, & Rainie, 2012). The Internet provides many outlets for the agricultural industry to communicate to the public about agricultural issues.

In addition to using traditional methods of online media, like web pages on the Internet, social media has also become a popular way to learn about agricultural sciences (Cramer, 2013). As a result of the boost in web- communities, people use social media platforms as social devices to communicate and to facilitate communication (Cramer, 2013). The use of social media (SM) and social networking sites has speedily increased, and nearly 65% of American adults use social networking sites (Perrin, 2015). While young adults are the most popular group to utilize social media, the number of social media users, aged 65 and older, has tripled since 2010.

With such a dramatic increase in usage, several studies investigated the primary purpose of utilizing social media. In a study conducted by Texas A&M University, select participants were questioned to determine their primary purpose for using certain social media platforms, including Facebook, Instagram, Snapchat, and Twitter (Sorrells, 2017). Four options were given as the primary purposes of social media: social, information, shopping, entertainment. In the category of utilizing social media to seek information, Facebook was ranked as the first social media site a participant in the study would navigate to, in order to seek information. This was followed by Twitter, Instagram, and finally Snapchat.

Similarly, agricultural researchers in Nigeria were asked their purpose for maintaining social networking sites (Alabi, Onifade, & Sokoya, 2013). While the researchers ranked “connecting with colleagues” as the number one purpose, “sharing knowledge with others” was the second reason reported to utilize social media. In this study, it was also stated that social media serves as a way for researchers to pull “knowledge and expertise together...establish their reputation as experts or consultants” and “communicate agricultural research promptly on social networking sites” (Alabi, Onifade, & Sokoya, 2013, p. 9).

While there are a variety of ways to communicate about science, developing the appropriate communication strategy first begins with a clear mission. A mission statement is defined as a statement of the organization’s purpose and is rarely changed (Business Dictionary, n.d.). The Harvard Business Review offers four basic steps for building strategic communication capability, with the first being developing a clear mission (Everse, 2012). Once a mission is derived, a strategy can then be developed to help define the logic of how to reach the goal. Studies have evaluated this concept and assessed effective communication strategies based on company mission. In January of 2005, 400 non-profit organizations were coded on variables concerning their organizational mission in comparison to the communication strategy implemented on their online webpage (Waters, 2007). A Chi-square analysis found that top-tier nonprofits included annual reports, organizational goals, and their mission statement as part of their website content to induce a feeling of transparency. Second-tier non-profits implemented a sales approach by using e-commerce to process online donations.

Conceptual Framework

The Excellence Theory (Ehling, White, & Grunig, 1992) and theories of action, namely Espoused Theory versus Theory-in-Use (Argyris & Schön, 1974), served as the primary models for the conceptual framework of this study. These theories combined explain how organizations effectively communicate important components of excellent communication while aligning what they communicate with their adopted missions.

In 1984, Excellence Theory was produced through a study conducted by the International Association of Business Communicators (Grunig, Grunig & Dozier, 2006). During the project, the goal was to evaluate public relations practices that were being used and identify which ones were successful. The Excellence Study examined over 300 organizations in three countries, including the United States, using a series of surveys and follow-up interviews (2008). Excellence Theory suggests communication is valuable to an organization since communication leads to strategic relationships with the public (Ehling et al., 1992; Grunig & Grunig, 2008). As part of the Excellence Study, Grunig et al. (2006) found that two-way symmetrical communication has been a part of successful public relations practices. As a result of the study, Excellence Theory has become a model for successfully implementing public relations campaigns (Grunig et al., 2006).

The Excellence Study, which ultimately led to the creation of Excellence Theory, combines the elements of organizational effectiveness and strategic planning. Time is an important component of organizational effectiveness and strategic planning (Fielding, 2006). As people come from diverse backgrounds, they will view time differently (Fielding, 2006). Many audiences in the Western world see time as a valuable entity and time is often a competing value in organizations (Fielding, 2006; Grunig et al., 2006). Strategic constituencies approach and systems approach are also important components of effective communication from organizations (Grunig et al., 2006). These approaches stress the importance in use of resources and fulfilling the needs of your stakeholders (Grunig et al., 2006).

Argyris and Schön (1974) studied the conscious and unconscious reasoning processes in Espoused Theory versus Theory-in-Use. Espoused Theory is summarized as the worldview and basis for what people believe they base their actions on. Espoused Theory claims that for people's actions, there is a belief that motivates these actions. Theory-in-Use, on the other hand, is summarized as the beliefs communicated to the world based on a person's actions. Theory-in-Use argues that a person's inner beliefs and motivations can be judged and determined according to the person's actions.

In a study, Kerr (2010) sought to investigate the relationships between conceptions and practice of information literacy in academic libraries using Espoused Theory and Theory-in-Use (Argyris & Schön, 1974) as a framework. The Espoused Theory for information literacy and learning were examined in a range of policy documents, including mission and goal statements, for 11 academic libraries and their parent universities. Theory-in-Use was simultaneously assessed by analyzing the information literacy practices utilized by the libraries in their instruction initiatives, specifically practiced in their online tutorials. Semi-structured interviews with library practitioners were also conducted to accompany this data. Using a constant comparative analysis, Kerr (2010) found that information literacy education in the selected academic libraries is multi-dimensional, complex, and contradictory. Among the findings, the analysis reveals major incongruence between the espoused theories of information literacy and theories-in-use indicated by the significant gaps in academic libraries' ability to meet their goals and missions through the online tutorials (Kerr, 2010).

Purpose and Objectives

The purpose of this study was to examine the content of interdisciplinary agricultural center webpages. Learning more about these web pages will allow science and agricultural communicators to understand how science information is being communicated to the public by academic institutions.

Objective 1: Assess interdisciplinary agricultural center websites for current content through modification dates.

Objective 2: Determine the media and social media content on interdisciplinary agricultural center websites and

Objective 3: Determine the association between the mission statements and content on interdisciplinary agricultural center websites.

Methods

The content used in websites for interdisciplinary agricultural research centers was evaluated using a quantitative content analysis. A content analysis is a technique used for “analyzing and interpreting recorded material to learn about human behavior” (Ary, Jacobson, & Sorensen, 2013, p. 32). Researchers use content analyses to assign communication content to categories that are defined and determined by set rules, allowing researchers to determine if any patterns exist (Riffe, Lacy, & Fico, 2005). Websites are popular materials to study to answer research questions (Ary et al, 2013). Analyzing web content has become increasingly popular because of the significant impact the Internet has on a majority of the population (Riffe et al., 2005).

The sample of interdisciplinary agricultural research center websites was collected in the fall of 2017. The researchers analyzed websites of interdisciplinary agricultural research centers located at top American research land-grant universities located in a college of agriculture or equivalent. Top research universities were determined based on reports from the Center for Measuring University Performance. Sampling procedures identified seven universities. All universities listed all interdisciplinary centers of the main university website and were categorized per college. The list of interdisciplinary centers provided direct links to the centers’ websites except for one university. The university that was an exception did not have web pages for the interdisciplinary centers, so was therefore eliminated from the sample.

The original sample included 126 websites. Twenty-six websites were eliminated due to broken links or irrelevant content. Some links that were initially included in the sample only produced web pages with contact information for the center and was irrelevant to the study. One hundred web pages were included in the final sample.

University faculty and communicators of the University of Florida Institute of Food and Agricultural Sciences Center for Public Issues Education in Agriculture and Natural Resources were included in the sample, helped develop a coding sheet and were used to analyze the websites. The coding sheet also included categories and codes used in a previous study to analyze online agricultural awareness campaigns but was adapted for the purpose of this study (Rumble, Settle, & Irani, 2012). Coding sheets are used to guide researchers through the analysis process and follow a set coding protocol (Riffe et al. 2005). The coding protocol was defined in a coding book, which assisted researchers in making consistent decisions (Riffe et al., 2005). Qualtrics was used for coding sheets.

Researchers collected data related to general information related to the websites, including the website name, associated university, URL extension, and date of most recent content modification. Data relating to objective one was also collected, including whether or not photos or graphics were present, use of media components (i.e. video, audio, picture slideshow, PDF, PowerPoint), and use of social media links (i.e. Facebook, Twitter, YouTube, RSS, LinkedIn, Instagram, Google +). Data collected for objective two included content theme and summary of mission.

When conducting a content analysis, it is important to establish inter-coder reliability to establish validity (Riffe et al., 2005). Three coders were trained based on the coding protocol established for the study. Coders coded 10% ($n = 13$) of the original sample. To guarantee coding consistency, Cohen's Kappa was calculated on the variables analyzed to evaluate inter-coder reliability. Coders were trained to use the codebook and code sheets before analysis occurred and were then re-trained twice to ensure consistency. The codebook was also edited to be clearer about the concepts and measures. Retraining and editing of the coding protocol is a common practice when conducting a content analysis (Riffe et al., 2005). All variables had an average Kappa score of .80. Even though Krippendorff (2004) suggests reliability scores of .66 can be acceptable for some studies, .80 is typically the desired reliability score and aids in the validity of the study (Riffe et al., 2005). After the desired reliability scores were achieved, coders divided the remaining websites and completed coding within two weeks. Coders input data for individual websites using Qualtrics then transferred the data to SPSS to be analyzed. SPSS was used for descriptive statistics, cross tabulations, and Chi-squared tests.

Results

Objective 1: Assess Interdisciplinary Agricultural Center Websites for Current Information

To assess current information on the interdisciplinary agricultural center websites used in this study, the websites were coded for the last recorded time that website content was modified. Table 1 shows the coded modification dates for the websites. Of the 100 websites featured in this study, 43 did not include any modification date, while a total of 23 websites were updated in the past month. A total of 34 websites were modified more than a month ago.

Table 1

Modification Dates on Interdisciplinary Agricultural Center Websites

	Frequency	Percent
Modification Date not mentioned	43	43.0
Updated less than one week ago	15	5.0
Updated more than one week and less than one month ago	8	8.0
Updated more than one month and less than six months ago	16	16.0
Updated more than six months ago	18	18.0
Total	100	100.0

Objective 2: Determine the Media and Social Media Content Used by Interdisciplinary Agricultural Centers

To determine the media content present on interdisciplinary agricultural center websites, the presence of PDFs, picture slideshows, video, PowerPoint presentations, and audio was assessed. Table 2 lists the frequencies of media content on the websites in this study. The PDF media content theme was most frequently coded as present on 67 websites, while audio media content was least coded as present on one website.

Table 2

Frequency of Media Content on Interdisciplinary Agricultural Center Websites

	Frequency	Percent
PDF	67	67.0
Picture Slideshow	29	29.0
Video	26	26.0
PowerPoint	11	11.0
Audio	1	1.0

Table 3 displays the media content scores for websites of interdisciplinary agricultural centers. Of the 100 websites included in this study, 25 of websites were coded as lacking any media content (score = 0.00). There were 32 websites that were coded with one form of media content, and 30 websites coded with two forms of media content. No website was coded with all five variable themes of media content. Only three websites were coded with at least four of the five forms of media content.

Table 3

Media Score for Interdisciplinary Agricultural Center Websites

Media Content Score	Frequency	Percent
0.00	25	25.0
1.00	32	32.0
2.00	30	30.0
3.00	10	10.0
4.00	3	3.0
5.00	0	0.0
Total	100	100.0

To determine the social media content present on interdisciplinary agricultural center websites, the presence of Facebook, Twitter, YouTube, LinkedIn, RSS, Google+, and Instagram was assessed. Table 4 lists the frequencies of social media content on the websites in this study. The Facebook social media content theme was most frequently coded as present on 39 websites, while Instagram social media content was least coded as present on one website.

Table 4

Frequency of Social Media Content on Interdisciplinary Agricultural Center Websites

Social Media Content	Frequency	Percent
Facebook	39	39
Twitter	33	33
YouTube	19	19
LinkedIn	12	12
RSS	10	10
Google+	4	4
Instagram	1	1

Table 5 displays the social media content scores for websites of interdisciplinary agricultural centers. Out of the 100 websites, 57 were coded as lacking any display of social media content (score = 0.00). Only three websites were coded with as many as five themes of social media content. No website was coded with all seven variable themes of social media content.

Table 5

Social Media Score for Interdisciplinary Agricultural Center Websites

Social Media Content Score	Frequency	Percent
0.00	57	57.0
1.00	8	8.0
2.00	9	9.0
3.00	15	15.0
4.00	8	8.0
5.00	3	3.0
6.00	0	0.0
7.00	0	0.0
Total	100	100.0

Objective 3: Determine the Relationship Between a Center’s Mission and the Content Present of Interdisciplinary Agricultural Center Websites

A total of 70 interdisciplinary agricultural centers included a mission statement somewhere on their websites. Of the 70 websites that included a mission statement, 31 websites included their mission statements on the homepage, while 39 websites listed their mission statements on a subpage. There were 55 mission statements that were coded by the researchers as having in summary the mission to research, 46 mission statements coded as having in summary the mission to educate, and 34 mission statements coded as having in summary the mission to communicate. Note that some mission statements were coded with having more than one summary of mission.

Cross-tabulations were used to calculate the frequencies of the coded content themes and the center website’s coded mission on interdisciplinary agricultural center websites. Table 6 shows the commonality between the presence of research content and their mission to conduct research. Of the 100 websites in this study, 50 displayed research content while also stating a mission to conduct research. Five websites stated a mission to conduct research without displaying research content.

Table 6

Mission to Research and Research Content Theme on Interdisciplinary Agricultural Center Websites

		<u>Summary of Mission</u>		Total
		To Research	Not Research	
Content Theme	Research	50	4	54
	No Research	5	11	16
Total		55	15	70

In Table 7 below, the commonality is displayed between the presence of educational content and interdisciplinary agricultural center websites’ mission to educate. Of the 100 websites in this study, 42 displayed educational content while also stating a mission to educate. Four websites stated a mission to educate without displaying educational content. There were twelve centers that did not state a mission to educate but included educational content on their websites.

Table 7

Mission to Educate and Educational Content Theme on Interdisciplinary Agricultural Center Websites

		<u>Summary of Mission</u>		Total
		To Educate	Not Educate	
Content Theme	Education	42	12	54
	No Education	4	12	16
Total		46	24	70

Table 8 displays the commonality between the presence of outreach content and interdisciplinary agricultural center websites' mission to communicate. Of the 100 websites in this study, 29 displayed outreach content while also stating a mission to communicate. Five websites stated a mission to communicate without displaying outreach content. There were 21 centers that do not have a mission to communicate but included outreach content on their websites.

Table 8

Mission to Communicate and Communication Content Theme on Interdisciplinary Agricultural Center Websites

		<u>Summary of Mission</u>		Total
		To Communicate	Not Communicate	
Content Theme	Outreach	29	21	50
	No Outreach	5	15	20
Total		34	36	70

To evaluate the statistical differences in the association between the coded content themes and the center website's coded mission, a Chi-square table test was used. The results are displayed in Table 9 below. The test showed that the mission variables to research, educate, and communicate were all significant in the determination of the websites' content. Cramer's value of .628 was used for the Research variable as it did not meet the assumption of the expected counts. The Phi-values for the Educate variable (.467) and Communicate variable (.298) showed significant relationships between the content and mission variables.

Table 9

Chi-Squared Table for Mission and Content

	Chi-Square	P-value	Measures
Research	27.586	>.001	Cramer's V .628
Educate	15.260	>.001	Phi .467
Communicate	6.228	.013	Phi .298

Conclusions

Interdisciplinary agricultural centers have the opportunity to communicate to a wide range of audience members through the use of websites and online communication. With 85% of American adults having an online presence (Perrin, 2015) and 91% of adults using the Internet to search and find information (Purcell, Brenner, & Rainie, 2012), websites and online communication serve as an optimal method for interdisciplinary centers to reach more people.

The findings of this study show that almost half (43%) of the selected interdisciplinary agricultural centers do not communicate when their website information has been modified or updated. There were 23 centers that have updated website information within the last month and 34 centers that have modified their sites at least one month ago. These findings may bring into

question the trustworthiness of the information dispensed by interdisciplinary agricultural centers as timeliness factors into audience trust (Fielding, 2006). In accordance with Excellence theory (Ehling, White, & Grunig, 1992), interdisciplinary agricultural centers have the responsibility to utilize up-to-date website communication as a strategy to develop trust with those who view their center websites.

The media content utilized on interdisciplinary agricultural center websites was determined in this study as well. PDFs were most prominently coded on center websites (67%), followed by picture slideshows (29%), video (26%), PowerPoint (11%), and audio (1%). A fourth of the websites were coded as lacking media content. A total of 62 websites were coded with just one or two forms of media content. No website was coded with all five variable themes of media content. Only three websites were coded with at least four of the five forms of media content. Interdisciplinary agricultural centers have the responsibility to use their resources in a way that will meet the needs of their stakeholders through their choice of communication content (Grunig, Grunig, & Dozier, 2006).

As for the social media content identified in this study, Facebook is the most common social media content found on interdisciplinary agricultural center websites (39%), followed by Twitter (33%), YouTube (19%), LinkedIn (12%), RSS (10%), Google+ (4%), and Instagram (1%). This aligns with the order of social media popularity determined by Sorrells (2017). More than half (57%) of the centers lack any social media content on their websites, while 32% of the centers have one, two, or three forms of social media on their websites. Social media networking sites can serve as a prime way for centers to develop connections with an external audience and communicate their research (Alabi, Onifade, & Sokoya, 2013). Yet, a majority of the centers in this study are not utilizing social media networking as an organizational strategy to connect with the public.

This study also explored the relationship between the stated missions of the selected interdisciplinary agricultural centers and their website content. Cross-tabulations showed the centers' choice to research as part of their stated mission and the presence of research content on their websites. Half of the centers (50%) profess a mission to research while also presenting research on their websites. Only five centers stated a mission to research but lacked research website content. Similarly, 42 centers have the mission to educate and also include educational content on their websites, while 4 centers state a mission to educate but lack educational content on their websites. There were 29 centers that include a mission to communicate in their mission statements while also including outreach content on their websites. Five centers have the mission to communicate but lack outreach website content, yet 21 websites do not state a mission to communicate but still have outreach content on their websites.

The Chi-square test provided the degree of association between interdisciplinary agricultural centers' mission statements and their website content. The test showed that the mission variables to research (Cramer's value = .628), educate (Phi value = .467), and communicate (Phi value = .298) were all significant in the determination of the websites' content. The associations between centers' mission statements and the information they include on their websites show the alignment of their communication strategies with their missions. Excellence Theory (Ehling, White, & Grunig, 1992) can be used to understand these choices to align centers' missions and website content as organizational strategies for relationship development and communication of transparency (Waters, 2007). Furthermore, this alignment could be understood as a form of espoused theory matching Theory-in-Use (Argyris, & Schon, 1974). It is clear that there is a relationship between the espoused beliefs of centers, as stated in their mission statements, and the

website content used. Some of the centers were coded with mission statements that did not align with their website content. In these cases, the Espoused theories did not match the Theories-in-Use (Argyris, & Schon, 1974).

As scientists adapt their communication with the changes in the Web (Warden, 2010), it is important to also keep in mind effective communication strategies for the organizations and the centers of learning they represent. Furthermore, as agricultural scientists and communicators of agricultural science utilize the Internet to dispense information around key issues (Goodwin, Chiarelli, & Irani, 2011), it is imperative that communication choices align with any professed commitments and mission statements so as to communicate organizational honesty and transparency to the public (Waters, 2007).

Recommendations

As scientists adapt their communication with the changes in the Web (Warden, 2010), it is important to also keep in mind effective communication strategies for the organizations and the centers of learning they represent. Furthermore, as agricultural scientists and communicators of agricultural science utilize the Internet to dispense information around key issues (Goodwin, Chiarelli, & Irani, 2011), it is imperative that communication choices align with any professed commitments and mission statements so as to communicate organizational honesty and transparency to the public (Waters, 2007).

Based on the findings, it is concluded that interdisciplinary agricultural centers have the opportunity to improve online communication and the usefulness of their website content. Having an online presence is one strategy for centers to connect with public audiences, but excellence theory (Ehling, White, & Grunig, 1992) would assert that these centers could utilize better online communication practices as a means to increase organizational effectiveness. There are four primary recommendations from the findings of this study:

Website content should be modified in a timely manner. Centers can choose to communicate the modification times for the content on their websites as one way to show viewers their information is up-to-date (Fielding, 2006). Additionally, centers should communicate news and events with their constituencies quickly or in a timeframe that is most appropriate for the content they want to share (Grunig, Grunig, & Dozier, 2006).

Website media content should be diversified. There are several forms of media content that are under-utilized by interdisciplinary agricultural centers on their websites. By diversifying content based on the needs of the centers' stakeholders, centers can deliver the most useful communication for constituencies (Grunig, Grunig, & Dozier, 2006).

Social media accounts provide a unique opportunity to connect with the public. Interdisciplinary agricultural centers can utilize appropriate social networking sites to connect with other science communication organizations, disperse knowledge, communicate new research in a timely manner, and ultimately establish respect and status as experts in a particular field (Alabi, Onifade, & Sokoya, 2013). While some forms of social media are not appropriate for the communication purposes of centers, other forms can be highly effective due to their popularity (Sorrells, 2017). It is recommended to the centers that currently lack any form of social media to create at least one social networking account as an organizational communication strategy (Ehling, White, & Grunig, 1992).

Finally, it is highly recommended for interdisciplinary agricultural centers to align their website content with their mission statements. A majority of the centers in this study display a

congruence of their espoused beliefs with practice through matching their missions with content; however, there were still some centers that lacked content to match their missions. Keeping Espoused Theory that aligns with Theory-in-Use can help to build transparency and trust with public audiences (Waters, 2007).

Limitations of this study include limited centers allowed in the sample and the variables determined by the instrument. Researchers of the study also assumed the general public were the target audience of the interdisciplinary agricultural centers. Future research should determine the intended target audience of the web pages. The effectiveness and usability of the web pages should also be tested through future research. Even though this study determined if interdisciplinary agricultural centers webpages linked information about their social media, the centers' use of social media was not analyzed. Future research should analyze interdisciplinary agricultural centers' use of social media and the content and messages the centers are using on popular social media sites, such as Facebook and Twitter.

- Alabi, A. O., Onifade, F. N., & Sokoya, A. A. (2013). *Social media in agricultural research in Nigeria: A platform for connections and networking*. Retrieved from <https://www.ifla.org/past-wlic/2012/205-sokoya-en.pdf>
- Argyris, C., & Schon, D. (1974). *Theory in practice: Increasing professional effectiveness*. San Francisco: Jossey Bass.
- Aronson, E. (1968). Dissonance theory: Progress and problems. In R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcomb, M. J. Rosenberb & P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook* (pp. 5—27). Chicago: Rand McNally.
- Bardes, B. A., & Oldendick, R. W. (2017). *Public opinion: Measuring the American mind*. Lanham: Rowman & Littlefield Publishers.
- Bergmann, M., & Jahn, T. (2008). CITY:mobil: A model for integration in sustainability research. In *Handbook of Transdisciplinary Research* (pp. 89–102). Dordrecht, Bern, Switzerland: Springer.
- Brossard, D., & Scheufele, D. A. (2013). Science, new media, and the public. *Science*, 339(6115), 40–41. doi: [10.1126/science.1232329](https://doi.org/10.1126/science.1232329)
- Business Dictionary, (n.d.) *Mission Statement*. Retrieved from <http://www.businessdictionary.com/definition/mission-statement.html>
- Clark, W. C., Tomich, T. P., Van Noordwijk, M., Guston, D., Catacutan, D., Dickson, N. M., & McNie, E. (2011). Boundary work for sustainable development: Natural resource management at the Consultative Group on International Agricultural Research (CGIAR). *Proceedings of the National Academy of Sciences*, 113(17), 4615–4622. doi: [10.1073/pnas.0900231108](https://doi.org/10.1073/pnas.0900231108)
- Corbett, C. F., Costa, L. L., Balas, M. C., Burke, W. J., Feroli, E. R., & Daratha, K. B. (2013). Facilitators and challenges to conducting interdisciplinary research. *Medical Care*, 51, S23–S31. doi:[10.1097/mlr.0b013e31827dc3c9](https://doi.org/10.1097/mlr.0b013e31827dc3c9)
- Cramer, C. (2013). *Social media uses by students in an agricultural student orientation course* (Master's thesis). Oklahoma State University, Stillwater, OK. Retrieved from <https://hdl.handle.net/11244/11078>
- Dozier, D. M., & Broom, G. M. (1995). Evolution of the manager role in public relations practice. *Journal of Public Relations Research*, 7(1), 3-26. doi: [10.1207/s1532754xjpr0701_02](https://doi.org/10.1207/s1532754xjpr0701_02)

- Duncan, D. W., & Broyles, T. W. (2006). A comparison of student knowledge and perceptions toward agriculture before and after attending a governor's school for agriculture. *NACTA Journal*, 50(1), 16–21. Retrieved from <http://www.jstor.org/stable/43766889>
- Ehling, W. P., White, J., & Grunig, J. E. (1992). Public relations and marketing practices. *Excellence in public relations and communication management*, 357-394.
- Everse, G. (2012, March). Four steps to building a strategic communications capability. *Harvard Business Review*. Retrieved from <https://hbr.org/2012/03/four-steps-to-building-a-strat>
- Fielding, M. (2006). *Effective communication in organizations*. Cape Town: Juta & Co.
- Goodwin, J. N., Chiarelli, C., & Irani, T. (2011). Is perception reality? Improving agricultural messages by discovering how consumers perceive messages. *Journal of Applied Communications*, 95(3), 3. [doi:10.4148/1051-0834.1162](https://doi.org/10.4148/1051-0834.1162)
- Grunig, J. E., & Grunig, L. A. (2008). Excellence theory in public relations: Past, present, and future. *Public Relations Research*, 327-347. [doi: 10.1007/978-3-531-90918-9_22](https://doi.org/10.1007/978-3-531-90918-9_22)
- Grunig, J. E., Grunig, L. A., & Dozier, D. M. (2006). The excellence theory. *Public Relations Theory II*, 21-62. Mahwah, NJ: Lawrence Erlbaum.
- Irani, T., & Doerfert, D. L. (2013). Preparing for the next 150 years of agricultural communications. *Journal of Applied Communications*, 97(2). [doi: 10.4148/1051-0834.1109](https://doi.org/10.4148/1051-0834.1109)
- Kerr, P. A. (2010). *Conceptions and practice of information literacy in academic libraries: Espoused theories and theories-in-use* (Doctoral dissertation). Rutgers University, Brunswick, NJ. Retrieved from <https://doi.org/10.7282/T31J99TT>
- McLeod, J. M., Kosicki, G. M., & McLeod, D. M. (1994). The expanding boundaries of political communication effects. In J. Bryant & D. Zillmann (Eds.), *Media effects: Advances in theory and research* (pp. 123-162). Hillsdale, NJ: Erlbaum.
- Mercier, S. (2015). *Food and agricultural education in the United States*. Washington, DC: AGree. Retrieved from [http://www.foodandagpolicy.org/sites/default/files/AGree_Food and Ag Ed in the US.pdf](http://www.foodandagpolicy.org/sites/default/files/AGree_Food_and_Ag_Ed_in_the_US.pdf)
- Miller, J. D. (2004). Public understanding of, and attitudes toward, scientific research: What we know and what we need to know. *Public Understanding of Science*, 13(3), 273–294. [doi: 10.1177/1075547004270008](https://doi.org/10.1177/1075547004270008)
- National Research Council. (1988). *Understanding agriculture: New directions for education*. Washington, DC: National Academy.
- Nisbet, M. C., & Mooney, C. (2007). Framing science. *Science*, 316(5821), 56-56. [doi: 10.1126/science.1142030](https://doi.org/10.1126/science.1142030)
- Olper, A., & Swinnen, J. (2013). Mass media and public policy: Global evidence from agricultural policies. *The World Bank Economic Review*, 27(3) 413-436. [doi: 10.1093/wber/lht008](https://doi.org/10.1093/wber/lht008)
- Perrin, A. (2015). *Social Networking Usage: 2005-2015*. Pew Research Center. Retrieved from <http://www.pewinternet.org/2015/10/08/2015/Social-Networking-Usage-2005-2015/>
- Pew Research Center (2018). *Internet/broadband fact sheet*. Retrieved from <http://www.pewinternet.org/fact-sheet/internet-broadband/>
- Purcell, K., Brenner, J., & Rainie, L. (2012). *Search engine use 2012*. Retrieved from <https://www.issuelab.org/resources/12470/12470.pdf>
- Shearer, E., & Gottfried, J. (2017). *News use across social media platforms in 2017*. Retrieved from <http://www.journalism.org/2017/09/07/news-use-across-social-media-platforms-2017/>

- Sorrells, H. N. (2017). *Utilizing social media communication platforms as a recruitment strategy for the department of agricultural sciences at West Texas A&M University* (Masters thesis). West Texas A&M University, Canyon, TX. Retrieved from <http://hdl.handle.net/11310/126>
- Telg, R., & Irani, T. A. (2012). *Agricultural communications in action: A hands-on approach*. Clifton Park, NY: Delmar, CENGAGE Learning.
- Tewksbury, D., & Scheufele, D. A. (2007). Special issue on framing, agenda setting, & priming: Agendas for theory and research. *Journal of Communication*, 57(1), 8-8. [doi: 10.1111/j.1460-2466.2006.00337.x](https://doi.org/10.1111/j.1460-2466.2006.00337.x)
- Warden, R. (2010). The Internet and science communication: Blurring the boundaries. *Ecancermedicalscience*, 4, 203. [doi: 10.3332/2Fecancer.2010.203](https://doi.org/10.3332/2Fecancer.2010.203)
- Waters, R. D. (2007). Nonprofit organizations' use of the internet: A content analysis of communication trends on the internet sites of the philanthropy 400. *Nonprofit Management and Leadership*, 18(1), 59–76. [doi: 10.1002/nml.171](https://doi.org/10.1002/nml.171)

ABOUT THE AUTHORS:

Ashley McLeod is the public relations specialist for the Center for Public Issues Education in Agriculture and Natural Resources at the University of Florida. McLeod's research interests include agricultural communication production (video production, print media, and media relations), science communication, and social media. McLeod was a Master of Science student in the University of Florida's Department of Agricultural Education and Communication when she conducted this study.

Valerie McKee is a doctoral student in the Department of Agricultural Education and Communication at the University of Florida and is the Education and Training Specialist for Wedgworth Leadership Institute. Her research interests include problem-solving, interpersonal leadership, and agricultural leadership programming.

Savannah Woodall was an undergraduate in the Department of Agricultural Education and Communication at the University of Florida and media assistant for the Center for Public Issues Education in Agriculture and Natural Resources when she assisted with this project.

Brandon McKee was an undergraduate in the Department of Food and Resource Economics at the University of Florida and research assistant for the Center for Public Issues Education in Agriculture and Natural Resources when he assisted with this project.

Dr. Joy Rumble is an assistant professor in the Department of Agricultural Communication, Education, and Leadership at The Ohio State University. Her research interests focus on the public perceptions of food and agriculture.