

Diffusion of Social Media Among County 4-H Programs in Tennessee

Rebekah D. Bowen

University of Georgia Cooperative Extension

Carrie A. Stephens

Courtney C. Childers

Elizabeth J. Avery

Christopher T. Stripling

The University of Tennessee, Knoxville

Over the past decade, Cooperative Extension and 4-H professionals have been faced with the decision of whether to adopt new communication technologies such as social media. Research on social media and Cooperative Extension has identified risks and barriers to adoption; however, many Cooperative Extension professionals believe that social media usage could be very beneficial for Cooperative Extension and/or 4-H usage. In order to increase the body of knowledge on this subject, a quantitative study was conducted to determine the diffusion of social media among county 4-H programs in Tennessee. The study was conducted via an online questionnaire distributed to all 4-H program leaders in Tennessee, and a 49% (n = 196) response rate was obtained. Eight-four percent of county 4-H program leaders utilized social media for their county program. A majority of program leaders had a positive view of social media usage and felt that it was an efficient and effective way to communicate information. Overall, the study determined that social media is gaining widespread usage throughout rural and urban county 4-H programs in Tennessee, and that increased efforts toward training and research in this area is warranted.

Keywords: social media usage; diffusion of social media; Cooperative Extension

Since its earliest days, Cooperative Extension has been an organization that required its professionals to be competent in the field of communication. Training in the area of communication, however, has not always been readily available to Cooperative Extension professionals (Agunga, 1993). In both the Agricultural Education and Extension fields, it is becoming apparent that communication training should become an integral part of pre-service and in-service training for professionals in both of these fields. Recent research has shown that communication skills are a necessary competency for Cooperative Extension professionals from a leadership (Moore & Rudd, 2004), human resources (Scheer, Cochran, Harder & Place, 2011) and academic extension education viewpoint (Scheer et al., 2011). Communication competency was found to be important whether Cooperative Extension professionals worked with traditional or non-

traditional clientele (Borden & Harris, 1998). Due to their reliance on effective communication, Cooperative Extension and 4-H personnel have identified a need to adapt to changing communication techniques in order to ensure that communication and programming remain relevant to new generations of 4-H and Cooperative Extension clientele (Fuess & Humphreys, 2011). Today, over six million youth are involved in 4-H projects, clubs, and activities nationwide (National 4-H Council, 2010). The majority of 4-H youth, ages 9 to 19, are a part of the generation known as the *Millennial Generation* (Howe & Strauss, 2000; Lindbeck & Fodrey, 2010). Typically considered to be born between 1982 and 2000, members of the millennial generation are tech-savvy, community-minded individuals who prefer to communicate via text messaging, blogging, Facebook, and other more social types of media (Howe & Strauss, 2000; Lindbeck & Fodrey,

2010). According to a recent study, over 70% of 18 to 29 year olds use social media and 72% of American teens use social networking sites, such as Facebook, Myspace, or LinkedIn (Lenhart, Purcell, Smith & Zickuhr, 2010). Because of the widespread usage of social media, Agricultural Education and Extension professionals have begun to research how social media can be effectively utilized to support existing methods of communication and information delivery (Coates, 2004; Doerfert, Graber, Myers & Irlbeck, 2012; Fuess & Humphreys, 2011; Kinsey, 2010; Rhoades, Thomas & Davis, 2009; Murphrey, Rutherford, Doerfert, Edgar and Edgar, 2012; Seger, 2011). In 2011, researchers in two Midwestern states conducted research studies on utilizing social media as a communication method for Cooperative Extension professionals (Hill, Bailey, Arnold & Myers, 2012; Russell, Reynolds, Washburn & Chumbley, 2012). However, at the time this research study was proposed, there was no empirical evidence found that investigated the adoption and diffusion of social media on an organizational or individual level among county 4-H programs. To that end, this study sought to describe how county 4-H program leaders are utilizing social media to communicate with their clientele, the types of social media being utilized, and the program leaders' perceptions of current and future usage of social media. This study will contribute to Research Priority Two (new technology, practices, and products adoption decisions) of the American Associations for Agricultural Education's *National Research Agenda*, which seeks to "achieve positive outcomes in current and future agriculture-related diffusion efforts" (Doerfert, 2011, p. 8).

Theoretical Framework

Roger's (1995) theory of diffusion of innovations was used to frame this study, and describes diffusion as a process by which innovations or new technologies are communicated and distributed through various channels over time between members of a society or the social system (Rogers & Shoemaker, 1971; Rogers, 1995). According to the theory of diffusion of innovations, there are

five key characteristics that moderate technology adoption: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability (Rogers & Shoemaker, 1971; Rogers, 1995). *Relative advantage* describes the degree to which adopting the new technology would be more beneficial than continuing to utilize current technologies (Rogers, 1995). *Compatibility* addresses whether or not the new technology works well with currently established technologies and practice (Rogers, 1995). *Complexity* is the difficulty of learning how to utilize a new technology or adopt a new idea (Rogers, 1995). *Trialability* represents the ability of new users to experiment with the idea or technology and what investment of time and/or money is involved with experimentation (Rogers, 1995). *Observability* is the ability to see visible results from utilizing the new technology (Rogers & Shoemaker, 1971; Rogers, 1995). Together these five established characteristics help determine whether a new innovation will be highly successful or face failure (Katz, Levine & Hamilton, 1963). While Rogers' theory was established in the mid-1900s, research has shown that Rogers' predictions for adoption and diffusion still hold true for modern technological advances such as social media (Liebrenz-Himes, Dyer & Shamma, 2009). Rogers' theory posits that an individual's decision to adopt or reject a new innovation follows a model known as the innovation-decision process. The innovation-decision process is "the process through which an individual (or other decision making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (Rogers, 1995, p.20).

While the acceptance or rejection of innovations by individuals can be described by Rogers' (1995) innovation-decision process, the diffusion of innovations in organizations has been shown to follow a different pattern due to factors that cannot be controlled on an individual level (Rogers, 1995; Frambach & Schillewaert, 2002). Furthermore, the adoption of innovations should contribute to the effectiveness of the organization. Rogers' posited, however, that organizational factors such as system openness

and formalization could have an effect on the organizational innovation process. System openness was described as “the degree to which members of a system are linked to others of a system” (Rogers, 1995, p. 377), and formalization was defined as “the degree to which an organization emphasizes following rules and procedures in the role performance of its members” (Rogers, 1995, p. 377). While a high degree of system openness was found to have a positive effect on organizational innovation, formalization was found to have a negative effect on the innovation process (Rogers, 1995). The profit or non-profit structure of an organization has also been shown to have some impact on the organizational innovation process (Hull & Lio, 2005; Jaskyte & Dressler, 2005). In its most basic form, however, Rogers (1995) describes the innovation process in an organization as having five key stages: agenda-setting, matching, redefining/restructuring, clarifying and routinizing. Research of innovation adoption within an organization indicated that some elements which aid in the first two stages actually have negative effects on the final three stages; therefore, a dual-core model was established that represents the different processes as they occur before and after the decision to adopt (Rogers, 1995). The *initiation* phase of the process consists of gathering information, conceptualizing needs and potential uses, and planning for how the innovation will be utilized once adopted (Rogers, 1995). Once the decision to adopt an innovation has been made, the *implementation* phase takes place. The implementation phase includes all of the steps necessary to fully integrate the innovation as a natural part of the organization’s daily activities (Rogers, 1995).

Purpose and Objectives

The purpose of this study is to describe how county 4-H program leaders in Tennessee utilize social media and to determine perceptions of 4-H program leaders toward current and future usage of social media communication methods (i.e. Twitter, Facebook, or blogging). The specific objectives of this study include:

1. Describe which types of social media sites are utilized by county 4-H programs.
2. Describe how county 4-H program leaders currently utilize social media to interact with 4-H members, volunteers and other adults in their county.
3. Determine perspectives towards current and future social media usage for 4-H as shown by the county 4-H program leaders.

Methods and Procedures

For this descriptive study, a cross-sectional survey design (Ary, Jacobs & Sorenson, 2010) was utilized to investigate the perceptions and usage of social media by county 4-H program leaders in Tennessee. The target population of the study was county 4-H personnel in Tennessee, which included County Program Assistants, County Extension Agents and County Extension Directors. Tennessee 4-H staff assisted the researchers with identifying the members of the target population and provided access by granting permission for the researchers to utilize three regional Cooperative Extension 4-H listservs. The listservs included a total of 207 4-H personnel, 11 of whom were excluded from participation because of their previous inclusion in the pilot study.

The questionnaire used in this study was a researcher-developed questionnaire that was based on works of several authors (Cavazza, 2011; Kattan & Adams, 1994; Lenhart, Purcell, Smith & Zickuhr, 2010), and contained survey questions and a scale that was either used or modified from the previously mentioned studies. The questionnaire included concepts and ideas from the Pew Internet and American Life Project’s study on social media and internet usage by teens and young adults (Lenhart, Purcell, Smith & Zickuhr, 2010); social media categories similar to the Social Media Landscape developed by Fred Cavazza (Cavazza, 2011); determination of population size based on the Rural Urban Commuting Area Classification System (as cited in Avery, Lariscy, Amador, Ickowitz, Primm & Taylor, 2010); and a modification of the Perceived Usefulness Scale (Kattan & Adams, 1994).

Furthermore, one section in the questionnaire sought to determine how social media was being utilized by personnel in extension. In that particular section, questions related to social media use were divided into three categories: (a) direct communication, (b) in-direct communication, and (c) sharing and mass communication. Direct communication options included the use of Facebook messaging, Twitter direct message, Twitter @ reply, or other method to specifically contact an individual or a targeted group of individuals. In-direct communication choices included posting to a 4-H interest group, sharing information via Facebook or Twitter status updates, or other methods of providing targeted information to a large group of fans or followers. Finally, the sharing and mass communication category choices were creating a blog, Facebook page, YouTube account, Twitter account or other profile with the general intention of sharing information that would be publicly accessible but had no direct target audience.

Face and content validity for the questionnaire were established through review by an expert panel. The expert panel consisted of three members of the Tennessee 4-H staff, one National 4-H staff member, four university agricultural education and extension faculty members, and one social media professional. Feedback from the panel members was received individually and combined to identify changes needed to clarify questions and constructs. Panel members indicated that the questionnaire was very lengthy and that some questions seemed repetitive. Questions were combined and streamlined so that the questionnaire was shorter and concepts were clearer.

A pilot study was then conducted with 11 county 4-H program leaders who represented each of the three Cooperative Extension regions in Tennessee. The pilot study included males ($n = 4$) and females ($n = 7$) ranging in age from 27 to 63 years old. Participants were selected from a list provided by the Tennessee 4-H office. A purposeful sample was selected to ensure that the pilot study sample would be representative of each Cooperative Extension region. Age was unknown at the time of the pilot study and was not used to select pilot study participants. Pilot study participants were contacted via telephone

and asked about their willingness to participate in the pilot study. Each of the 11 participants who were contacted agreed to participate and they were sent the questionnaire via email with an explanation of the purpose of the study. Participants were asked to complete the questionnaire and to contact the researchers with any additional feedback about the design of the questionnaire. Reliability of the usefulness of social media scale included in the questionnaire was assessed using Cronbach's alpha coefficient, and the alpha coefficient was found to be .87. This is acceptable according to Nunnally (1978), who suggested .7 as a minimum threshold for an acceptable alpha coefficient. For the survey portion of the questionnaire, no reliability measures were established due to the independent design of the items. An online questionnaire was chosen as the method of delivery based on the resources available to conduct this study, as well as the ability to gain an increased amount of data from a larger population (Ary et al., 2010). Through the usage of the three Cooperative Extension listserves, a total population of 207 county 4-H program leaders, which included program assistants, county agents and county extension coordinators, were sent the questionnaire via email. Eleven recipients were excluded from the number of potential respondents due to their earlier participation in the pilot study. The questionnaires were distributed with a cover email indicating: a) the purpose of the study, b) instructions for completing the questionnaire, c) clear indication of the University of Tennessee sponsorship, and d) information about incentives. A \$25 gift card was awarded to five randomly selected participants.

After three initial contacts by email, the response rate was 41.3%. The counties that were not represented after the three initial email contacts were contacted via telephone. Researchers asked to speak with the primary 4-H contact in that county and personally encouraged the 4-H leader to complete the questionnaire. These program leaders were individually emailed an additional copy of the questionnaire to ensure that they had easy access to complete the questionnaire and return it in a timely manner. At the end of a three week period, a total of 15 leaders had completed the

questionnaire in response to personal outreach via telephone. Overall, a total of 96 responses were received out of a possible 196 for a final response rate of 49%. A total of 81% ($n = 95$) of county 4-H programs in Tennessee were represented in the study, with some counties having representation by more than one program leader. Non-response error was addressed by comparing early and late respondents, as described by Ary et al. (2010). Survey results from each unique survey mail-out were compared using SPSS statistical analysis and no significant differences were found. Therefore, the respondents were determined to represent an unbiased sample of the population. Descriptive statistics including means, frequencies and standard deviations were calculated to summarize the data as appropriate.

Table 1

County 4-H Program Leaders' Frequency of Social Media Usage by Social Media Service

Variable	<i>n</i>	At least weekly		Every few weeks		Less often		Never	
		<i>f</i>	%	<i>F</i>	%	<i>f</i>	%	<i>f</i>	%
Blogging (Blogger, Wordpress, Posterous)	77	3	3.9	3	3.9	4	5.2	67	87.0
Commerce (Groupon, LivingSocial, Swipely)	77	4	5.2	2	2.6	4	5.2	67	87.0
Micro-Blogging (Twitter)	77	2	2.6	3	3.9	9	11.7	63	81.8
Video Chat (Skype)	75	3	4.0	1	1.3	12	16.0	59	78.7
Photo Sharing (Flickr, Pinterest)	76	8	10.5	10	13.2	9	11.8	49	64.5
Text Chat (Yahoo!, Google Talk, Facebook Chat)	76	17	22.4	9	11.8	6	7.9	44	57.9
Video Sharing (YouTube, SocialCam)	77	3	3.9	8	10.4	29	37.7	37	48.1
Social Networking (Facebook, Myspace, LinkedIn, Google+)	78	58	74.4	10	12.8	5	6.4	5	6.4

Note. Categories in which 90% or more of respondents indicated they had never utilized the social media service or technology were not included in the table. These categories were social gaming, virtual worlds, dashboards, analytics, discussion, and check-in.

Results

Objective 1: Describe which types of social media sites are utilized by county 4-H programs

As shown in Table 1, several of the social media categories exhibited very limited usage, and four categories showed usage greater than 5% on at least a weekly basis. These included social networking, text chat, commerce, and photo sharing. Additionally, 74.4% ($n = 79$) reported using social networking sites, such as Facebook. Text chat was the category with the second highest frequency of weekly usage (22.8%, $n = 79$).

Objective 2: Describe how county 4-H program leaders currently utilize social media to interact with 4-H members, volunteers and other adults in their county

In order to determine if technology accessibility was an issue, participants were asked to select all devices in which they had access for use with social media services (see Table 2). A majority of respondents had access to a personal computer of some type, whether it was a desktop PC, laptop or netbook. In

addition, 50% had access to social media through a Smartphone with internet. Respondents were also asked to report their approximate total usage of social media for personal and professional purposes. Over 60% reported a total social media usage of less than four hours per week. In addition, 51% felt that the usage of social media for 4-H was *very important to extremely important*. An additional 45.7% felt that social media was *slightly important to moderately important*.

Table 2

General Usage of Social Media by County 4-H Program Leaders in Tennessee

Variable	<i>n</i>	<i>f</i>	%
Access to Devices*	96	66	68.8
Desktop PC		82	85.4
Laptop computer\Netbook		33	34.4
iPad or tablet computer		30	31.3
Cell phone		48	50.0
Smartphone (with internet)		7	7.3
E-book reader (Kindle, etc.)			
Total Weekly Usage of Social Media	96		
Do not use		6	6.3
0-2 hrs.		38	39.6
3-4 hrs.		20	20.8
5-6 hrs.		12	12.5
7-8 hrs.		11	11.5
9+ hrs.		9	9.4
Importance of Social Media for 4-H	94		
Low importance		3	3.2
Slightly important		11	11.7
Neutral		11	11.7
Moderately important		21	22.3
Very important		35	37.2
Extremely important		13	13.8

Note: *Participants were asked to select all that apply

County program leaders were also asked whether or not they officially used social media to promote their county program or interact with 4-H members, volunteers and other adults in their county (see Table 3). Eighty-four percent

(*n* = 94) of county 4-H program leaders utilized social media to help promote their county program or interact with their clientele. Additionally, 80.5% (*n* = 77) of counties utilized social media to interact with 4-H members,

volunteers and other adults. 4-H program leaders in 11 counties (14.3%, $n = 77$) reported their county did not currently use social media, but had considered using it in the future.

Of the counties that officially utilized social media, 70.8% used social media at least once per week, while an additional 24.1% reported using social media every few weeks (see Table 4). Social media was most commonly used for direct communication with 4-H members (72.1%, $n = 79$), in-direct communication with 4-H members (69.0%, $n = 79$), and direct

communication with volunteers and adult leaders (67.0%, $n = 79$).

In regard to their county 4-H program's ability to successfully use social media, a majority of the program leaders somewhat agreed or agreed that social media was utilized effectively and efficiently (see Table 5). Overall, county 4-H program leaders in Tennessee somewhat agreed or agreed with their counties social media usage.

Table 3

Official Social Media Usage by Program Leader and by County Program

Variable	<i>n</i>	<i>f</i>	%
Officially Utilize Social Media by Program Leader	94		
Yes		79	82.3
No, but have considered		14	14.6
No, and have not considered		1	1.0
Officially Utilize Social Media by County	77		
Yes		62	80.5
No, but have considered		11	14.3
No, and have not considered		1	1.3
Mixed Response		3	3.9

Table 4

Description of Usage of Social Media by County 4-H Program Leaders in Tennessee

Variable	<i>n</i>	<i>f</i>	%
Frequency of Social Media Use	79		
Several times a day		2	2.5
About once a day		5	6.3
3-5 times per week		18	22.8
1-2 times per week		31	39.2
Every few weeks		19	24.1
Less often		4	5.1
How Sites Are Used*	79		
Direct communication with 4-H members		57	72.1
Direct communication with volunteers\adult leaders		53	67.0
In-direct communication with 4-H members		55	69.6
In-direct communication with 4-H volunteers\adult leaders		50	63.3
Sharing\Mass Communication		53	67.0

Note. *Participants were asked to select all that apply.

Objective 3: Determine perspectives towards current and future social media usage for 4-H as shown by the county 4-H program leaders.

Table 5

County Usage of Social Media as Perceived by County 4-H Program Leaders in Tennessee

	Strongly disagree		Disagree		Somewhat disagree		Neutral		Somewhat agree		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
My county 4-H program has the resources necessary to use social media.	1	1.0	3	3.0	5	5.1	2	2.0	16	16.2	48	48.5	22	22.2
My county 4-H program has the knowledge necessary to use social media.	1	1.0	6	6.1	6	6.1	5	5.1	28	28.3	38	38.4	13	13.1
I believe that county 4-H members are satisfied with the way our county uses social media.	3	3.0	19	19.2	9	9.1	30	30.3	23	23.2	10	10.1	3	3.0
I believe that my county 4-H program uses social media very efficiently.	2	2.0	21	21.2	16	16.2	19	19.2	23	23.2	13	13.1	3	3.0
I believe that my county 4-H program uses social media very effectively.	2	2.0	19	19.2	16	16.2	22	22.2	25	25.3	11	11.1	2	2.0
I am very satisfied with the way my county uses social media.	6	6.1	19	19.2	20	20.2	14	14.1	24	24.2	10	10.1	4	4.0
My county 4-H program feels apprehensive about using social media.	3	3.0	28	28.3	16	16.2	15	15.2	22	22.2	9	9.1	2	2.0
My county 4-H program hesitates to use social media because of online privacy concerns.	6	6.1	33	33.3	10	10.1	20	20.2	21	21.2	3	3.0	4	4.0

Note. 1-strongly disagree, 2-disagree, 3-somewhat disagree, 4-neutral, 5-somewhat agree, 6-agree, and 7-strongly agree.

Questionnaire items also assess the county program leaders' willingness to engage in using social media and participate in training opportunities related to social media (see Table 6). Program leaders disagreed with the statement that they had no interest in using social media for their county. They also somewhat disagreed that they would like to use social media but lacked the needed knowledge. In reference to participating in social media training, program leaders mostly somewhat agreed that they would be willing to participate in online regional and state training opportunities. In addition, program leaders somewhat agreed that they were willing to learn about social media and then share their

knowledge with Cooperative Extension employees.

Five questions based on the perceived usefulness scale by Kattan and Adams (1994) were utilized to measure the program leaders' perceptions of the usefulness of social media (see Table 7). To that end, county 4-H program leaders perceived social media to be moderately useful ($M = 4.71$, $SD = 1.56$). A majority of the program leaders somewhat agreed, agreed, or strongly agreed that social media enhanced their effectiveness on the job, allowed tasks to be accomplished more quickly, made their job easier, increased their productivity, and improved their job performance.

Table 6

County 4-H Program Leaders' Willingness to Participate in Training

	Strongly disagree		Disagree		Somewhat disagree		Neutral		Somewhat agree		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
I would be willing to participate in an online training session to learn how to use social media for my program.	0	0.0	2	2.1	1	1.0	20	20.8	31	32.3	27	28.1	13	13.5
I would be willing to learn about social media and then share my knowledge with fellow Cooperative Extension employees.	0	0.0	0	0.0	6	6.3	18	18.8	30	31.3	27	28.1	13	13.5
I would be willing to attend a regional training meeting to learn how to use social media for my program.	0	0.0	3	3.1	7	7.3	17	17.7	21	21.9	29	30.2	17	17.7
I would be willing to attend a statewide training meeting to learn how to use social media for my program.	6	6.3	5	5.2	8	8.3	25	26.0	24	25.0	17	17.7	9	9.4
I would be willing to use social media for my county program, but do not know how.	21	21.9	22	22.9	4	4.2	19	19.8	19	19.8	7	7.3	2	2.1
I have no interest in using social media for my county program.	40	41.7	35	36.5	9	9.4	4	4.2	6	6.3	0	0.0	0	0.0

Note. 1-strongly disagree, 2-disagree, 3-somewhat disagree, 4-neutral, 5-somewhat agree, 6-agree, and 7-strongly agree.

Table 7

County 4-H Program Leaders' Perceptions of the Usefulness of Social Media

	Strongly disagree		Disagree		Somewhat disagree		Neutral		Somewhat agree		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Using social media enhances my effectiveness on the job.	4	4.2	5	5.2	4	4.2	19	19.8	24	25.0	29	30.2	9	9.4
Using social media allows me to accomplish tasks more quickly.	5	5.2	6	6.3	7	7.3	23	24.0	20	20.8	19	19.8	14	14.6
Using social media makes it easier to do my job.	4	4.2	7	7.3	8	8.3	21	21.9	19	19.8	24	25.0	11	11.5
Using social media increases my productivity.	4	4.2	7	7.3	5	5.2	27	28.1	23	24.0	17	17.7	11	11.5
Using social media improves my job performance.	4	4.2	8	8.3	2	2.1	30	31.3	17	17.7	24	25.0	8	8.3

Conclusions, Implications and Recommendations

This study indicates that social media has become a widely adopted technology for county 4-H programs in Tennessee, and was utilized by the majority of county 4-H program leaders. While Rhoades et al. (2009) found that 4-H social media use was primarily youth led, this study supports research by Fuess and Humphreys (2011) which indicated there has been some level of adoption of social media for official usage by county 4-H program leaders.

Social networking sites were the key social media service used by county 4-H program leaders. Of the county program leaders who officially utilized social media, the majority of program leaders utilized social networking sites, such as Facebook, on at least a weekly basis, and a very few program leaders indicated that they had never used social networking for their county program. This finding is consistent with results found by Curtis et al. (2010) in which social networking was the second most commonly used social media service for nonprofits following only email (which was not included in this study).

A potential need for training in social media usage and updating social media technology and resources was also identified. While a high percentage of program leaders engaged in using social media for their county, they expressed only a moderate level of agreement that their county possessed the knowledge and resources necessary to utilize social media. Some participants specifically indicated they lacked the technical knowledge necessary to efficiently and effectively utilize social media for their county program. Likewise, respondents somewhat disagreed they were very satisfied with the way their program was currently utilizing social media or believed their 4-H clientele were satisfied by their current usage of social media. Participants also indicated that they would be at least somewhat willing to participate in online, regional or statewide training opportunities. Lack of technical knowledge and need for training are consistent with findings from the Fuess and Humphreys (2011) study which identified barriers, risks and

opportunities for utilizing social media for Cooperative Extension.

This research study was designed to measure the diffusion and adoption of social media among county 4-H programs in Tennessee based on the theoretical framework of diffusion models established by Rogers (1995). As stated earlier, this process of adoption can be viewed from an individual or organizational standpoint. Because this study is intended to measure adoption across an organization, the organizational process of innovation proves to be the most helpful in describing the current state of social media adoption by Cooperative Extension and 4-H. As described previously, the organizational innovation process can be divided into two key phases (initiation and implementation) and five subordinate stages (agenda-setting, matching, redefining/restructuring, clarifying and routinizing). The changing landscape of communication among constituents has served as a strong agenda-setting motivator for Cooperative Extension and 4-H to prioritize social media adoption. The National 4-H Council has initiated training programs to encourage adoption of this new technology to help 4-H reach a larger, more diverse audience (2011). In addition, a variety of Cooperative Extension and 4-H programs have also succeeded in finding effective ways to incorporate social media and match these new technologies to existing communication needs in their programs (Kinsey, 2010; National 4-H Council, 2010). Results of this diffusion study, combined with prior research on Cooperative Extension and 4-H usage of social media, indicate that the organizational decision to adopt social media technologies has been made and social media adoption may continue to the second phase of the innovation process. This may prove challenging, however, because many of the factors that are beneficial during the initiation phase can prove to be quite negative during the implementation stage. For instance, during the initiation process, organizations may benefit from low centralization, high complexity, and low formalization. During the implementation phase, however, an organization would benefit from high centralization, low

complexity, and high formalization (Rogers, 1995). These factors may have an effect on the successfulness of the implementation of social media by the organization as a whole.

While this study provides some insight into the way that county 4-H programs are currently implementing social media, further research is encouraged to determine how these new technologies can best be utilized to support the Cooperative Extension system and serve established and new clientele. Analysis of participants overall perceptions of social media showed strong support of previous findings indicating that social media could prove to be a highly beneficial promotional and communication tool for county 4-H programs and other Cooperative Extension personnel (Coates, 2004; Fuess & Humphreys, 2011; Rhoades et al., 2009). Further research is suggested to determine best practices for utilizing social media to maximize the benefit to the organization. This may include research on which social media services are the best fit for 4-H use and/or how to most efficiently and effectively utilize these services.

This study may also provide a foundation for other researchers to more effectively isolate perceived barriers and risks to usage of social media. Results of this study indicate support for several barriers of social media usage as identified by Fuess and Humphreys (2011). Additional research should be conducted to further identify how to decrease these barriers in order to improve the social media adoption process in Cooperative Extension and 4-H.

Finally, this study provides interesting insight into social media adoption by 4-H as part of the Cooperative Extension organization.

Results of this study support findings by Murphey et al. (2012) that technology acceptance is not consistent across social media platforms. While the study by Murphey et al. shows that content management systems are most accepted for agricultural education uses, this study supports findings by Fuess & Humphreys (2011), Hill et al. (2012) and Russell et al. (2012) that social networking (i.e. Facebook) is most accepted by Cooperative Extension professionals. Learning to effectively utilize the social media tools and technologies that are accepted by target audiences can help agricultural education professionals best develop training programs to help prepare college students for careers in agricultural education or extension. Based on the findings of this study, as supported by Fuess & Humphreys (2011), Hill et al. (2012) and Russell et al. (2012), those training future and current extension professionals should ensure that educational opportunities are presented to provide training on utilizing Facebook in a safe, efficient and effective manner. Based on the findings of these studies, we can see that use of Facebook is a key communication competency for Cooperative Extension professionals in order to reach clientele and stakeholders efficiently and effectively. Therefore, it is strongly suggested that training in social media, specifically Facebook, be incorporated into Cooperative Extension education programs and that in-service training opportunities be provided. Future research on acceptance of social media technologies in agricultural education and extension fields is strongly encouraged to further determine best practices for social media use.

References

- Agunga, R. (1993). Communication training needs of agricultural and extension education graduates: a survey of association of agricultural and extension education members. *Journal of Agricultural Education*, 34(3), 84-92. doi: 10.5032/jae.1993.03084
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education (8th ed.)*. Belmont, CA: Wadsworth Cengage Learning.
- Avery, E., Lariscy, R., Amador, E., Ickowitz, T., Primm, C., & Taylor, A. (2010). Diffusion of social media among public relations practitioners in health departments across various community population sizes. *Journal of Public Relations Research*, 22(3), 336-358. doi: 10.1080/10627261003614427

- Borden, L., & Harris, W. (1998). An occupational analysis comparing 4-H youth development agents serving traditional and non-traditional clientele. *Journal of Agricultural Education*, 39(4), 53-64. doi: 10.5032/jae.1998.04053
- Cavazza, F. (2010). *Social Media Landscape 2011* [infographic]. Retrieved from www.fredcavazza.net/2010/12/14/social-media-landscape-2011/
- Coates, D. (2004). Weblogs as a disruptive technology for extension. *Journal of Extension*, 42(3). Retrieved from <http://www.joe.org/joe/2004june/comm1.php>
- Curtis, L., Edwards, C., Fraser, K. L., Gudelsky, S., Holmquist, J., Thornton, K., & Sweetser, K. D. (2010). Adoption of social media for public relations by nonprofit organizations. *Public Relations Review*, 36 (1), 90-92. doi:10.1016/j.pubrev.2009.10.003
- Doefert, D. (Ed.) (2011). *National research agenda: American Association for Agricultural Education's research priority areas for 2011-2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.
- Doerfert, D., Graber, L., Myers, C., & Irlbeck, E. (2012). *Traditional and social media channels used by Texas agricultural producers*. Research poster presented at the American Association for Agricultural Educators National Research Conference, Asheville, NC. Retrieved from http://aaaeonline.org/uploads/allconferences/5-17-2012_790__2012_AAEE_Research_Proceedings.pdf
- Frambach, R. T., & Schillewart, N. (2002). Organizational innovation adoption: A multi-level framework of determinants and opportunities for future research. *Journal of Business Research*, 55, 163-176.
- Fuess, L. L., & Humphreys, L. (2011). *An analysis and recommendations of the use of social media within the Cooperative Extension System: opportunities, risks, and barriers* (Unpublished honor's thesis). Cornell University, Ithaca, NY. Retrieved from <http://dspace.library.cornell.edu/bitstream/1813/2312912/Fuess,%20Lucas%20-%20Research%20Honors%20Thesis.pdf>
- Hill, A., Bailey, N., Arnold, S., & Myers, C. (2012). *Extension's online presence: are land-grant universities promoting the tripartite mission?* Research poster presented at the American Association for Agricultural Educators National Research Conference, Asheville, NC. Retrieved from http://aaaeonline.org/uploads/allconferences/5-17-2012_790__2012_AAEE_Research_Proceedings.pdf
- Howe, N., & Strauss, W. (2000). *Millennials rising: the next great generation*. New York, NY: Vintage Books.
- Hull, C. E., & Lio, B. H. (2006). Innovation in non-profit and for-profit organizations: visionary, strategic, and financial considerations. *Journal of Change Management*, 6(1), 53-65. doi: 10.1080/14697010500523418
- Jaskyte, K., & Dressler, W. W. (2005). Organizational culture and innovation in non-profit human service organizations. *Administration in Social Work*, 29(2), 23-41. doi: 10.1300/J147v29n02_03
- Kattan, M. W., & Adams, D. A. (1994). Explaining information technology use with the usefulness scale: A comparison with user age. *Proceedings of the annual symposium on computer application (sic) in medical care*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/7950037>
- Katz, E., Levine, M. L., & Hamilton, H. (1963). Traditions of research on the diffusion of innovation. *American Sociological Review*, 28(2), 237-253. Retrieved from <http://www.jstor.org/stable/2090611>

- Kinsey, J. (2010). Five social media tools for the Extension toolbox. *Journal of Extension*, 48(5). Retrieved from <http://www.joe.org/joe/2010october/tt7.php>
- Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media & mobile internet use among teens and young adults. *Pew Internet and American Life project*. Retrieved from <http://pewresearch.org/pubs/1484/social-media-mobile-internet-use-teens-millennials-fewer-blog>
- Liebreznz-Himes, M. L., Dyer, R. F., & Shamma, H. M. (2009). Diffusion of innovations as illustrated by today's social media explosion: Did Rogers know best?. *Proceedings of the Conference on Historical Analysis and Research in Marketing*, 14(1), 37-39. Retrieved from <http://faculty.quinnipiac.edu/charm/CHARM%20proceedings/CHARM%20article%20archive%20pdf%20format/Volume%2014%202009/liebreznz-himes%20dyer%20shamma.pdf>
- Moore, L., & Rudd, R. (2004). Leadership skills and competencies for extension directors and administrators. *Journal of Agricultural Education*, 45(3), 22-33. doi: 10.5032/jae.2004.03022
- Murphrey, T., Rutherford, T., Doerfert, D., Edgar, L., & Edgar, D. (2012). Technology acceptance related to Second Life, social networking, Twitter, and content management systems: are agricultural students ready, willing and able? *Journal of Agricultural Education*, 53(3), 56-70. doi: 10.5032/jae.2012.03056
- National 4-H Council. (2010). *4-H.org*. Retrieved from www.4-h.org
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.
- Rhoades, E., Thomas, J. R., & Davis, A. (2009). Social networking among youth: How is 4-H represented? *Journal of Extension*, 47(5). Retrieved from <http://www.joe.org/joe/2009october/a6.php>
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: The Free Press.
- Rogers, E. M., & Shoemaker, F. F. (1971). *Communication of innovations: A cross-cultural approach*. New York, NY: The Free Press.
- Russell, M., Reynolds, B., Washburn, N., & Chumbley (2012, May). County extension agents' methods of communicating 4-H and extension programs in Arkansas. *Proceedings of the American Association for Agricultural Educators Research Conference, Asheville, North Carolina*, 39, 46. Retrieved from http://aaaeonline.org/uploads/allconferences/5-23-2012_23_abstracts2012.pdf
- Scheer, S., Cochran, G., Harder, A., & Place, N. (2011). Competency modeling in extension education: integrating an academic extension education model with an extension human resource management model. *Journal of Agricultural Education*, 52(3), 64-74. doi: 10.5032/jae.2011.03064
- Seger, J. (2011). The new digital [st]age: barriers to the adoption and adaptation of new technologies to deliver extension programming and how to address them. *Journal of Extension*, 49(1). Retrieved from <http://www.joe.org/joe/2011february/a1.php>

REBEKAH D. BOWEN is a County Extension Agent, 4-H and Youth Development, with University of Georgia Cooperative Extension in Burke County, P.O. Box 300, Waynesboro, GA 30830, rbowen1@uga.edu

CARRIE A. STEPHENS is an Associate Professor in the Department of Agricultural Leadership, Education and Communications at the University of Tennessee, 320B Morgan Hall, 2621 Morgan Circle, Knoxville, TN 37996-4511, cfritz@utk.edu

COURTNEY C. CHILDERS is an Associate Professor of Advertising in the College of Communication and Information at the University of Tennessee, 476 Communications Building, Knoxville, TN 37996-0343, childers@utk.edu

ELIZABETH J. AVERY is an Associate Professor of Public Relations in the College of Communication and Information at the University of Tennessee, 401-F Student Services Bldg., Knoxville, TN 37996-0200, eavery@utk.edu

CHRISTOPHER T. STRIPLING is an Assistant Professor in the Department of Agricultural Leadership, Education and Communications at the University of Tennessee, 320B Morgan Hall, 2621 Morgan Circle, Knoxville, TN 37996-4511, cstripling@utk.edu