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Extension Youth Educators' Technology Use in Youth Development Programming

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Abstract

The purpose of this descriptive-correlational study was to determine the use of technology in youth programming by Extension youth development educators in Louisiana, Mississippi, and Tennessee. Data were collected via e-mail and a SurveyMonkey© questionnaire. Extension educators are using some technology in youth development programming. More than three-fourths of Extension youth educators are using Facebook; however, less than one fourth of Extension youth educators are using Twitter which contradicts previous research. Having technology available for use explains a medium amount of the technology use among Extension youth educators; however, perceived barriers, anxiety, age, gender, years of experience, and sources of technology training do not explain Extension youth educators technology use in their programming. Extension youth educators fit the description of digital immigrants who assume that today's learners acquire knowledge the same way they learned when they were in school.

Keywords: extension, youth development, technology

Over the past decade, our society has become increasingly dependent on technology. Since 2000, the rapid advances in technology have taken our society from being primarily dependent on the written and spoken word to being more dependent on communication through the air, including e-mail, text messaging, and the World Wide Web (Prensky, 2001a, 2001b). In fact, the introduction of the Internet has not only changed the home, but it has also changed the workplace and educational settings (Fraze, Fraze, Kieth, & Baker, 2002; Lokken, Cheek, & Hastings, 2003). Prensky (2001a) coined the term digital native as those who grew up with and are native speakers of the language of technology. Digital natives prefer interaction and communication via digital technologies (Prensky, 2001a). Conversely, digital immigrants were introduced to and adopted technology at a later point in their life. Further, digital immigrants assume that today's learners acquire knowledge the same way students did when they were in school (Bennett, Maton, & Kervin, 2008; Prensky, 2001a).

However, technology has changed students' learning techniques and interests. As a result, teachers must be willing to adapt to these changes to better serve today's learners (Bennett et al., 2008; Prensky, 2001a, 2001b; Rhoades, Thomas, & Davis, 2009). Dooley and Murphy

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(2001) found that educators valued technology and believed that it played a significant role in the learning process. Further, educators believed that education could be improved by increasing technology use because learners prefer learning to be more visual; however, they did not believe that technology will impact the information that is taught (Dooley & Murphy, 2001).

Although using technology may save time and appeal to today's learners, educators must have a clear understanding of how to use technology efficiently and effectively in the teaching and learning process (TLP) to provide the best learning experience for learners (Peckham & Iverson, 2000). Like formal educators, Extension educators must be willing to learn about the appropriate uses of technology, methods by which technology can make programming more efficient, and the long-term benefits of using technology in their programming (Seger, 2011). Further, Extension administrators should encourage and emphasize the importance of technology use if Extension educators at the local level are to be successful at integrating technology into their programming (Diem, Hino, Martin, & Meisenbach, 2011; Seger, 2011).

While Extension has traditionally conducted programs face-to-face, Gregg and Irani (2004) suggested that Extension educators are experiencing a shift in the way they carry out their duties due to the technology avenues that are available. In a study that focused on agricultural and Extension education faculty members' use of technology, Flood and Conklin (2003) found that Extension educators believed that learners and educators alike are positively impacted by the use of technology in the learning process. In fact, a majority of the Extension educators studied indicated that they were using computers, email, Internet, and presentation software to reach clientele in Extension programming (Gregg & Irani, 2004). Additionally, Dooley and Murphy (2001) and Peake, Briers, and Murphy (2005) found that educators felt confident using basic technology in the educational process including Internet, email, word processing, presentation graphics, projection devices, and videoconferencing. Delivering Extension programming online offers flexibility to clientele because they can access educational information at their own convenience (Green, 2012). Further, use of webinars to deliver Extension programming offered a multitude of benefits including cost-effective and time-efficient programming, easier collaboration among Extension personnel and clientele, and opportunity to reach new clientele with programming (Rich et al., 2011). On the other hand, Extension educators were less confident in their ability to create and maintain their own webpages, record digital sound into presentations, and teach courses via the web (Dooley & Murphy, 2001; Peake et al., 2005).

In regard to newer technologies, O'Neill, Zumwalt, and Bechman (2011) found that a majority of Extension educators were using Facebook, Twitter, and YouTube on their phones and computers to conduct Extension programming. In fact, horticulture lessons provided by Extension educators via Facebook were found to engage learners, assist in achieving learning objectives, stimulate students' recollection of previous lessons, and encourage active learning among students (Strong & Alvis, 2011). Further, Extension educators indicated that using Facebook as a learning tool encouraged collaboration among learners and educators (Rhoades et al., 2009; Strong & Alvis, 2011). Because so many adults and youth use Facebook on a daily or almost daily basis (Van Grove, 2010), using Facebook as a tool to reach new clientele and communicate with existing clientele can save time and money (Rhoades et al., 2009; Robideau & Santl, 2011; Strong & Alvis, 2011).

Although Extension educators have adopted technology in their programming to a degree, Extension educators still perceived several barriers to integrating technology into the TLP including: (a) sufficient time to integrate technology into lessons, (b) adequate technology to accommodate all students, (c) accessibility of technical support, (d) lack of money to purchase technology, and (e) planning ample time for learners to use technology (Diem et al., 2009; Kotrlik & Redmann, 2005; Redmann & Kotrlik, 2004). In addition, Extension educators indicated that the lack of time to learn how to use technology in education and limited training opportunities were also barriers to incorporating technology into the TLP (Diem et al., 2011; Flood & Conklin, 2003). Further, Extension educators are not fully aware of the functionality of technology;

therefore, they are hesitant to incorporate technology into their programming (Diem et al., 2011; Seger, 2011). Extension educators also fear that using technology in their programming could diminish their own presence of teaching which could potentially turn away existing clientele (Diem et al., 2011; Seger, 2011). The common perception of Extension programming has shown to be a barrier to adopting technology as older clientele view programming primarily as an in-person event and younger clientele view programming as in person, online, and via social media (Rhoades et al., 2009; Seger, 2011). Drill (2012) suggested that Extension educators may be hesitant to use mobile technology to deliver Extension programming because it could potentially lessen instructional time with youth. Consequently, as the presence of perceived barriers increases, the adoption of technology decreases (Kotrlik & Redmann, 2005, 2009). Moreover, keeping up with new technology requires constant innovation and quick implementation, and Extension as an organization does not readily enable such innovation (Seger, 2011).

Seger (2011) suggested a way to reach both older and younger clientele in a way that is satisfying. Extension educators should use "high tech and high touch" methods to deliver programming (p. 5). Further, Extension educators could deliver newsletters and other monthly news via social media avenues while maintaining regular face-to-face contact with clientele. Therefore, Extension educators are still able to meet with their traditional clientele, but they also have the potential to reach hundreds to thousands more with an online presence (Seger, 2011).

While making an effort to reduce the presence of barriers, it is important to consider that educators experience a degree of anxiety toward technology use in the TLP (Kotrlik & Redmann, 2005, 2009; Redmann & Kotrlik, 2004). Research has shown that as anxiety toward technology increased, technology use in the TLP decreased (Fraze et al., 2002; Kotrlik & Redmann, 2005, 2009; Lokken, Cheek, & Hastings, 2003). Further, as educators' age increased, anxiety toward technology increased and technology use decreased (Fraze et al., 2002; Lokken et al., 2003).

Modern learners ". . . approach learning as a 'plug-and-play' experience: they are unaccustomed and unwilling to learn sequentially – to read the manual – and instead are inclined to plunge in and learn through participation and experimentation" (Flood & Conklin, 2003, p. 283). Accordingly, if educators want to be successful in reaching learners, they must realize that technology has become the reality of today (Lokken et al., 2003). Further, Extension educators must not only be willing to learn students' digital language, but also incorporate technology into teaching required competencies (Lokken et al., 2003; Prensky, 2001a, 2001b). Using technology in the TLP can produce students who are more motivated, productive, and empowered (Peckham & Iverson, 2000). Extension's mission is to take education to people. A majority of people today, especially those who are part of the digital generation, are online and using social media; therefore, to reach these clientele, Extension educators must be willing to take Extension programming to those avenues (Seger, 2011).

Theoretical Framework

The theoretical framework used for this study was Rogers' (2003) diffusion of innovation theory. An innovation is described as any object, practice, or idea that is perceived as new (Rogers, 2003). Innovation-decision is a process beginning when an individual first gains knowledge about an innovation. The individual then develops an attitude toward the innovation that leads to adoption or rejection of the innovation. Furthermore, the process continues with the individual implementing and confirming the innovation (Rogers, 2003). For this study, the process is operationalized through Extension educators' use of technology in youth development programming. Having an understanding of the Extension educators' stage in the process is helpful in encouraging their adoption of technology in youth development programming (Murphrey, Miller, & Roberts, 2009).

Rogers (2003) described five attributes that contributed to adoption of an innovation: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability.

Relative advantage is described as the degree to which an individual perceives an innovation as having an advantage over its predecessor (Rogers, 2003). If Extension educators perceive using technology in youth development programming is more advantageous than more traditional methods of delivery, technology will more likely be adopted in youth programming. Compatibility is described by Rogers (2003) as the degree to which an individual perceives an innovation to be compatible with his or her values, past experiences, and future needs. Extension educators' adoption of technology indicates a belief that technology is compatible with the educators' goals and needs for youth development programming.

Rogers (2003) describes complexity as the degree to which an individual perceives an innovation as too challenging to comprehend and use. The presence of perceived barriers toward using technology in youth development programming could present a sense of complexity to Extension educators. If Extension educators perceive lack of technical support, lack of age-appropriate instructional software, and limited ability to integrate technology into various types of programs, the educator may perceive technology as too complex to adopt into programming. Rogers (2003) described trialability as the process by which an innovation can be investigated on a trial basis and observability as the time when individuals can see results of an innovation. Often, individuals feel a sense of anxiety regarding technology use in the learning process (Kotrlik & Redmann, 2005, 2009; Redmann & Kotrlik, 2004). Providing Extension educators trialability and observability with technology could potentially reduce anxiety in the learning process. The availability of technology and technology training can also reduce Extension educators' anxiety toward technology use. Extension educators who have the option to try and observe technology through (a) workshops, (b) webinars, (c) college courses, and (d) other colleagues may be more likely to feel less anxiety toward technology and, subsequently, adopt technology into youth development programming. Therefore, Rogers' (2003) theory indicates that Extension educators who have the option of trialability and observability and believe that using technology has relative advantage and compatibility with their goals in youth programming will be more likely to adopt technology into their programming.

Purpose and Research Questions

The purpose of this descriptive-correlational study was to measure Extension youth development educators' use of technology in youth programming. This research study addresses Research Priority 2, "New Technologies, Practices and Products Adoption Decisions," of the American Association for Agricultural Education Research Agenda for 2011-2015 (Doerfert, 2011). Measuring Extension youth educators' technology use in youth development programming will assist researchers in providing opportunities for Extension youth educators to learn about new educational technologies which will facilitate in more effective programming for youth. Six research questions guided this study:

1. What were the personal and professional characteristics of Extension youth educators (e.g., age, gender, years of professional experience, sources and types of technology training, and current technologies used in youth development programming)?
2. To what extent did Extension youth educators use technology in youth development programming?
3. To what extent did Extension youth educators perceive selected factors as barriers to using technology in youth development programming?
4. To what extent were Extension youth educators experiencing anxiety toward using technology in youth development programming?
5. What relationships existed between Extension youth educators' use of technology in youth development programming and the following variables: perception of barriers to using technology, level of perceived anxiety toward technology, and selected personal

and professional characteristics (age, gender, years of professional experience, and sources of technology training)?

6. Did selected variables explain a statistically significant proportion of the variance in technology use by Extension youth educators? The variables used in this analysis were technology used by respondents, barriers to technology use, anxiety toward technology use, age, gender, years of professional experience, and sources and types of technology training.

Methods

Population and Sample

The target population for this study included Extension youth educators in Louisiana, Mississippi, and Tennessee (N = 308). These states were selected because of their similarities in youth development programs. A random sample of Extension youth educators was selected using Cochran's (1977) sample size formula (n = 190). Eight of the 190 Extension educators in the random sample were removed from the study as a result of frame error; the revised population was 300 and the revised sample size was 182. Responses were collected from 130 of the 182 Extension youth educators for a response rate of 71.43%. Five of the respondents provided incomplete data and three were determined to be outliers; therefore, there were 122 usable responses which represents a 67.03% usable response rate.

Instrumentation

The instrument used in this study was developed by Kotrlik, Redmann, and Douglas (2003). The original instrument was used to measure the technology adoption and availability, technology training, barriers to integrating technology, teaching effectiveness, anxiety toward technology use of agriscience teachers in the classroom. The researchers were given permission to use the instrument. The items in the instrument were modified to properly measure technology use by Extension youth educators in youth development programming, associated barriers to using technology, and perceived anxiety toward using technology. In addition, the instrument was further modified for online data collection via SurveyMonkey©.

A panel of experts composed of faculty members and doctoral level graduate students reviewed the instrument for face and content validity and revised based on the results of the review. Then, the instrument was pilot-tested with 50 Extension youth educators in Arkansas. Following the instrument review and pilot test, necessary revisions were made to the instrument, including changes to wording of items and instructions and omitting similar items.

The instrument contained 37 items and measured three constructs. A five point summated scale (1 = *Not like me,* 2 = *Very little like me,* 3 = *Some like me,* 4 = *Very much like me,* and 5 = *Exactly like me*) measured the first construct which contained 18 items that assessed participants' technology use in youth development programming. Additionally, an item was added for participants to select among 12 types of technology that are available for use in youth development programming. A four-point summated scale (1 = *Not a barrier,* 2 = *Minor barrier,* 3 = *Moderate barrier,* and 4 = *Major barrier*) measured the second construct which contained seven items that evaluated participants' perceptions of the magnitude of selected barriers to integrating technology into youth development programming. A five-point summated scale (1 = *No anxiety,* 2 = *Some anxiety,* 3 = *Moderate anxiety,* 4 = *High anxiety,* and 5 = *Very high anxiety*) measured the third construct which contained seven items that gauged participants' perceived level of anxiety towards using technology in the TLP. Additionally, the instrument contained four items that allowed participants to indicate their age, gender, years of professional experience, and sources and types of technology training.

The reliability of the scales for the constructs measured in this study were analyzed *ex post facto* using Cronbach's alpha coefficients. The reliability analysis yielded exemplary Cronbach's alpha coefficients according to the standards published by Robinson, Shaver and Wrightsman (1991): technology use $\alpha = .92$; barriers $\alpha = .82$; and anxiety $\alpha = .95$.

Data Collection

The researchers collected responses from the target population using Dillman, Smyth, and Christian's (2008) Tailored Design Method. All participants were contacted via a SurveyMonkey© email that described the purpose of the study and contained a link to the questionnaire. The non-respondents at the end of weeks one and two were contacted via SurveyMonkey© email. At the end of week three, a random sample of the remaining non-respondents were contacted via telephone to control for non-response error. To ensure that the results were representative of the target population, an independent samples *t*-test was used to compare respondents and non-respondents. No statistically significant differences were found for key variables between the respondent and non-respondent groups; therefore, data were combined for further analysis.

Data Analysis

The data analyses for research questions one through four involved computing descriptive statistics (e.g., means, percentages, frequencies, and standard deviations). Research question five was analyzed using Pearson product-moment correlation coefficients. Pearson *r* offers a significant index for demonstrating relationship (Ary, Jacobs, Sorensen, & Razavieh, 2010). The strength of relationships was determined using Davis' (1971) coefficient conventions: $r = .01$ to $.09$ = *Negligible*, $r = .10$ to $.29$ = *Low*, $r = .30$ to $.49$ = *Moderate*, $r = .50$ to $.69$ = *Substantial*, and $r \geq .70$ = *Very Strong*. Research question six was analyzed using forward multiple regression analysis. According to Ary et al. (2010), multiple regression identifies relationships among several variables, allowing researchers to find the most significant correlation between independent and dependent variables. A statistical significance level of .05 was established *a priori* for all statistical tests.

Findings

Research question one sought to describe the Extension educators' personal and professional characteristics ($N = 122$). Of the respondents, 43 (35.2%) were male and 79 (64.8%) were female. The respondents' mean age was 39 years of age ($SD = 10.6$), and the mean years of experience among respondents was 11 ($SD = 9.2$). Regarding sources of technology training, a majority of respondents (116, 95%) indicated being self-taught, and over three-fourths (106, 87%) self-selected workshops and conferences as a source of training. Further, two-thirds (85, 70%) of respondents reported the use of colleagues, over one-third (57, 47%) indicated college courses, more than one-fourth (41, 34%) identified webinars, and less than one-fourth (23, 19%) reported eXtension as sources of training.

Extension educators were asked to select which technologies they used in youth development programming from a provided list of 12 technologies. More than three-fourths of respondents indicated use of the first four technologies in youth development programming as shown in Table 1, digital photo cameras ($f = 110$, 90%), text messaging ($f = 110$, 90%), Facebook ($f = 106$, 87%) and DVD or CD players ($f = 92$, 76%). Nearly three-fourths of the respondents identified use of smart phones ($f = 90$, 71%), and more than one-third of respondents documented using digital video cameras ($f = 47$, 39%) in youth development programming. The remaining six

technologies listed were reported to be used by less than one-third of Extension youth educators (see Table 1).

Table 1

Technology Used by Extension Youth Educators in Youth Development Programming

Instructional Technologies	#	%
Digital photo camera	110	90.2
Text messaging	110	90.2
Facebook	106	86.9
DVD or CD players	92	75.4
Smart phone (e.g., Phone, Android, Blackberry, etc.)	87	71.3
Digital video camera	47	38.5
Tablet computer (e.g., iPad, Galaxy Tab, Xoom, etc.)	34	27.9
CD or DVD recorder	31	25.4
Console gaming (e.g., Playstation, Wii, Xbox, Nintendo DS, etc.)	19	15.6
Twitter	19	15.6
Desktop computer gaming	11	9.0
Simulations (e.g., Second Life, etc.)	7	5.7

Note. N = 122. Number of technologies used: M = 5.52, SD = 1.68.

Research question two sought to determine what extent youth educators were using technology in youth development programming. This construct was measured using a five-point summated rating scale. The real limits of the scale were 1.00 to 1.49 = *Not like me*, 1.50 to 2.49 = *Very little like me*, 2.50 to 3.49 = *Some like me*, 3.50 to 4.00 = *Very much like me*, and 4.00 to 4.50 = *Exactly like me*. Data are reported using summated means by item and construct (see Table 2). A summated mean for all technology use items was calculated which yielded a composite mean of 3.38 (SD = .56), indicating that Extension educators perceived items in the technology use scale as "*Some*" like them. When technology use items were analyzed, respondents rated "I use projection devices to give presentations, demonstrations, or lectures" highest (M = 4.03, SD = .81). Extension educators rated "Technology allows me to be a facilitator of learning rather than the source of all learning" as the second highest (M = 3.64, SD = .74), and the third highest rated item was "I expect youth to use technology so they can take on new challenges beyond traditional projects" (M = 3.57, SD = .74). However, the item with the lowest mean as indicated respondents was "I encourage youth to design their own technology-based projects" (M = 2.77, SD = .85) (see Table 2).

Table 2

Technology Use in Youth Development Programming by Extension Youth Educators

Item	*M*	*SD*
I use projection devices to give presentations, demonstrations, or lectures.	4.03	.81
Technology allows me to be a facilitator of learning rather than the source of all learning.	3.64	.74
I expect youth to use technology so they can take on new challenges beyond traditional projects.	3.57	.74
I encourage youth to use technology to collaborate with other youth.	3.52	.85
I encourage youth to use the computer to do project-area learning activities.	3.52	.89
I encourage youth to use online multimedia resources (such as video, audio, or interactive programs.)	3.48	.86
I expect youth to use technology to enable them to be self-directed learners.	3.48	.73
I expect youth to use technology so they develop projects that are of a higher quality level than would be possible without them using technology.	3.40	.85
I pursue innovative ways to incorporate technology into programming with youth.	3.38	.88
I use technology to encourage youth to share the responsibility for their own learning.	3.36	.89
I emphasize the use of technology as a learning tool in my programs.	3.34	.79
I encourage youth to use various digital devices, smart phones, or tablet computers in projects.	3.34	.98
I use technology as a standard learning tool for youth.	3.33	.73
I expect youth to fully understand the unique role that technology plays in their learning.	3.25	.87
I often encourage youth to use e-mail to contact experts about projects.	3.24	1.03
I discuss with youth how they can use technology as a learning tool.	3.19	.83
I design educational programs that result in youth being comfortable using technology in their learning.	3.07	.88
I encourage youth to design their own technology-based projects.	2.77	.85
Composite Mean:	3.38	.56

Note. (*N* = 122). 1 = *Not like me*, 2 = *Very little like me*, 3 = *Some like me*, 4 = *Very much like me*, and 5 = *Exactly like me*. Scale interpretation: 1.00 to 1.49 = Not like me, 1.50 to 2.49 = Very little like me, 2.50 to 3.49 = Some like me, 3.50 to 4.49 = Very Much Like Me, and 4.50 to 5.00 = *Exactly Like Me*.

Research question three sought to determine what extent Extension youth educators perceived selected factors as barriers to using technology in youth development programming. The items in this scale were measured using a four-point summated rating scale. The real limits of this scale were 1.00 to 1.49 = *Not a barrier*, 1.50 to 2.49 = *Minor barrier*, 2.50 to 3.49 = *Moderate barrier*, and 3.50 to 4.00 = *Major barrier*. The summated mean for all items in the barrier scale was 2.38 (*SD* = .56), which indicates that Extension educators perceive the factors in this scale to be "*Not a barrier*" (Table 3). Extension youth educators reported that "Availability of technology for the number of youth participating in my programs" (*M* = 2.91, *SD* = .79) and "Availability of technical support to effectively use instructional technology in my programs" (*M* = 2.65, *SD* = .84) were moderate barriers. The remaining five barriers listed were rated as minor barriers (see Table 3).

Table 3

Extension Youth Educators' Perceived Barriers to Using Technology in Youth Development Programming

Item	*M*	*SD*
Availability of technology for the number of youth participating in my programs	2.91	.79
Availability of technical support to effectively use instructional technology in my programs.	2.65	.84
Availability of age-appropriate instructional software	2.34	.77
My ability to integrate technology in my programs	2.25	.82
Administrative support for integration of technology in my programs	2.22	.89
Type of programs I facilitate	2.20	.74
Youth's ability to use technology in my programs	2.08	.79
Composite Mean:	2.38	.56

Note. (*N* = 122). 1 = *Not a barrier*, 2 = *Minor barrier*, 3 = *Moderate barrier*, and 4 = *Major barrier*. Scale interpretation: 1.00 to 1.49 = *Not a barrier*, 1.50 to 2.49 = *Minor barrier*, 2.50 to 3.49 = *Moderate barrier*, and 3.50 to 4.00 = *Major barrier*.

Research question four sought to determine what extent Extension youth educators were experiencing anxiety toward using technology in youth development programming. The items in this scale were measured using a five-point summated rating scale. The real limits of this scale were 1.00 to 1.49 = *No anxiety*, 1.50 to 2.49 = *Some anxiety*, 2.50 to 3.49 = *Moderate anxiety*, 3.50 to 4.49 = *High anxiety*, and 4.50 to 5.00 = *Very high anxiety*. The summated mean for technology anxiety was 2.24 (*SD* = 1.03), demonstrating that Extension educators perceive "*Some anxiety*" toward technology. Regarding Extension educators' anxiety, all participants indicated that they experience some anxiety toward using technology in youth development programming. The highest rated statement (highest anxiety) was "How anxious do you feel when you cannot keep up with new technology?" (*M* = 2.43, *SD* = .1.25) (see Table 4).

Research question five asked sought to determine what relationships existed between Extension youth educators' use of technology in the youth development programming and the following variables: perception of barriers to using technology, level of perceived anxiety toward technology, and selected personal and professional characteristics (i.e., age, gender, years of professional experience, and sources of technology training). The data analysis revealed one statistically significant relationship (see Table 5). The variable technology use had a positive and moderate association with technology availability.

Table 4

Anxiety Perceived by Extension Youth Educators toward Using Technology in Youth Development Programming

Item	*M*	*SD*
How anxious do you feel when you cannot keep up with new technology?	2.43	1.25
How anxious do you feel when you attempt to use new options on various technologies?	2.31	1.07
How anxious do you feel when you are faced with using new technology?	2.31	1.17
How anxious do you feel when someone uses a technology term that you do not understand?	2.23	1.11
How anxious do you feel when you fear you may break or damage the technology you are using?	2.22	1.25
How anxious do you feel when you try to learn technology related skills?	2.11	1.11
How anxious do you feel when you think about your technology skills compared to the skills of other Extension youth educators?	2.10	1.14
Composite Mean:	2.24	1.03

Note. (*N* = 122). 1 = *No anxiety*, 2 = *Some anxiety*, 3 = *Moderate anxiety*, 4 = *High anxiety*, and 5 = *Very high anxiety*. Scale interpretation: 1.00 to 1.49 = *No anxiety*, 1.50 to 2.49 = *Some anxiety*, 2.50 to 3.49 = *Moderate anxiety*, 3.50 to 4.49 = *High anxiety*, and 4.50 to 5.00 = *Very high anxiety*.

Table 5

Relationships between Extension Educators' Technology Use, Technology Availability, Perceived Barriers, Anxiety and Personal and Professional Characteristics

Variable	*r*	*p*	Effect size interpretation
Technology availability	.46[c]	<.001	Moderate
Barriers	-.18[a]	.052	N/A
Technology training	.16[a]	.075	N/A
Anxiety	-.14[a]	.117	N/A
Gender	.04[b]	.678	N/A
Age	.04[a]	.663	N/A
Years of experience	-.02[a]	.795	N/A

Note. (*N* = 122).
[a]Pearson Product Moment correlation. [b]Point bi-serial correlation. [c]The strength of relationships was determined using Davis' (1971) coefficient conventions: *r* = .00 to .09 = *Negligible*, *r* = .10 to .29 = *Low*, *r* = .30 to .49 = *Moderate*, *r* = .50 to .69 = *Substantial*, and *r* ≥ .70 = *Very Strong*.

Research question six sought to determine if selected variables explain a statistically significant proportion of the variance in technology use by youth educators. The dependent variable in the forward regression analysis was the technology use scale mean. The potential explanatory variables were barriers, anxiety, technology availability, age, gender, years of professional experience, and sources of technology training. One variable, technology availability (R^2 = .21), explained a medium amount of the variance in technology use (Cohen, 1988). However, barriers, anxiety, age, gender, years of experience, and sources of technology

training did not enter the model. The overall model represents a medium effect size (Cohen, 1988) (see Table 6).

Table 6

Forward Multiple Regression Model Summary for Technology Use in Youth Development Programming

Source	*SS*	*df*	*MS*	*F*	*P*
Regression	7.82	1	7.82	31.5	<.001
Residual	29.76	20	.25		
Total	37.58	21			

					Change Statistics		
Variable	*R*	R^2	Adjusted R^2	*SE*	R^2 change	*F* change	*P* of *F* change
Technology availability	.46	.21	.20	.50	.21	31.55	<.001

Note. (*N* = 122). Dependent Variable: Technology Use. Predictor: Technology Availability.

Conclusions

The conclusions are limited to Extension youth development educators in the three states studied; namely, Louisiana, Mississippi, and Tennessee.

Extension youth educators in the three states range in age from 23 to 61 years with an average of 39 years; almost two-thirds are female. The educators have an average of 11 years of experience as youth development educators. According to Bennett et al. (2008), digital immigrants are those who were born prior to 1980 and who lack fluency in the technological language of their counterparts. Therefore, it was concluded that a majority of the Extension educators are digital immigrants and were self-taught regarding technology training, consistent with Bennett et al. (2008) and Prensky (2001a, 2001b) who stated that digital immigrants must be willing to learn how to use technology to reach digital natives.

Extension educators in the three states are using some technology in youth development programming, directly supporting previous studies on technology use in the teaching/learning process (Kotrlik & Redmann, 2005, 2009; Kotrlik et al., 2003). More than three-fourths of Extension educators are using Facebook which is consistent with conclusions from a study on social media use by Extension educators by O'Neill et al. (2011) who stated that a majority of Extension educators were using Facebook. However, less than one fourth of Extension educators are using Twitter, contradicting conclusions by O'Neill et al. (2011) who found that more than half of Extension educators were using Twitter in youth development programming.

Extension educators perceive that only minor barriers exist to using technology in youth development programming. This conclusion supports previous studies by Kotrlik and Redmann (2005, 2009), Kotrlik et al. (2003), and Redmann and Kotrlik (2004) that concluded that agricultural, career and technical education, and adult education teachers perceive no substantial barriers to using technology in the learning process. Extension educators experience some anxiety toward using technology in youth development programming which is consistent with the findings of studies of career and technical education teachers' technology anxiety (Kotrlik & Redmann, 2005, 2009; Redmann & Kotrlik, 2004). Having technology available for use explains a medium amount of the technology use among Extension educators
(Cohen, 1988) which is consistent with Kotrlik and Redmann's (2009) study of career and technical educators. Perceived barriers, anxiety, age, gender, years of experience, and sources of

technology training do not explain Extension youth educators technology use in their programming. This is also consistent with Kotrlik and Redmann's (2009) study of career and technical education teachers in which they found that gender, sources of technology training and years teaching experience did not explain technology use in instruction.

Implications

Extension educators see value in using various technologies in programming. However, Extension educators are not using technology to a great degree. Technologies such as text messaging, smart phones, and Facebook are used by a majority of Extension youth educators, yet less than half are using digital video cameras, tablets, and Twitter. Perhaps, that could be explained by an abundance of Extension educators who are digital immigrants and possibly less likely to use technology to a great degree and even less educated on the use of technology than their counterparts in other educational fields. Further, Extension educators may perceive some youth programming opportunities as being taught better and more efficiently without the use of technology. Consistent with Rogers' (2003) theory, Extension educators may be more willing to adopt more technologies if they are provided with opportunities for trialability and observability.

Recommendations

It is essential for Extension youth educators to use technology in their programming and to reach out to more youth as the youth they serve are part of the digital native generation (Prensky, 2001a, 2001b). Therefore, Extension youth educators should seek further training opportunities to become more proficient in incorporating technology in youth development programming. Further, Extension administration has a role in providing workshops and other training opportunities for Extension educators to learn to incorporate technology into their programming. Because the strongest perceived barrier to using technology in youth development programming is having technology available to youth, Extension youth educators and Extension administration should strive to acquire appropriate technology for use in Extension youth programming.

Further research is warranted on Extension youth educators from other states to better understand the extent of their technology use in youth development programming across the nation. Additional research addressing in which program areas educators are using technology would provide researchers a better understanding of training opportunities needed to expand technology use across youth development programming. A study should be conducted that compares youth satisfaction of 4-H programming in programs where technology is heavily used versus programs where technology is not heavily used.

References

Ary, D., Jacobs, L. C., Sorensen, C., & Razavieh, A. (2010). *Introduction to research in education* (8th ed.). Belmont, CA: Wadsworth, Cengage Learning.

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Technology*, *39*(5), 775–786. doi:10.1111/j.1467-8535.2007.00793.x

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). New York: John Wiley & Sons, Inc.

Cohen (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Diem, K. G., Hino, J., Martin, D., & Meisenbach, T. (2011). Is Extension ready to adopt technology for delivering programs and reaching new audiences? *Journal of Extension* [On-line], *49*(6), Article 6FEA1, Retrieved from http://www.joe.org/joe/2011december/a1.php

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method*. Hoboken, NJ: John Wiley & Sons, Inc.

Doerfert, D. L. (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.

Dooley, K. E., & Murphy, T. H. (2001). College of Agriculture faculty perceptions of electronic technologies in teaching. *Journal of Agricultural Education*, *42*(2), 1–10.

Drill, S. L. (2012). Mobile applications for Extension. *Journal of Extension* [On-line], *50*(5), Article 5TOT1, Retrieved from http://www.joe.org/joe/2012october/tt1.php

Flood, W. R., & Conklin, N. L. (2003). Agricultural and Extension education faculty members' use of emerging educational technologies within their instruction. *Proceedings of the 19th Annual Conference of Association of International Agricultural and Extension Education. Raleigh, NC*, 282–293.

Fraze, S., Fraze, D., Kieth, L., & Baker, M. (2002). Texas agri-science teachers' attitude toward and stage of adoption of the internet. *Journal of Southern Agricultural Education Research*, *52*(1), 62–73.

Green, S. (2012). Extension online: Utilizing technology to enhance educational outreach. *Journal of Extension* [On-line], *50*(5), Article 5TOT4, Retrieved from http://www.joe.org/joe/2012october/tt4.php

Gregg, J. A., & Irani, T. (2004). Use of information technology by county Extension agents of the Florida Cooperative Extension Service. *Journal of Extension* [On-line], *42*(3), Article 3RIB2, Retrieved from http://www.joe.org/joe/2004june/rb2.php

Kotrlik, J. W., & Redmann, D. H. (2005). Extent of technology integration in instruction by adult basic education teachers. *Adult Education Quarterly, 55*(3), 200–219. doi:10.1177/0741713605274630

Kotrlik, J. W., & Redmann, D. H. (2009). Technology adoption for use in instruction in seven career and technical education programs. *Career and Technical Education Research, 34*(1), 2009.

Kotrlik, J. W., Redmann, D. H., & Douglas, B. B. (2003). The relationship of selected teacher and program characteristics to technology adoption in agriscience education programs. *Journal of Southern Agricultural Education Research, 53*(1), 72–86.

Lokken, S. L., Cheek, W. K., & Hastings, S. W. (2003). The impact of technology training on family and consumer sciences teacher attitudes toward computers as an instructional medium. *Journal of Family and Consumer Sciences Education, 21*(1), 18–32.

Murphrey, T. P., Miller, K. A., & Roberts, T. G. (2009). Examining iPod use by Texas agricultural science and technology teachers. *Journal of Agricultural Education, 50*(4), 98–109. doi:10.5032/jae.2009.04098

O'Neill, B., Zumwalt, A., & Bechman, J. (2011). Social media use of cooperative extension family economics educators: Online survey results and implications. *Journal of Extension* [On-line], *49*(6), Article 6RIB2, Retrieved from http://www.joe.org/joe/2011december/rb2.php

Peake, J. B., Briers, G., & Murphy, T. H. (2005). Relationships between student achievement and levels of technology integration by Texas agriscience teachers. *Journal of Southern Agricultural Education Research, 55*(1), 19–32.

Peckham, J. D., & Iverson, M. J. (2000). Use of the internet in Georgia's agricultural education programs. *Journal of Southern Agricultural Education Research, 50*(1), 82–90.

Prensky, M. (2001a). Digital natives, digital immigrants. *NCB University Press, 9*(5), 1–6.

Prensky, M. (2001b). Digital natives, digital immigrants, part II: Do they really think differently? *NCB University Press, 9*(6), 1–6.

Redmann, D. H., & Kotrlik, J. W. (2004). Analysis of technology integration in the teaching-learning process in selected career and technical education programs. *Journal of Vocational Education Research, 29*(1), 3–25.

Rhoades, E., Thomas, J. R., & Davis, A. (2009). Social networking among youth: How is 4-H represented? *Journal of Extension* [On-Line], *47*(5), Article 5FEA6, Retrieved from http://www.joe.org/joe/2009october/a6.php

Rich, S. R., Komar, S., Schilling, B., Tomas, S. R., Carleo, J., & Colucci, S. J. (2011). Meeting Extension programming needs with technology: A case study of agritourism webinars. *Journal of Extension* [On-Line], *49*(6), Article 6FEA4, Retrieved from http://www.joe.org/joe/2011december/a4.php

Robideau, K., & Santl, K. (2011). Strengthening 4-H program communication through technology. *Journal of Extension* [On-Line], *49*(6), Article 6TOT2, Retrieved from http://www.joe.org/joe/2011december/tt2.php

Robinson, J. P., Shaver, P. R., & Wrightsman, L. S. (1991). Criteria for scale selection and evaluation. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.). *Measures of personality and social psychological attitudes* (pp. 1-16). New York: Academic Press.

Rogers, E. M. (2003). *Diffusion of Innovations.* New York, NY: Free Press.

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* [On-Line], *49*(1), Article 1FEA1, Retrieved from http://www.joe.org/joe/2011february/a1.php

Strong, R., & Alvis, S. (2011). Utilizing Facebook to disseminate horticultural lessons to adults. *Journal of Southern Agricultural Education Research, 61*(1), 1–12.

Van Grove, J. (2010, November 16). More than 250 million people use Facebook on a daily basis. *Mashable/Social Media*. Retrieved from http://mashable.com/2010/11/16/facebook-social/