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Extension Learners' Use of Electronic Technology

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Abstract: Extension clientele use electronic technology for entertainment, communication, and business. Educational programs that use electronic technology can enhance learning. To learn more about use of electronic technology among Extension clientele, we surveyed 80 university students and 135 potato farmers. We found that the farmers were likely to use more technology than the students were. We also found that younger people used more technology and that awareness of technology and source of news were other significant variables. One implication for Extension practitioners is that use of electronic technology by farmers should not be underestimated.

Electronic Technology as an Educational Tool

Extension clientele use electronic technology in both their professional and personal lives. Some farm families use GPS to steer tractors and video auctions to sell calves. 4-Hers who communicate with friends via Facebook might switch to text messaging to contact parents. For entertainment on a cold winter evening people can now play simulated golf on a Wii without leaving home.

New electronic technology creates opportunities and challenges for Extension educators. One challenge is to become aware of the technology that clientele are using. Although Elbert and Alston (2005) were concerned about a "digital divide" that separates those who do not have access to Internet, that divide is shrinking. Kudryavtsev, Krasny, Ferenz, and Babcock (2007) reported that computer access was no longer a problem in low-income communities. Internet concerns have shifted from access to speed to cost.

People who use electronic technology for business, communication, or entertainment may prefer to use it for learning as well. Some Extension practitioners have been using a variety of electronic tools. Kallioranta, Vlosky, and Leavengood (2006) suggested using Web-based communities to plug into electronic technology. Herring (2008) analyzed learning issues for Extension's on-line clientele. Williamson and Smoak (2005) said that Extension practitioners should develop educational packages that are "edutaining"—a term the authors coined to depict education that is entertaining.

Some educators have found ways to use electronic tools to enhance Extension programs. Olsen, Jones, Jost, and Griffin (2009) used electronic newsletters, websites, and teleconferences in farm business management programs. Case and Hino (2010) explored how to use self-produced videos for education during this era of YouTube. Bruce & Ewing (2009) studied the use of popular culture media—including movies, music and television—in Extension education. Wittman (2010) found that video gaming could be an effective tool for youth obesity programs.

Design of Study

As professors with split appointments in teaching/research/Extension, we understand the "digital native" generation that uses electronic technology for entertainment may also prefer it for learning. According to Guess (2007), 61% of university students said that electronic technology improves their learning. Rhoades, Friedel, and Irani (2008) claim students prefer classes that use new technology. Educators are also quick to use new technology. According to Kolowich (2010), 80% of professors have at least one account with Facebook, Twitter, YouTube, Skype, LinkedIn, MySpace, Flickr, Slideshare, or Google Wave and a majority use at least one as a teaching tool.

Many of our students who grew up immersed in electronic technology are also Extension clientele. Some have 4-H experience and come from farms with long histories of participation in Extension programs. During their university years, participation in Extension programs may decrease, but those who return to the farms bring their electronic technology knowledge and habits with them.

While we discussed the use of electronic technology on farms and at universities, we wondered if there were differences. We speculated that students used more electronic technology than farmers in general, but maybe that was not the case for some groups of high-tech farmers. Also, we were curious if people who read print media (e.g., book and newspapers) were less likely to use electronic technology. We looked for ways to test those ideas.

We decided to survey two groups of university students and two groups of farmers. Because we also wanted to know what types of electronic technology they were using we developed—via discussions with students, educators, and Extension clientele—a list of 21 products that were in current use for entertainment, business, and communication. Our objective was to determine which technologies the survey participants were using in 2008. Our hypotheses were as follows.

- Younger people use more electronic technology.
- Successful farmers use as much electronic technology as students.
- Choice of news source and reading for pleasure are indicators of electronic technology use.

Methods

We surveyed 215 people in four groups during February 2008 and November 2008 (Table 1). Two groups consisted of University of Idaho students. One group was enrolled in Ag Ec 289, a sophomore-level course in agricultural marketing. The other group was enrolled in Ag Ec 356, a junior-level agricultural policy course. Both classes were composed mostly of majors in the College of Agricultural & Life Sciences.

We also surveyed two groups of potato farmers who attended 2008 educational programs. One consisted of Pacific Northwest (PNW) farmers who grew potatoes for Lamb Weston, a ConAgra subsidiary that processes frozen fries. The other group consisted of PNW potato growers who were customers of Northwest Farm Credit Services, an agricultural lending cooperative. Both agricultural businesses conducted the educational programs for selected growers with whom they did business. We considered these growers to be in the "successful" category.

The average age for the university students was more than 20 years younger than the potato growers (Table 1). The spread of ages, as measured by the standard deviation, was larger in the grower groups. Females made up 42% of the students and 18% of the growers. This is a bit higher than the 14% of US farms that were operated by women in 2007 (USDA, 2007).

Table 1.
Survey Participants

Group	Month	Number	Age	
			Mean	Std Dev
Ag Ec 289	Feb-08	49	20.7	3.9
Lamb Weston	Feb-08	51	45.4	13.3
Ag Ec 356	Nov-08	31	21.6	2.7
NW Farm Credit	Nov-08	84	44.2	12.4

We asked survey participants about their awareness and use of 21 electronic technologies (Table 2). The technologies fit into one or more of three categories of use. Some, such as Apple's iPod and Nintendo's Wii, are used primarily for entertainment. Communication is the primary use for some others, such as Skype and text messaging. Technologies in the business-use category also fit into one or more of the other categories. For example, YouTube is used for entertainment, business, and communication.

Table 2.
Electronic Technology Products and Categories

Technology	Description	E	B	C
Blackberry	multi-media phone		Yes	Yes
Blue Tooth	wireless exchange device	Yes	Yes	Yes
Craigslist	free internet advertising			Yes
Digital Photo	electronic photo images	Yes	Yes	
EBay	internet auction & shopping	Yes	Yes	
Email	electronic messaging		Yes	
Facebook	social networking website	Yes		Yes

GPS	global position system	Yes	Yes	
HDTV	digital television	Yes		
i-Phone	multi-media phone			Yes
iPod	portable media player	Yes		
MP3	digital audio player	Yes		
Myspace	social networking website	Yes		Yes
Napster	file sharing service	Yes		
PDF file	document exchange device	Yes	Yes	
Skype	free internet phone service			Yes
Text messaging	cell phone typed messages			Yes
TiVo	digital video recorder	Yes		
WiFi	wireless internet signal	Yes	Yes	Yes
Wii	video game console	Yes		
YouTube	video sharing website	Yes	Yes	Yes
<i>E = Entertainment, B = Business, C = Communication</i>				

We also asked survey participants the following two questions.

1. Where do you get your news? Circle all that apply: newspaper, network TV, cable TV, radio, internet and other.
2. Have you read a book for pleasure in the last month? Yes / No

We used the answers to these two questions to test the hypothesis that choice of news source and reading for pleasure can be indicators of electronic technology use. We anticipated that those who read printed material (newspapers and books) were less likely to use electronic technologies.

We used regression analysis (ordinary least squares) to analyze survey results. Our model was:

$$U = f(A, P, K, T, G, I, N, B)$$

Where:

U = total number of the 21 technologies used by the participant

A = the participant's age

P = the participant's profession (student or farmer)

K = total number of technologies of which the participant is aware

T = time the survey was conducted (Feb 2008 or Nov 2008)

G = the gender of the participant

I = the participant's use of the internet for news

N = the participant's use of newspapers

B = participant's who read a book for pleasure in the last month

We expected a negative sign for the age coefficient. As other researchers found (Morris & Venkatesh, 2000), we thought that older people in our sample were likely to use fewer electronic technologies. We thought that variable P, the person's profession, would be statistically insignificant. That would mean that after accounting for the influence of other variables, potato farmers would be just as likely to use electronic technologies as would college students.

Although only 9 months separated the four surveys, we thought that variable T would have a positive sign. That is, as more time passes people are likely to use more electronic technologies. Because electronic technology develops rapidly, we thought that 9 months might show a difference. We expected that gender would be statistically insignificant. We also expected a positive sign for variables K and I as well as negative signs for variables N and B.

Results

Student knowledge of the technologies ranged from a low of 31% for Skype to a high of 100% for email (Table 3). Grower knowledge ranged from Skype at 47% to 14 technologies for which 100% of the respondents knew what they were. From this measure, it seems that potato growers, even though they are older, are more aware of electronic technologies than are the university students.

Table 3.
Knowledge and Use of Electronic Technology

Technology	Students		Growers	
	Know	Use	Know	Use
Blackberry	91%	15%	97%	24%
Blue Tooth	92%	32%	100%	40%
Craigslist	76%	45%	93%	60%
Digital Photo	99%	92%	100%	87%
EBay	99%	70%	100%	70%
Email	100%	97%	100%	93%
Facebook	99%	73%	100%	70%

GPS	99%	65%	100%	63%
HDTV	97%	49%	100%	47%
i-Phone	94%	66%	100%	23%
iPod	99%	71%	100%	73%
MP3	99%	63%	100%	63%
Myspace	97%	71%	100%	80%
Napster	89%	57%	90%	30%
PDF file	99%	86%	100%	77%
Skype	31%	65%	47%	20%
Text messaging	99%	94%	100%	97%
TiVo	86%	58%	90%	47%
WiFi	86%	65%	90%	63%
Wii	96%	64%	97%	63%
YouTube	97%	91%	100%	90%

Technology use shows a similar pattern. Among the students, usage ranged from 15% for Blackberry to 97% for email. Only 20% of the growers used Skype, while 93% used email. Use and Knowledge were far apart for some technologies. For example, 91% of the students knew what a Blackberry was but only 15% used it, perhaps because of the expense. On the grower side, 90% knew what Napster was but only 30% used it.

Curiously, for one technology more people used it than knew what it was. Only 31% of students knew what Skype was, but 65% used it. Perhaps some users were in group settings where someone else applied the technology and they observed but did not understand it.

The top four uses for both groups were Email, Text Messaging, Digital Photos, and YouTube. Fifth for the students was PDF file, and fifth for growers was Myspace. For some technologies there was practically no difference in knowledge or use. For example, 96% of students and 97% of growers knew what Wii was, and 64% and 63% used it.

The following five variables were included in the final regression model:

A = the participant's age

P = the participant's profession (student or farmer)

K = total number of technologies of which the participant is aware

I = the participant's use of the internet for news

B = participant's who read a book for pleasure in the last month

We did not include the three other variables because they were statistically insignificant.

Statistical results of the model are in Table 4. The 0.68 R-squared value means that the five variables explain 68% of the variation in the number of electronic technologies used by the participants.

Table 4.
Regression Results

Variable	Coefficient	T-value
Intercept	2.1	1.1
Age	-0.14	-6.4
Profession	3.3	5.1
Awareness	0.61	7.1
Internet	1.3	2.2
Book	-0.43	-1.1
R-squared = 0.68		

Discussion

Our first hypothesis that younger people use electronic technology more than older people is supported by the regression results. The coefficient of -0.14 means that for each additional year of age a participant is likely to use 0.14 fewer of the 21 electronic technologies. Because one cannot use a part of a technology, a better example would be that for each additional seven years of age participants were likely to use one less technology ($-0.14 \times 7 = -0.98$).

The second hypothesis was that farmers use electronic technology as much as college students do. For this hypothesis to be true the regression model would have had no statistical significance for the P variable. Instead, the variable is strongly significant with a coefficient of +3.5.

This means that, after accounting for participant age and the influence of the other explanatory variables, farmers use 3.5 more of the 21 technologies than students do. While this may not be true for farmers in general, the potato growers that we surveyed use more electronic technology than the University of Idaho students in the survey. Perhaps it is a matter of affordability. Potato growers might use more technology than students because they can better afford it.

It could be that other groups of farmers would be less likely to use the technologies. Because potato growing requires much capital and management expertise and many farmers recently stopped growing potatoes for financial reasons, the surviving potato farmers may use more electronic technology than other types of farmers and ranchers.

The third hypothesis was that a person's choice of news source and reading for pleasure can be indicators of electronic technology use. Our results confirmed that this hypothesis was true for our sample of participants. Those who use Internet as their source of news are likely to use 1.2 more of the technologies. Those who

have read a book for pleasure within the last month are likely to use 0.43 fewer technologies.

Apparently those who prefer to read hard copies of print on paper are less likely to use electronic technologies where images are electronic. Because Amazon's Kindle—an electronic book—was quite new in 2008, we assumed that the surveyed book readers used the print medium.

Implications for Extension practitioners include the following.

- The use of electronic technology by farmers should not be underestimated. Surprisingly, potato farmers are using more electronic technology than university students.
- Farm operations with young people involved in management are likely to use more electronic technology. Some Extension educational methods might need to be "age adjusted."
- Gender does not matter in the use of electronic technology. We found no statistically significant difference.
- Many farmers may be receptive to communication by email, websites, Facebook, Myspace, text messaging, YouTube, and other electronic means of communication. These technologies are not only for young people.
- Students and potato farmers do not differ in the level of use of electronic technology for some entertainment, such as Wii. Edutainment could be effective with audiences of all ages.
- Educational packages that use electronic technology and were developed for on-campus teaching would likely work well for potato farmers. Extension educational materials that use electronic technology could also be useful in university classrooms.

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