Application of a Three-Phase Needs Assessment Framework to Identify Priority Issue Areas for Extension Programming

Abstract

Cooperative Extension strives to deliver relevant programming to residents. However, problems facing communities are increasingly complex. We used a three-phase needs assessment to describe Utah residents' perceptions of issue areas for Extension programming. We gathered data from 1,043 Utah residents. Results highlighted four priority issue areas for Extension programming. These were environmental quality, conservation capacity, community development, and agriculture and food safety. On the basis of our work, we recommend that Extension allocate resources to addressing priority issue areas and implement a formal needs assessment framework for monitoring issue areas to inform relevant and quality programming in response to emerging needs.

Keywords: community development, Extension, priorities, programming, relevance

Lendel K. Narine
Evaluation Specialist
Utah State University
Logan, Utah
lendel.narine@usu.edu

Amanda D. Ali
Program Evaluator
Utah State University
Logan, Utah
amanda.ali@usu.edu

Paul A. Hill
Extension Professor
Utah State University
St. George, Utah
paul.hill@usu.edu

Introduction and Conceptual Framework

Cooperative Extension is well positioned to tackle emerging and persistent issues affecting communities across the United States. Because community needs change over time (Atiles & Eubanks, 2014; Lakai, Jayaratne, Moore, & Kistler, 2012), Extension professionals must stay well-informed about problems affecting residents. Understanding priority issues facing clientele helps Extension professionals create relevant and impactful programs (Reed, Swanson, & Schlutt, 2015). By identifying community issues, Extension professionals can tailor and/or create programs that directly respond to those issues (Lachapelle, Austin, & Clark, 2010; Olsen, Welch, & Perkins, 2015). Effective Extension programs are those that provide residents with the knowledge and skills to solve persistent issues and problems (Graham, Arnold, & Jayaratne, 2016). Given changing societal challenges and priorities and the importance of understanding emerging needs, we sought to apply an exploratory principal component (PCA) analysis to describe residents' perceptions of priority issues for Extension programming in Utah. Our research highlights the importance of considering residents' input to inform Extension program planning (Boyle, 1981).

Extension commonly uses community needs assessments, stakeholder input, and research findings to develop new programming to meet the needs of various target audiences (Caravella, 2006). For example, Lachapelle et al. (2010) used a community visioning process to identify issues affecting low-income residents. They found

that residents placed high value on the formal education system, a clean environment, and health care (Lachapelle et al., 2010). Some areas residents identified for improvement were economic opportunities for youths, access to affordable health care, affordable housing, and community beautification projects (Lachapelle et al., 2010). With a focus on community health, Goard and Dresbach (2003) found that personal stress, water quality, shortage of primary care physicians, and affordable health care were major areas of concern. Yang, Fetsch, McBride, and Benavente (2009) also examined a broad range of societal issues via a public opinion survey. Some issues identified related to child abuse, drug and alcohol abuse, loss of farmland, family relationships, health care costs, family finances, chronic diseases, environmental threats, and natural disasters (Yang et al., 2009). Yang et al. (2009) indicated that their assessment of public perceptions on societal issues provided ample results to help Extension educators plan and deliver relevant programs.

For our project, we used a needs assessment framework to examine Utah residents' perceptions of priority issues for Extension programming. A needs assessment is defined as "a systematic set of procedures undertaken for the purpose of setting priorities and making decisions about program improvement and allocation of resources" (Witkin & Altschuld, 1995, p. 4). Witkin and Altschuld (1995) established a needs assessment model comprising three phases: (a) preassessment (exploratory phase), (b) assessment (data collection phase), and (c) postassessment (utilization phase). In our case, the preassessment stage consisted of a synthesis of secondary data to identify issues affecting Utah communities. The assessment phase consisted of data collection and data analysis. In the postassessment phase, we established priority issues based on residents' perceptions and proposed possible solutions through targeted Extension programming. Our study demonstrates the application of a formal needs assessment framework and PCA in Extension, and our results can inform relevant Extension programming on priority issues facing a changing population.

Purpose and Objectives

The purpose of our study was to describe Utah residents' perceptions of priority issues for Extension programming. Objectives were (a) to extract and describe underlying priority issue areas based on a comprehensive list of topics addressed through Extension programming and (b) to describe residents' perceptions of the level of effort Utah State University (USU) Extension should place on addressing items in each priority issue area.

Methodology

Our research followed a correlational design (Ary, Jacobs, Sorensen, & Walker, 2014) and relied on primary data from residents of Utah. The target population was Utah residents over the age of 18. The sample size was 1,043 respondents ($n = 1,043$), and we gathered data using a convenience sampling technique. We used the raking method to weigh the sample data to reflect the target population characteristics (Cohen, 2011; Lamm & Lamm, 2019). According to Cohen (2011), the raking method is a poststratification procedure for correcting sample weights to add up to known population totals. In our study, the sample data were weighted on the basis of age, sex, and county population size, using 2018 census data to reflect the state's demographics. Therefore, sample estimates matched population parameters with respect to age, sex, and county of residence. Although the sample reflects key population characteristics, we recommend caution in generalizing the results of our study to all residents.

In the preassessment phase, we conducted a literature review of community needs assessments and reviewed secondary data sources. During this phase, we also identified the data to collect, the target audience, and

appropriate data collection methods. First, we reviewed several needs assessments conducted by University of Wisconsin–Extension, University of Florida Extension, and North Carolina State University Extension. This review provided a list of priority needs relevant to Extension programming in other states. With awareness of priority issues in other states, we focused our preassessment on issues in Utah. We reviewed secondary data sources, including reports by governmental and nongovernmental organizations, such as the Utah Department of Health, the Utah Foundation, and Utah Community Action. The review provided us with a detailed list of problem and issue areas within the scope of Extension programming. Next, we collaborated with Utah Extension directors and county faculty to review relevant and emerging state-specific problems. As a result, the preassessment phase guided questionnaire development.

The preassessment phase led to a draft survey instrument. In the assessment phase, we collected data using Qualtrics, after the study was deemed exempt by USU Institutional Review Board. We used a closed-ended questionnaire to gather data from the sample. Construct and content validity were examined by a panel of experts that included two Extension regional directors, the state director of 4-H and youth programs, and two Extension specialists at USU Extension. Questionnaire development followed Dillman, Smyth, and Christian's (2014) discussion on the basics of crafting good questions and constructing closed-ended questions. Data were collected in June 2019.

Respondents were presented with 32 items in the final questionnaire, each dealing with a specific issue of focus in Extension programming. They were asked to indicate their perception of how much effort USU Extension should spend on each issue, using a 5-point Likert-type scale. The scale was coded as follows: 1 = *no effort*, 2 = *low effort*, 3 = *moderate effort*, 4 = *high effort*, and 5 = *very high effort*. A point score (PS) based on an item's frequency distribution was calculated for each issue item. This approach allowed for direct comparison and ranking of individual issue items. Therefore, the PS represented a modified index of net difference between items (Lieberson, 1976). The PS was calculated as follows: PS = [(1 * % no effort) + (2 * % low effort) + (3 * % moderate effort) + (4 * % high effort) + (5 * % very high effort) / 100]. Consistent with the original Likert-scale, the PS ranged from 1 to 5 and was interpreted as follows: 1.00–1.49 = *no effort*, 1.50–2.49 = *low effort*, 2.50–3.49 = *moderate effort*, 3.50–4.49 = *high effort*, and 4.50–5.00 = *very high effort*. Interpretation of the ordinal 5-point scale is consistent with the literature (Franklin, 2011; Scales, Terry, & Torres, 2009).

For Objective A, we analyzed data using a PCA with an orthogonal rotation. We used the PCA to reduce the original list of issue items into latent factors (Warner, 2013), referred to as priority issue areas. We used the point of inflection from the scree plot to determine the number of factors for extraction (Warner, 2013). Therefore, each priority issue area comprised highly correlated individual issues. In this regard, a priority issue area represented a major programmatic area for Extension according to residents' perceptions of where Extension should place programming efforts. For Objective B, we identified descriptive frequencies and a PS for each issue item; this tactic allowed for direct comparison and ranking between individual items. Priority issue areas were ranked according to their overall means.

Findings

Objective A: Extraction of Priority Issue Areas

With respect to Objective A, Table 1 at the end of this section shows findings of the PCA. All issue items were included in the PCA, and underlying components were referred to as priority issue areas. A closer examination of the factor loadings revealed four broad priority issue areas; these were labeled as community development (or CD), conservation capacity (or CC), agriculture and food safety (or AS), and environmental quality (or EQ). The four priority issue areas accounted for 60% of the variance in the original items. Further, the PCA model met all pertinent assumptions as the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.945 and the Bartlett's test of sphericity had a statistically significant chi-square value (X^2 = 21472.57, p < .001). Further, we determined that all priority issue areas had acceptable internal consistency on the basis of the Cronbach's alpha for each (Warner, 2013): CD = 0.95, CC = 0.85, AS = 0.77, and EQ = 0.79.

As shown in Table 1, the four priority issue areas each comprised specific issue items either directly or indirectly addressed through Extension programming. The priority issue area of community development included many items surrounding youth development, mental and physical well-being, healthful living, financial well-being, and healthful relationships. Although all items of this issue area were loaded onto one construct in the PCA, the issue area essentially covers a wide spectrum of societal issues. Therefore, related Extension programs may include 4-H and programs within the scope of family and consumer sciences. Another priority issue area uncovered by the PCA was conservation capacity, which can be viewed as efforts targeting environmental sustainability. This issue area related to measures for conserving natural habitats, recycling, effective land use, and household water and energy conservation. Although "building the capacity of nonprofits and community leaders" can relate to all priority issue areas, the highest loading for this item was associated with conservation capacity. Extension programs related to conservation capacity may include those addressing proper landscape irrigation techniques and wetland management initiatives. The PCA revealed that agriculture and food safety was another major priority issue area. Items in this area related to helping farmers improve productivity and profitability, strengthening local food systems, and ensuring food safety to prevent foodborne illnesses. The priority issue area of environmental quality referred to efforts to protect air and water quality. For example, programs dealing with fertilizer runoffs, idle-free zones, and congestion zones are Extension efforts intended to improve water and air quality.

Table 1.

Priority Issue Areas Extracted from the Principal Component Analysis

Priority issue area	Item	Loading			
		CD	CC	AS	EQ
Community development (CD)	Youth mental health and teen suicide prevention	0.72	0.11	−0.03	0.39
	Ensuring individuals have access to affordable healthy food	0.52	0.25	0.20	0.38
	Addressing food and hunger issues	0.53	0.37	0.09	0.34
	Tackling the opioid crisis	0.72	0.15	−0.01	0.29
	Chronic disease prevention	0.63	0.22	0.17	0.28

	Addressing prescription drug abuse through education	0.75	0.21	−0.03	0.27
	Helping communities be better prepared for natural disasters	0.47	0.36	0.27	0.23
	Reducing obesity through educational programs	0.54	0.35	0.18	0.23
	Providing physical fitness education	0.65	0.34	0.12	0.18
	Preventing drug and/or alcohol abuse	0.80	0.10	0.05	0.16
	Helping consumers make healthy food choices	0.52	0.46	0.26	0.14
	Helping youth develop leadership, citizenship, and life skills	0.59	0.19	0.26	0.11
	Strengthening workforce readiness and entrepreneurship	0.60	0.31	0.09	0.05
	Teaching healthy relationship skills to teens	0.77	0.12	0.16	0.04
	Helping first-time homeowners make smart financial decisions	0.66	0.32	0.15	−0.03
	Building resilient communities through collaborative efforts	0.53	0.50	0.19	−0.04
	Strengthening couple and/or marital relationships	0.79	0.09	0.24	−0.15
	Building healthy and strong families	0.75	0.10	0.30	−0.19
Conservation capacity (CC)	Preserving natural ecosystems and habitats	0.09	0.61	0.11	0.48
	Composting, reusing and recycling consumer goods	0.18	0.78	0.09	0.17
	Helping households reduce water use	0.25	0.76	0.09	0.13
	Helping households become more energy efficient	0.41	0.57	0.14	0.12
	Managing and protecting rangelands	0.07	0.59	0.38	0.12
	Building the capacity of nonprofits and community leaders	0.46	0.57	0.14	0.03
	Assisting local government and businesses with land use decisions	0.19	0.49	0.45	0.01
Agriculture and food safety (AS)	Ensuring safe food handling practices to prevent foodborne illness	0.36	0.04	0.46	0.45
	Preserving agricultural farmland	0.04	0.10	0.70	0.31
	Strengthening the local food system	0.18	0.25	0.70	0.24
	Assisting farmers in agricultural production and profitability	0.15	0.16	0.81	0.08
	Home food safety practices, food preservation, and canning	0.43	0.36	0.47	−0.16
Environmental quality (EQ)	Protecting air quality	0.19	0.17	0.13	0.75
	Protecting water quality	0.05	0.15	0.33	0.75

Objective B: Description of Priority Issue Areas

Table 2 at the end of this section shows our results related to our second objective. The most important priority issue area was environmental quality (M = 4.29, SD = 0.74), followed by conservation capacity (M = 3.80, SD = 0.66), community development (M = 3.72, SD = 0.74), and agriculture and food safety (M = 3.56, SD = 0.71). Although residents perceived that Extension should place a higher level of effort on programming related to environmental quality, all priority issue areas had an overall mean score of 3.50–4.49. This result indicated that residents of Utah believe Extension should spend at least high effort on all priority issue areas.

Within the priority issue area of environmental quality, residents generally perceived that Extension should place high effort on programming to protect both water quality (PS = 4.31) and air quality (PS = 4.28). A closer examination of the descriptive statistics showed that about 46% of residents perceived that Extension should place very high effort on protecting water quality, and most (51%) perceived that Extension should place very high effort on protecting air quality. Overall, protecting water quality and air quality were rated as the highest priorities for Extension programming compared to all other items of other priority issue areas.

For conservation capacity, residents generally perceived that Extension should place high effort on programming related to preserving natural ecosystems and habitats (PS = 3.98), composting and reusing and recycling consumer goods (PS = 3.68), managing and protecting rangelands (PS = 3.61), and helping households become more energy efficient (PS = 3.58). According to the descriptive statistics of issue items within conservation capacity, about 34% of respondents perceived that Extension should place very high effort on programming to preserve natural ecosystems and habitats, 24% perceived that Extension should place very high effort on composting and reusing and recycling consumer goods, 20% perceived that Extension should place very high effort on helping households become more energy efficient, and 18% perceived that Extension should place very high effort on managing and protecting rangelands.

Many items exhibited high PCA loadings in the community development issue area. Yet according to the descriptive analysis, residents of Utah perceived that Extension should place high effort on 14 of the 18 items within this priority issue area. An assessment of the PSs shows that the top five items were addressing youth mental health and preventing teen suicide (PS = 4.16), ensuring that individuals have access to affordable healthful food (PS = 3.98), addressing food and hunger issues (PS = 3.85), helping youths develop leadership, citizenship, and life skills (PS = 3.82), and helping communities be better prepared for natural disasters (PS = 3.78). Notably, half of the sample (50%) believed Extension should place a very high level of effort on youth mental health and teen suicide prevention. Overall, this item was rated as the third most important priority, behind only protecting water quality and protecting air quality in the priority issue area of environmental quality.

Although it was rated overall as a high priority, agriculture and food safety ranked as the fourth among the four priority issue areas for Extension programming. Residents generally perceived that Extension should place high effort on programming related to ensuring safe food handling practices to prevent foodborne illness (PS = 4.08), strengthening the local food system (PS = 3.88), preserving agricultural farmland (PS = 3.78), and assisting farmers in agricultural production and profitability (PS = 3.74). A closer examination of the descriptive results indicated that 36% of respondents believed Extension should place very high effort on ensuring safe food handling practices to prevent foodborne illness, 26% believed Extension should place very high effort on strengthening the local food system, 20% believed Extension should place very high effort on

preserving agricultural farmland, and 21% believed Extension should place very high effort on assisting farmers in agricultural production and profitability.

Table 2.

Description of Items Loaded onto Each Priority Issue Area

Item	%					PS
	NE	LE	ME	HE	VE	
Protecting water quality	1	1	11	42	46	4.31
Protecting air quality	1	4	13	32	51	4.28
Environmental quality						4.29 (.74)
Preserving natural ecosystems and habitats	1	3	25	37	34	3.98
Composting, reusing and recycling consumer goods	2	9	32	33	24	3.68
Managing and protecting rangelands	2	8	36	36	18	3.61
Helping households become more energy efficient	2	9	38	32	20	3.58
Helping households reduce water use	3	11	36	31	18	3.49
Assisting local government and businesses with land use decisions	3	12	38	35	13	3.43
Building the capacity of nonprofits and community leaders	4	18	44	24	10	3.17
Conservation capacity						3.80 (.66)
Youth mental health and teen suicide prevention	3	5	15	28	50	4.16
Ensuring individuals have access to affordable healthy food	1	4	23	39	33	3.98
Addressing food and hunger issues	1	6	27	38	28	3.85
Helping youth develop leadership, citizenship, and life skills	2	6	27	38	27	3.82
Helping communities be better prepared for natural disasters	1	6	31	40	23	3.78
Teaching healthy relationship skills to teens	3	8	27	35	27	3.75
Chronic disease prevention	2	8	28	37	25	3.74

	NE	LE	ME	HE	VE	PS
Preventing drug and/or alcohol abuse	5	11	26	29	30	3.68
Strengthening workforce readiness and entrepreneurship	3	8	32	35	22	3.66
Addressing prescription drug abuse through education	4	10	30	31	25	3.63
Tackling the opioid crisis	5	13	27	26	28	3.60
Building healthy and strong families	4	10	29	37	20	3.58
Reducing obesity through educational programs	3	10	36	31	20	3.54
Helping consumers make healthy food choices	3	11	35	35	17	3.50
Providing physical fitness education	4	13	36	29	17	3.44
Building resilient communities through collaborative efforts	3	12	42	30	13	3.39
Strengthening couple and/or marital relationships	7	14	32	27	20	3.38
Helping first-time homeowners make smart financial decisions	6	17	36	25	16	3.29
Community development						3.72 (.74)
Ensuring safe food handling practices to prevent foodborne illness	1	4	20	40	36	4.08
Strengthening the local food system	1	4	27	42	26	3.88
Preserving agricultural farmland	1	4	32	44	20	3.78
Assisting farmers in agricultural production and profitability	1	6	32	40	21	3.74
Teaching home food safety practices, food preservation, and canning	4	14	38	29	15	3.38
Agriculture and food safety						3.56 (.71)

Note. NE = no effort, LE = low effort, ME = moderate effort, HE = high effort, VE = very high effort. PS = point score.

Conclusions, Recommendations, and Implications

We sought to assess residents' perceptions of critical issues for Extension programming in Utah. Guided by Witkin and Altschuld's (1995) needs assessment framework, we (a) developed a list of community issues in the preassessment phase using secondary data sources, (b) collected primary data from residents and analyzed the data in the assessment phase, and (c) identified priority issues for Extension programming in the

postassessment phase. Our findings revealed four priority issue areas. These were environmental quality, conservation capacity, community development, and agriculture and food safety. Within each of these priority issue areas, Utah residents perceived that Extension should place the highest emphasis, respectively, on protecting water quality, preserving natural ecosystems and habitats, addressing youth mental health and preventing teen suicide, and ensuring safe food handling practices to prevent foodborne illness.

Our findings were similar to those of Yang et al. (2009) in Colorado. However, whereas residents of Utah placed highest emphasis on water quality compared to other issues, residents of Colorado placed highest priority on helping vulnerable children and youths. Still, in our study addressing youth mental health and preventing teen suicide was rated as the most important issue within community development and the second most important issue overall. Like those of Goard and Dresbach (2003) and Lachapelle et al. (2010), our findings also indicate that residents perceived that a high level of effort should be place on health issues such as drug abuse, chronic diseases, and sustainable food systems.

The similarities between our results and earlier studies indicate some consistency in residents' perceptions of critical issues and point to underlying needs. Our findings allude to an opportunity for Extension in Utah to address persistent needs related to environmental and natural resources conservation, mental health and personal wellness, family relationships, affordable and healthful food, and sustainable agricultural systems. In recent years, USU Extension has implemented several programs aligned with the societal issues highlighted in our study. For example, Utah Water Watch provides educational workshops for volunteers who monitor biological activity in major water bodies, and several pilot programs focusing on drug abuse and mental wellness have been implemented. This situation indicates the responsiveness of Extension to issues affecting residents.

The three-phase needs assessment framework we applied effectively guided our study. Extension relies on community needs assessment to create and deliver relevant programs to audiences; our study exemplifies a practical quantitative methodology that can be used to assess priority issues for Extension programming. Guided by Witkin and Altschuld's (1995) needs assessment framework, in the assessment phase, we used a state-specific survey instrument to gather relevant data from target audiences. The instrument consisted of questions asking about participants' perceptions of many social, economic, and environmental issues within the scope of Extension programming. These issues were identified on the basis of a review of secondary data as well as key input from Extension directors and county faculty. Our application of PCA, descriptive statistics, and the PS method provided a quantitative basis for a robust discussion of priority issue areas. Yang et al. (2009) also applied the PCA and revealed six underlying constructs based on residents' perceptions of priority issues. However, other methods, such as the qualitative community visioning process discussed by Lachapelle et al. (2010), can add depth to the quantitative approach in understanding community needs.

Our study holds implications for Cooperative Extension as it provides a framework for quantitatively incorporating residents' input in program planning. Extension educators can develop a list of issues by scanning secondary data in their respective states and then create an instrument for gathering primary data from residents. Our method is useful in reducing a lengthy list of items into constructs; priority issue areas can be viewed as themes for Extension programming, and individual items can inform goals and objectives of individual programs. Our study supports the ongoing attempt by Extension professionals to identify and target key issues affecting residents. Identifying key issues and problems affecting residents helps Extension professionals create and implement targeted educational programming to meet the needs of different

audiences.

We recommend that Extension professionals and administrators periodically assess community issues when making decisions regarding resource allocation. Further, administrators could establish internal grants to award funding for program proposals that focus on priority issue areas. Extension professionals can assess community issues when brainstorming program ideas and create working groups to address specific issues. Although societal issues change over time, our findings suggest that there are persistent issues that can be addressed through existing Extension programming. Therefore, Extension professionals can use secondary data to inform and modify ongoing programs. In addition, they can engage with audiences to identify emerging issues to create new programs. With input from stakeholders and residents, Extension can be a leader in providing educational programs to address urgent community needs. This ultimately fosters Extension programs that support capacity building and community development.

References

Ary, D., Jacobs, L. C., Sorenson, C., & Walker, D. A. (2014). *Introduction to research in education* (9th ed.). Belmont, CA: Wadsworth.

Atiles, J. H., & Eubanks, G. E. (2014). Family and consumer sciences and Cooperative Extension in a diverse world. *Journal of Extension*, *52*(3), Article v52-3comm1. Available at: https://joe.org/joe/2014june/comm1.php

Boyle, P. G. (1981). *Planning better programs*. New York, NY: McGraw-Hill.

Caravella, J. (2006). A needs assessment method for Extension educators. *Journal of Extension*, *44*(1), Article 1TOT2. Available at: https://www.joe.org/joe/2006february/tt2.php

Cohen, M. P. (2011). Raking. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods* (pp. 672–673). Thousand Oaks, CA: Sage. doi:10.4135/9781412963947

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail and mixed-mode surveys: The tailored design method* (4th ed.). Hoboken, NJ: John Wiley & Sons.

Franklin, E. A. (2011). Greenhouse facility management experts identification of competencies and teaching methods to support secondary agricultural education instructors: A modified Delphi study. *Journal of Agricultural Education*, *52*(4), 150–161. doi:10.5032/jae.2011.04150

Goard, L. M., & Dresbach, S. H. (2003). Community health as community partnerships. *Journal of Extension*, *41*(3), Article 3IAW3. Available at: https://www.joe.org/joe/2003june/iw3.php

Graham, D. L., Arnold, S., & Jayaratne, K. S. U. (2016). Research priority 6: Vibrant, resilient communities. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds.), *American Association for Agricultural Education national research agenda: 2016–2020* (pp. 1–66). Gainesville, FL: Department of Agricultural Education and Communication.

Lachapelle, P., Austin, E., & Clark, D. (2010). Community strategic visioning as a method to define and address poverty: An analysis from select rural Montana communities. *Journal of Extension*, *48*(1), Article v48-1a1. Available at: https://joe.org/joe/2010february/a1.php

Lakai, D., Jayaratne, K. S. U., Moore, G. E., & Kistler, M. J. (2012). Barriers and effective educational strategies to develop Extension agents' professional competencies. *Journal of Extension*, *50*(4), Article v50-4rb1. Available at: https://joe.org/joe/2012august/rb1.php

Lamm, A. J., & Lamm, K. W. (2019). Using non-probability sampling methods in agricultural and extension education research. *Journal of International Agricultural and Extension Education*, *26*(1), 52–59. doi:10.5191/jiaee.2019.26105

Lieberson, S. (1976). Rank-sum comparisons between groups. *Sociological Methodology*, *7*(1976), 276–291. doi:10.2307/270713

Olsen, J. R., Welsh, J. A., & Perkins, D. F. (2015). Evidence-based programming within Cooperative Extension: How can we maintain program fidelity while adapting to meet local needs? *Journal of Extension*, *53*(3), Article v53-3a3. Available at: https://www.joe.org/joe/2015june/a3.php

Reed, A. S., Swanson, L., & Schlutt, F. (2015). Timberline manifesto: Seven concepts linking Extension and engagement. *Journal of Extension*, *53*(4), Article v53-4comm1. Available at: https://www.joe.org/joe/2015august/comm1.php

Scales, J., Terry, R., & Torres, R. M. (2009). Are teachers ready to integrate science concepts into secondary agriculture programs? *Journal of Agricultural Education*, *50*(2), 100–111. doi:10.5032/jae.2009.02100

Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques* (2nd ed.). Thousand Oaks, CA: Sage.

Witkin, B. R., & Altschuld, J. W. (1995). *Planning and conducting needs assessments: A practical guide*. Thousand Oaks, CA: Sage Publications.

Yang, R. K., Fetsch, R. J., McBride, T. M., & Benavente, J. C. (2009). Assessing public opinion directly to keep current with changing community needs. *Journal of Extension*, *47*(3), Article v47-3a6. Available at: https://www.joe.org/joe/2009june/a6.php