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Dave Smaldone

West Virginia University, david.smaldone@mail.wvu.edu

Deborah A. Boone

West Virginia University, debby.boone@mail.wvu.edu

Steve Selin

West Virginia University, Steve.Selin@mail.wvu.edu

Amanda See

West Virginia State University, aswecker@mix.wvu.edu



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Broadening Extension's Capacity—Comparing Extension Agents' and Environmental Educators' Perceptions of Needs and Barriers

Dave Smaldone

Associate Professor

Division of Forestry & Natural Resources

David.Smaldone@mail.wvu.edu

Deborah A. Boone

Associate Professor

Agricultural and Extension Education, Division of Resource Management

Debby.Boone@mail.wvu.edu

Steve Selin

Professor

Division of Forestry & Natural Resources

Steve.Selin@mail.wvu.edu

Amanda See

Graduate Student

aswecker@mix.wvu.edu

West Virginia University

Morgantown, West Virginia

Abstract: Conservation and environmental education share similar goals with Extension and thus holds partnership potential for Extension. The study reported here compared the needs and barriers faced by environmental educators and Extension agents in West Virginia using a mail survey. Results indicated there were both similarities and differences in the needs and barriers of the two groups. It was also noted that EE groups and Extension agents were unaware of each other's programs and did not view each other as important sources of information. This represents an opportunity for the groups to network and connect in new ways.

Introduction

In recent years, the relevance and mission of Extension have been increasingly debated as shifting demographics and rapidly evolving technologies have reshaped traditional audiences (Bull, Cote, Warner, & McKinnie, 2004; West, Drake, & Londo, 2009). One potential way to maintain relevance, broaden audiences, and create new partnerships is to reach out to conservation and environmental education groups.

The success of Master Gardener programs and the recent growth of Master Naturalist programs reveals that by addressing the broader topic of conservation education, the capacity of Extension may be increased (Main, 2004; Savanick, & Blair, 2005).

Over the past decade, Extension has expanded its programming focus in the environmental education area. This has been particularly true with respect to 4-H programs and partnering with K-12 public schools (Phibbs, Relf, & Hunnings, 2005). This transition has occurred at both a grassroots level and a more strategic, national level. From 1996 to 1998, Extension and the US Environmental Protection Agency (EPA) partnered to develop a national strategy for supporting community-based environmental education (EPA, 1998). Within Extension, some have called for expanding these types of opportunities to address Natural Resources and Environmental Management Education (Fridgen, 1995) as well as Sustainable Living Education (Elliott et al., 2008). Therefore, reaching out to other natural resource, conservation, and environmental education groups could further benefit Extension.

Environmental Education and Extension

The North American Association for Environmental Education (NAAEE) believes the purpose of environmental education (EE) is to teach people how to think about the environment, not what to think, through a positive, non-confrontational approach <www.naaee.org, 2009>. The EPA states that environmental education does not advocate a particular viewpoint or course of action (U.S. EPA, 2007). Environmental education provides people with the capability and skills over time to analyze environmental issues, engage in problem solving, and take action to sustain and improve the environment.

Recent focus on national concerns about our decreased connection to nature and the environment, decreasing physical activity levels coupled with increasing obesity rates (especially in children), and climate change has brought new attention to environmental programs and education. The National Environmental Education Foundation, which teams up with schools and other institutions to promote green curricula, has seen its number of partners jump from 330 in 2006 to 1,855 in 2008 (King, 2008).

Observed benefits of environmental education programs for children include better performance on standardized measures of academic achievement in reading, writing, mathematics, and social studies; reduced discipline and classroom management problems; and increased engagement and enthusiasm for learning (Lieberman & Hoody, 1998). Not only do programs benefit children, they can be very beneficial to adults as well. In order to develop effective programs it is very important that educators have the most accurate, current, and user-friendly resources readily accessible.

The purpose of the study reported here was to determine the needs of West Virginia Environmental Education Association (WVEEA) members and Extension agents with regard to environmental education and to assess potential for collaboration between WVEEA members and the West Virginia University Extension Service. According to Caravella (2006), a needs assessment can help identify: 1) needs as well as expectations and preferences; 2) reliable, effective, and appropriate methods to find information; and 3) ways of building what is learned into strategic planning and service development.

A needs assessment can be a crucial step in capacity building for organizations like the WVEEA and Extension. Extension agents are trained professionals who have the responsibility to help improve the quality of life for individuals and families through education. Because environmental issues are complex, many audiences—farmers, local governmental officials, environmental organizations, and concerned citizens—have questions about rapidly changing environmental policies. Extension's mission includes providing timely, issues-oriented policy education programs. Historically, Extension focused on disciplinary programming providing subject matter technical expertise. However, Extension's role has expanded over

time to include issues programming, to provide information on issues of wide public concern that go beyond traditional agricultural audiences and include environmental issues. Although Extension is already involved in environmental education programs such as youth horticulture, Master Gardeners, and Master Naturalists, the opportunity exists to expand partnerships and audiences.

Methods

The study reported here sought to determine barriers and needs of WVEEA and Extension professionals to aid in developing professional development opportunities and collaborations. County Extension agents were also surveyed regarding their awareness of and roles in environmental education programs in their counties.

Two slightly different mail surveys were used to collect data from both groups during August and September 2008. The surveys for each group were different, but included some of the same questions regarding professional development needs and barriers. Many of the questions included in the survey were adapted from a similar study done in Alberta, Canada (ACEE, 2006). The WVEEA survey (consisting of 27 questions) was mailed to all their contacts, which were obtained from the existing WVEEA database and included environmental educators from organizations, government agencies, and schools across the state. The WVEEA survey was pilot tested using the seven-person Board of Directors of WVEEA, and a few minor revisions were made based on their input. Mailed surveys (consisting of 11 questions) were also sent to agents in all 55 WV County Extension offices. Questionnaires were mailed to all participants accompanied by a cover letter that stated the objectives of the survey. Using a modified Total Design method (Dillman, 2007), after 10 days an email reminder was sent. Two weeks following that reminder, another email reminder and another hard copy of the survey were sent to those who had not yet returned the survey. No non-response bias analysis was done with either group.

Results

Of the 92 surveys sent to contacts associated with WVEEA, 46 were returned, giving a 50% response rate. The mean age of the respondents was 44 years of age, and 63% were female. The majority of respondents were Caucasian (91%), and many had completed a graduate degree (44%). Of the 102 surveys mailed to Extension agents in West Virginia, 41 were returned, giving a 40% response rate. The mean age of the respondents was 44 years of age, and 56% were female. A majority of the respondents were Caucasian (97%) and had completed a graduate degree (95%).

Extension Agents' Knowledge of Environmental Education Programs

Of the Extension agents who responded to the survey, 63% were aware of environmental education programs in their respective counties. When asked to list EE programs they were aware of, the most commonly reported programs were farm related (50%), recycling (46%), 4-H programs and camps (35%), and farm horticulture programs (15%). Of the respondents, 67% indicated their county Extension offices do provide materials for these programs. When asked to list the sources of EE materials they provide, the most common answers were WVU Extension Service (50%), the Department of Agriculture (23%), and the Internet (15%), while only 8% reported getting information from conservation groups.

Description of the Environmental Education Organizations

The WVEEA respondents were mostly associated with a non-profit organization (44%), a government agency (33%), or a university or college (11%). Some of the most commonly mentioned environmental issues/topics that the respondents' programs addressed were water quality (85%), ecosystems (62%), plant

life (57%), and wildlife (57%). There were a few "other" topics that several respondents wrote in, including forestry and other general environmental issues.

The most common type of environmental education programs offered by respondents included school programs (72%), special events (70%), children's programs (57%), and adult programs (55%). Fifty-five percent of respondents conducted teacher trainings. Seventy-two percent of the respondents said their programs are conducted year round, while only 11% were conducted seasonally. The most commonly addressed West Virginia school curriculum included junior high science (70%), elementary science (61%), and high school biology (54%).

The WVEEA respondents were given a list of sources of information and asked to rank how important each was for their organization (Extension agents were not asked this same question—they were asked more open-ended questions regarding knowledge of EE programs and sources of information, as noted above). Each source of information was ranked on a scale of 0-3, where 0 = "not important" and 3 = "very important." The sources that were most frequently indicated as "very important" or "important" were "personal contact with experts" (100%), "training workshops" (91%), "attending conferences" (87%), and "network meetings with colleagues" (86%) (Table 1). Sources of information that were most frequently reported as being "a little important" or "not important" were "County Extension Service & Agents" (62%), "paper newsletters" (63%), and "web or video conferencing" (59%).

Table 1.
Environmental Education Organization's Sources of Information

Information Sources (by percentage, N=45)	Very Important	Important	A Little Important	Not Important
Attending conferences	36	51	11	2
Training workshops	40	51	7	2
Email list serves	24	49	27	0
Electronic newsletters	18	53	29	0
Paper newsletters	9	28	49	14
County Extension Service & Agents	7	31	50	12
Conducting internet research	38	31	24	7
Scientific studies and/or research	46	32	18	5
Mainstream print	4	49	33	13
Electronic media (web pages; blogs, etc.)	30	50	18	2
Specialty newsletters and periodicals	21	33	36	10
	52	48	0	0

Personal contact with experts				
Web or video conferencing	14	27	50	9
Telephone conferencing	11	52	23	14
Network meetings with colleagues	43	43	11	2

Barriers to Environmental Education—A Comparison

Environmental education providers and Extension agents were given a list of barriers that they may have encountered in their environmental education work (Table 2). They indicated significance on a scale of 0-3, where 0 = "Not Significant" and 3 = "Very Significant." These four categories were collapsed into two for analysis—"Not significant" and "A little significant" were combined, and "Significant" and "Very Significant" were combined.

The barriers reported as most significant by both environmental education providers and Extension agents were:

1. Escalating busing costs,
2. Teachers lack of time to fully participate in programs, and
3. Lack of funding for programs.

Extension agents also noted lack of time to plan, develop, or update programs and teachers lacking interest as major barriers.

The barriers identified as least significant by both environmental education providers and Extension agents were:

1. Lack of support within their organization,
2. Difficulty keeping staff,
3. Lack of relevant professional development for staff, and
4. Staff burnout

Environmental educators also reported lack of curriculum fit as a least significant barrier.

Table 2.
Significance of Barriers to Conducting Environmental Education

N=44 (WVEEA) N=36 (Extension)	Very Significant or Significant (percentage)		A Little or Not Significant (percentage)	
	WVEEA	Ext.	WVEEA	Ext.
Difficulty contacting and or engaging new audiences	33	60	67	40
Teachers lack time to fully participate in programs	70	86	30	14
Teachers lack interest to fully participate in programs	45	78	55	22
Inadequate background knowledge by teachers	38	57	62	43
Concerns over liability vis-à-vis outdoor programs	24	49	76	51
Escalating busing costs means fewer site visits	74	77	26	23
Lack of time to plan, develop or update programs	42	83	58	17
Lack of evaluation tools to measure effectiveness and improve programs	37	54	63	46
Partnership creation takes time and is difficult	47	66	53	34
Lack of curriculum fit	16	53	84	47
Difficulty keeping staff	19	30	81	70
Lack of relevant professional development for staff	16	49	84	51
Don't hear about professional development opportunities	26	64	74	36
Lack of funding for programs	61	83	39	17
Lack of funding for core operations	58	70	42	30
Don't know what other organizations are up to	42	66	58	34
Inadequate understanding of new technology	25	54	75	46
Lack of support within my organization	7	26	93	74
Low demand from key audiences	30	65	70	35
Staff burnout	21	50	79	50
Volunteer burnout	26	71	74	29

In addition, Mann-Whitney U-tests were used to compare the differences between reported barriers for the two groups (WVEEA and Extension). Results revealed only four barriers were NOT statistically significant between the groups: "teachers lack time to fully participate," "inadequate background knowledge by teachers," "escalating busing costs means fewer site visits," and "lack of funding for core operations." Interestingly, for all statistically significant results (and non-significant results, too), Extension agents ranked the barriers as more significant (i.e., higher).

Table 3.
Mann-Whitney U Tests Comparing Barriers Between Groups

N=44 (WVEEA) N=36 (Extension)	WVEEA Mean rank	Extension Mean rank	Z score	Sig.
Difficulty contacting and or engaging new audiences	33.58	45.5	-2.463	.014*
Teachers lack time to fully participate in programs	36.76	43.88	-1.465	.143
Teachers lack interest to fully participate in programs	33	47.08	-2.891	.004*
Inadequate background knowledge by teachers	35.54	43.16	-1.554	.120
Concerns over liability vis-à-vis outdoor programs	33	46.20	-2.728	.006*
Escalating busing costs means fewer site visits	37.91	41.46	-.731	.465
Lack of time to plan, develop or update programs	29.63	51.63	-4.461	<.001*
Lack of evaluation tools to measure effectiveness and improve programs	35.10	44.90	-2.028	.043*
Partnership creation takes time and is difficult	34.74	45.34	-2.199	.028*
Lack of curriculum fit	29.34	52.74	-4.745	<.001*
Difficulty keeping staff	34.14	44.18	-2.122	.034*
Lack of relevant professional development for staff	32.58	49.33	-3.390	.001*
Don't hear about professional	29.98	50.61	-4.165	<.001*

development opportunities				
Lack of funding for programs	36.07	45.92	-1.991	.047
Lack of funding for core operations	35.97	41.80	-1.197	.231
Don't know what other organizations are up to	32.87	47.64	-3.060	.002*
Inadequate understanding of new technology	32.83	49.01	-3.297	.001*
Lack of support within my organization	34.26	45.94	-2.462	.014*
Low demand from key audiences	31.62	48.34	-3.479	.001*
Staff burnout	33.55	47.12	-2.766	.006*
Volunteer burnout	29.85	49.19	-3.924	<.001*
*Significant difference at p<.05				

Comparing Professional Development Needs

Both groups were provided a list of topics for potential professional development opportunities/needs (Table 3). They were asked to indicate how valuable the topic would be on a scale of 0-3, with 0 equal to "Not Valuable" and 3 equal to "Very Valuable." These categories were also collapsed into two for analysis—"Not valuable" and "A little valuable" were combined, and "Valuable" and "Very valuable" were combined.

The top professional development needs identified by environmental education providers were:

1. How to maximize environmentally responsible behavior,
2. How to reach and broaden your audience, and
3. How to design teaching resources.

Development needs ranked the lowest by environmental educators were:

1. How to find current research on environmental issues and

2. How to maintain a successful outdoor education program.

The top professional development needs of Extension agents were:

1. How to maintain a successful outdoor education program,
2. How to improve programs based on current environmental education research, and
3. How to reach and broaden your audience.

It is significant to note that over 75% of the Extension agents indicated all development needs were "Valuable" or "Very valuable", except one: NAAEE guidelines for excellence in environmental education.

Table 4.
Value of Professional Development Needs

N=45 (WVEEA) N=38 (Ext.)	Very Valuable or Valuable (percentage)		Little or Not Valuable (percentage)	
	WVEEA	Ext.	WVEEA	Ext.
How to improve your program, based on current EE research	67	89	33	11
How to maximize environmentally responsible behavior	81	81	19	19
How to evaluate	73	78	27	22
The NAAEE guidelines for excellence in environmental education	73	62	23	38
How to engage youths	67	81	33	19
How to maintain a successful outdoor education program	65	92	35	8
Curriculum review	71	81	29	19
How to deliver effective teacher training workshops	67	78	33	22
How to design teaching resources (i.e., activity book, multi-media, etc.)	75	76	25	24
How to reach and broaden your audience	76	84	24	16
How to find current research on environmental issues	62	76	38	24

Mann-Whitney U-tests were used to compare the differences between reported professional development needs for the two groups (WVEEA and Extension). Results revealed only two statistically significant differences between the groups: "how to engage youths" and "how to maintain a successful outdoor education program." Extension respondents ranked both those needs significantly higher than the WVEEA members.

Table 5.

Mann-Whitney U Tests Comparing Professional Development Needs Between Groups

N=45 (WVEEA) N=38 (Extension)	WVEEA	Ext.	Z score	Sig.
How to improve your program, based on current EE research	39.20	42.01	-.585	.559
How to maximize environmentally responsible behavior	43.93	37.51	-1.324	.186
How to evaluate	40.53	41.55	-.207	.836
The NAAEE guidelines for excellence in environmental education	44.40	36.96	-1.571	.116
How to engage youths	36.25	47.55	-2.21	.027*
How to maintain a successful outdoor education program	36.12	48.96	-2.600	.009*
Curriculum review	39.38	42.93	-.737	.461
How to deliver effective teacher training workshops	39.70	43.69	-.828	.407
How to design teaching resources (i.e., activity book, multi-media, etc.)	41.92	39.91	-.424	.671
How to reach and broaden your audience	40.68	42.50	-.385	.701
How to find current research on environmental issues	40.08	43.14	-.619	.536
*Significant difference at $p < .05$				

Discussion

The results of the study have important implications for connecting Extension and Environmental Education providers in West Virginia and potentially elsewhere. Being able to understand the needs of Environmental educators and Extension agents across the state can provide a direction for both groups to focus their efforts, as well as develop linkages with each other.

There appears to be a gap between the groups—neither saw the other as an important source of information. While most Extension agents knew of environmental education programs in their counties, these programs

focused on more traditional Extension topics, such as agriculture, and many were likely run by Extension agents. In addition, conservation groups were infrequently noted as sources of material or information for Extension. This seemingly limited interaction was also highlighted by the fact that most environmental education providers reported that Extension agents were one of the least important sources for their information. These findings reveal a potential opportunity for both Extension and environmental education providers to network and partner—as sources of information, and for programming.

There were several similarities and differences among the groups' responses to barriers. Both groups noted barriers related to dealing with schools, such as teachers lacking time and busing cost issues, as well as funding problems for programs. Over the past few years, the rising cost of fuel has hampered field trip budgets of schools. In addition, the No Child Left Behind Act may have had a negative effect on anything deemed not academically essential, including such "extras" as field trips to nature centers. One potential solution for program providers to tackle both these school issues is to develop more "moving programs" that could be taken to schools. If teachers do not have time or resources to come to environmental program locations, consideration needs to be given to taking programs to the schools. In addition, by bringing environmental educators and Extension agents together to share program information and resources (through conferences, online networking, etc.), they can work together to develop joint programs in order to reduce costs, eliminate overlap in programming and thus have resources to broaden their audiences.

Extension agents indicated that *lack of time* to plan programs was a key barrier; this supports findings from past research (Ham & Sewing, 1988; Monroe, Jacobson, & Bower, 2003). Extension agents may feel that the addition of environmental education goes beyond their current work responsibilities. However, working in collaboration with environmental educators and conservation groups could benefit all groups by reaching wider audiences with less cost and duplication of effort. When barriers that affect the two groups are compared, it appears there are opportunities for the WVEEA members and Extension agents to work together.

Three items were found to be significant barriers for Extension agents, but were not significant barriers for WVEEA respondents: *lack of curriculum fit*, *don't hear about professional development opportunities*, and *volunteer burnout*. Partnership opportunities could exist when one group perceives a barrier and the other group does not—the findings from the study reported here could start the discussion between the two groups to determine how they could work together to overcome barriers.

For example, the WVEEA group could assist Extension agents by attending a statewide WVU Extension meeting and offering professional development opportunities related to improving curriculum fit and working with volunteers to prevent burnout. In addition, increasing networking among the groups, through linking websites, Web resources, and attending each other's respective conferences, etc., could serve to promote professional development opportunities for both organizations. County Extension agents could also partner with environmental education groups to set up booths at county fairs. These types of interactions would take little additional time because they are likely already part of their annual schedule (attending state conferences, county fairs, etc.), but could potentially have a significant payoff.

Differences existed in responses to *lack of time to plan, develop or update programs*, *teachers lack interest*, and *low demand from key audiences*. Further studies should address why these items were perceived to be barriers to one group and not the other. For example, Extension agents reported *teachers lack interest to fully participate in programs* as a major barrier, while WVEEA respondents did not. Potential reasons for this finding could be due to differing expectations and knowledge levels with respect to environmental education programs. Understanding why differences in perceived barriers exist between the two groups would allow the groups to strategically develop relevant and meaningful opportunities to benefit each other. Extension agents rated all barriers as more significant than WVEEA members, and most differences were

statistically significant. Future research should analyze the causes behind this finding, which could then lead to further collaborative opportunities.

There were also some similarities as well as differences in regards to needed professional development opportunities. The similarities reveal additional ways to link the groups. The fact that both groups would like to broaden their audiences suggests a motivation to improve networking between the two groups. Joint professional development opportunities could be offered at their respective conferences and meetings that address the topic of *how to broaden audiences*, in that both groups rated this as valuable.

In general, the Extension agents rated all professional development opportunities higher than the environmental education providers, with the exception of one: using and adapting the NAAEE Guidelines. While Extension agents are involved in several types of environmental education programs through youth programs and the community, they are tasked with a wide variety of other issues to help communities. Extension agents may not be aware of NAAEE guidelines, and this could explain why they would be less interested in specific environmental education guidelines. Finally, while Extension respondents tended to rank most of the opportunities higher than environmental education providers, there were very few from either group who indicated any of the opportunities as being "not valuable," which indicates that the majority of both groups may have an interest in any professional development opportunities that might be offered.

Conclusion

Based on the results of the study reported here, members of WVEEA should work to develop a means to network with Extension agents and other environmental education providers. The first step should be to address the information and awareness gap between the two groups by connecting websites and Web resources. Providing professional development opportunities that are important to both groups would be a means for creating further linkages between the two groups. By developing more collaboration between West Virginia environmental educators and Extension agents, programs can be more effectively offered to communities. As calls for Extension to broaden its audiences and maintain relevance in changing times continue, linking with similar groups is one way to accomplish this objective. By reaching out to partner with environmental, conservation, and other natural resources groups, Extension can help lead the way in providing information needed to promote sustainable communities.

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