

Extension and Research Faculty Perspectives of Extension-Research Integration: Opportunities and Challenges

Anil Kumar Chaudhary

University of Florida

Rama Radhakrishna

The Pennsylvania State University

This study examined the perspectives of Extension and research faculty regarding integration of Extension and research (E-R) activities. Faculty with 50% or greater appointments in Extension or research at a Land-Grant University in the northeastern United States were identified as subjects for the study (N = 59). Study objectives were to determine the current status of E-R integration efforts, understanding of Extension and research faculty roles, barriers to E-R integration, and strategies for strengthening E-R integration activities. An instrument was developed by the researchers and data were collected using SurveyMonkey. Descriptive statistics were used to summarize data. Findings indicated that 1) both faculty groups strongly agreed that joint appointments are necessary for effective E-R integration; 2) Extension faculty viewed their role as the face of the university in that they are the link between campus and community; 3) barriers to E-R integration included lack of equal status in terms of research taking precedence over Extension, limited funding, and lack of recognition for Extension work; and 4) strategies suggested by both faculty groups included hiring more faculty with split appointments in Extension and research, increasing interdisciplinary research, enhancing funding for integration efforts, and providing graduate assistantships that involve E-R integration activities.

Keywords: Extension, research, integration, faculty, Land-Grant University

Introduction

Even with diverse organizational and cultural identities, Extension and research tried to work together over decades as they were tied together by a common Land-Grant University mission (Bennett, 2000). In the era of deep budget cuts, complex accountability, and staffing structures (Peters & Franz, 2012), unification of Extension and research is imperative. Further, to address critical issues facing society in a coherent way, Land-Grant Universities must emphasize integrated research and education activities (Kellogg Commission Report on the Future of State and Land-Grant Institutions, 1999).

Direct correspondence to Anil Kumar Chaudhary at akchaudhary@ufl.edu

The 1998 Agricultural Research, Extension, and Education Reform Act (AREERA) emphasized the need for joint plans of work from Land-Grant institutions. Further, the 1998 AREERA Act authorizes the U.S. Department of Agriculture (USDA) to fund projects that integrate research, education, and Extension activities.

According to Hamilton, Chen, Pillemer, and Meador (2013), Extension educators have been considered experts in taking the latest university-generated research and making it available to stakeholders in the form of science-based information and educational programs. Further, problems faced by farmers and the general public relative to a new technology or practice would be conveyed to the researchers and laboratories so that corrections could be made to the new technologies. At the time of shrinking budgets, Braverman, Franz, and Rennekamp, (2012) stressed the importance of cross-program and multidisciplinary collaboration to address the issues faced by vulnerable and high-risk populations in urban and suburban areas.

A number of research faculty, Extension specialists, and administrators (Bitsch & Thornsburg, 2010; Decker, 2004; Gorsuch, 1999; Gould & Ham, 2002; Hamilton et al., 2013; Warner, Hinrichs, Schneyer, & Joyce 1998) have examined issues and concerns relative to Extension and research (E-R) integration activities. A consensus from these studies suggests varying views of E-R integration. Warner et al. (1998) examined challenges and limitations to involving Extension educators and researchers in research projects designed to test theory. According to Warner et al. (1998), “collaborations between researchers and Extension educators have traditionally been viewed as a division of labor which distances Extension agents from the research process and the researchers from Extension practice” (p. 4). They identified several challenges to E-R collaboration: 1) diverging views on research design and methodology, 2) the lack of theory used in Extension practice, and 3) different organizational styles and cultures (Warner et al., 1998).

Decker (2004), the former Director of Cornell University Agricultural Experiment Station, proposed collaboration in the work of Extension educators and researchers at local sites for better reach of research findings to the community of relevant stakeholders. E-R integration efforts occur throughout the Land-Grant University system (Gould & Ham, 2002). In their study of Directors of Agricultural and Experiment Stations (AES) and Cooperative Extension Systems (CES), Gould and Ham (2002) found 86% of the directors indicated that enhancing collaborative efforts between AES and CES was a concern. The directors identified several barriers to E-R integration efforts in their universities, which included lack of funding sources, different expectations from different faculty, different reporting for Extension and research faculty and lack of proper administrative support (Gould & Ham, 2002). Suggestions to strengthen E-R integration were a strategic plan/vision to enhance collaboration, funding opportunities, engagement of Extension scientists in applied research, proposals to stimulate E-R integration, cohousing, outreach expectations for all faculty, housing of Extension and research in same

departmental units, requirements to include Extension components in all research projects, and incentives to enhance E-R integration (Gould & Ham, 2002). According to McGrath (2006), campus-based research and teaching faculty resist the approach to apply research findings and service to the community, whereas Extension field faculty resist more scholarly work and publication of their work in refereed journals because of concerns associated with research methodology and rigor. McGrath (2006) concluded that the possible barriers to poor collaboration among Extension and research faculty would be too much time commitment to research and teaching responsibilities and lack of recognition and rewards for integration activities, whereas Extension faculty lack resources that promote collaboration.

A team approach as a mechanism to strengthen E-R integration was examined by Bitsch and Thornsby (2010). They studied how teams of both Extension and research faculty, with different disciplines' help, address critical issues facing society. They found that integrated teams helped in problem identification and problem solving and served as a connecting link between campus and field staff. In addition, the team approach facilitated learning among both groups of faculty. However, Bitsch and Thornsby (2010) found some interesting challenges to the team approach. These included different outcome evaluations for E-R faculty, lack of time, rigid requirements from both Extension and research, lack of understanding by administration that evaluation is different for Extension and research, and lack of funding/budget for integrated activities (Bitsch & Thornsby, 2010). Braverman et al. (2012) proposed the removal of past program evaluation parameters and cultural norms for better collaboration across disciplines.

E-R faculty currently hold partly similar and partly dissimilar views about integration efforts, especially in the areas of planning, implementing, and evaluating projects and programs (Bennett, 2000). As years have passed, the success of integration efforts between Extension and research has been questioned by faculty, researchers, program leaders, administrators, planners, and government, at both federal and state levels. Are there substantial benefits to joint E-R work? If yes, then what do E-R faculty identify as benefits? Answers to these questions will help 1) better understand the current status of integrated E-R efforts; 2) motivate faculty and researchers to engage and excel in collaborative E-R projects; and 3) lead to systematic planning, development, implementation, and evaluation of E-R programs/projects.

Purpose and Objectives

The overall purpose of this study was to describe the current status of E-R integration as perceived by E-R faculty. The specific objectives of the study were to

- 1) Determine the perceptions of E-R faculty regarding integration activities;
- 2) Ascertain the roles of E-R faculty in E-R integration activities;
- 3) Identify barriers to E-R integration activities; and
- 4) Determine strategies for strengthening E-R integration activities.

Methodology

Study Design and Population

This study used a descriptive, cross-sectional survey design. Data came from a larger Agricultural Experimentation project in the College of Agricultural Sciences (CAS) at the Pennsylvania State University.

The target population consisted of all faculty with split appointments of 50% or greater Extension and research. The frame was obtained from the records maintained in the Human Resources Office. The office provided the actual appointment for each faculty and email addresses. Further, the list was verified by the department heads/unit leaders in the CAS to make sure that the appointment splits were accurate. As a result of this procedure, a total of 59 faculty with joint E-R appointments were identified as subjects for the study.

Instrumentation

A five-section instrument was developed to collect data. The questions in the instrument were based on the results of focus group interviews (Krueger & Casey, 2009) previously conducted with select E-R faculty (Radhakrishna, Tobin, & Foley, 2014). Four themes that emerged from the focus groups formed the basis for the questions/statements included in this instrument. The themes were 1) current status of integration activities, 2) understanding of E-R faculty roles, 3) barriers to integration, and 4) strategies for strengthening E-R integration activities. Section one contained 19 statements relative to the perceptions of current status of E-R integration activities, while section two contained 18 statements relative to understanding of roles of E-R faculty. Statements in sections one and two were measured on a five-point Likert scale that ranged from 1 = *Strongly Disagree* to 5 = *Strongly Agree*. Section three contained 16 statements regarding barriers to E-R activities, measured on a four-point scale that ranged from 1 = *Not at all a Barrier* to 4 = *Very Much a Barrier*. Section four contained 22 statements regarding strategies to strengthen E-R integration activities that were measured on a five-point Likert scale ranging from 1 = *Strongly Disagree* to 5 = *Strongly Agree*. The fifth and final section of the instrument elicited demographic information, such as gender, education level, major area, previous appointments in Extension and/or research, degree-granting institution (Land-Grant or Non-Land-Grant) for the highest degree received, and years in current position.

Face and content validity of the instrument was established through review by an expert panel of faculty with Extension and research appointments, staff, and graduate students working in research projects and Extension programs. Research and Extension faculty who participated in the focus group interviews were not considered to review the instrument. The study was approved by the Institutional Review Board of the Pennsylvania State University. After

incorporating all suggestions made by the expert panel, a pilot test was carried out using other Extension and research faculty not included in the target population and graduate students. Cronbach's alpha for the first four sections of the instrument was computed. A few negatively-related items in sections one and three were removed to increase the alpha level. Cronbach's alpha coefficients for the first four sections were 0.67 (current status), 0.64 (understanding faculty roles), 0.88 (barriers), and 0.86 (strategies).

Data Collection and Analysis

The revised instrument was uploaded into SurveyMonkey for data collection. Dillman's *Tailored Design Method* was used to collect data (Dillman, Smyth, & Christian, 2009). An initial pre-notification email with a consent form was sent to all 59 faculty. In all, three reminders were sent to all those who did not respond to initial and subsequent reminders. A total of 37 faculty responded for a return rate of 62.7%. Nonresponse error was addressed by comparing early, late, and nonrespondents as per procedures suggested by Miller and Smith (1983). Descriptive statistics, including frequencies and percentages, were calculated to summarize the data as appropriate.

Findings

Demographic Profile of Faculty

Out of those 37 faculty who responded to the survey, 23 (62%) were males, 14 (38%) were females. Almost all of them reported their highest educational level as a doctorate degree, and most of them graduated from Land-Grant Universities. The major for their doctorate degree represented most disciplines in the Agricultural Sciences, thus including agriculture and Extension education, plant pathology, vegetable crops, soil science, animal science, food science, and others. Close to one-half (49%, $n = 17$) were Extension specialists. Forty percent ($n = 15$) were research scientists, while 11% ($n = 5$) did not provide information on their appointment types. With respect to experience in their current positions, faculty averaged 17.8 years with a low of 0.5 years and a high of 45 years. A little over 50% of faculty had either Extension or research responsibilities in their previous position.

Objective 1: Faculty Perceptions

Both groups of faculty were asked to indicate their perceptions toward E-R integration activities on a five-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). Results are shown in Table 1. Most of the E-R faculty either agreed or strongly agreed that *Joint appointments in research and Extension promote integration* [E = 15 (88.2%); R = 15 (100%)]; *Research provides fundamental information for Extension programs* [E = 16 (94.1%); R = 14 (93.3%)];

Conversations between Extension and research could create new insights to address critical issues facing society [E = 17 (100%); R = 15 (86.7%)] and *Interdisciplinary collaboration efforts between Extension and research are occurring* [E = 16 (94.1%); R = 13 (86.1%)]. However, half (47.1%) of Extension and one-third (33.3%) of research faculty were neutral to *Funding at the local level facilitates integration*, and half of both Extension (47.1%) and research (46.7%) faculty disagreed that *Extension's local emphasis often limits opportunities to integrate with research*.

Table 1. Perceptions of Extension-Research Integration Activities by University Extension (n = 17) and Research (n = 15) Personnel

Statement	Agree f (%)		Not Sure f (%)		Disagree f (%)	
	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty
Joint appointments in research and Extension promote integration.	15 (88.2)	15 (100)	2 (11.8)	0	0	0
Funding at the Federal level facilitates integration.	13 (76.5)	9 (60)	3 (17.6)	3 (20)	1 (5.9)	3 (20)
Funding at the State level facilitates integration.	9 (56.3)	8 (53.3)	5 (31.3)	3 (20)	2 (12.5)	4 (26.7)
Funding at the Local level facilitates integration.	6 (35.3)	6 (40)	8 (47.1)	5 (33.3)	3 (17.6)	4 (26.7)
Funding at the College level facilitates integration.	9 (52.9)	9 (60)	6 (35.3)	2 (13.3)	2 (11.8)	4 (26.7)
Integration between Extension and research activities depends on target audience.	8 (47.1)	13 (86.7)	6 (35.3)	1 (6.7)	3 (17.6)	1 (6.7)
Understanding research activities by Extension administrators facilitates integration.	10 (58.8)	10 (66.7)	5 (29.4)	3 (20)	2 (11.8)	2 (13.3)
Understanding Extension activities by research administrators facilitates integration.	11 (64.7)	10 (66.7)	3 (17.6)	4 (26.7)	3 (17.6)	1 (6.7)
Extension's local emphasis often limits opportunities to integrate with research.	5 (29.4)	7 (46.7)	4 (23.5)	1 (6.7)	8 (47.1)	7 (46.7)
Economic impact of research activities is hard to measure.	10 (58.8)	6 (42.9)	1 (5.9)	2 (14.3)	6 (35.3)	6 (42.9)
Social impact of research activities is hard to measure.	11 (64.7)	8 (53.3)	2 (11.8)	2 (13.3)	4 (23.5)	5 (33.3)
Interdisciplinary collaboration efforts between Extension and research are occurring.	16 (94.1)	13 (86.7)	1 (5.9)	2 (13.3)	0	0
Research has become more important at the university level, compared to Extension.	16 (94.1)	13 (86.7)	1 (5.9)	1 (6.7)	0	1 (6.7)
Extension component is included in research projects to satisfy funding requirements.	15 (88.2)	11 (73.3)	2 (11.8)	1 (6.7)	0	3 (20)
Extension has a good record of extending university-based knowledge to clientele.	15 (88.2)	12 (80)	2 (11.8)	2 (13.3)	0	1 (6.7)

Extension provides a context for research to test theory.	12 (70.6)	10 (66.7)	4 (23.5)	4 (26.7)	1 (5.9)	1 (6.7)
Research provides fundamental information for Extension programs.	16 (94.1)	14 (93.3)	0	1 (6.7)	1 (5.9)	0
Effective partnerships between Extension and research can result in social change.	14 (82.4)	13 (86.7)	3 (17.6)	2 (13.3)	0	0
Conversations between Extension and research could create new insights to address critical issues facing society.	17 (100)	13 (86.7)	0	2 (13.3)	0	0

Note: The term *Agree* refers to combined responses of *Strongly Agree* and *Agree*. The term *Disagree* refers to combined responses of *Strongly Disagree* and *Disagree*.

Objective 2: Understanding Faculty Roles

As seen in Table 2, both groups of faculty agreed that they understood the roles of E-R faculty in university settings. The top five statements to which both groups agreed were *Extension faculty are motivated by the public value of what they do* [E = 15 (93.8%); R = 15 (100%)]; *Extension serves as a link between the university and the public* [E = 15 (93.8%); R = 14 (93.3%)]; *Capitalizing on each other's role will strengthen integration efforts* [E = 15 (93.8%); R = 12 (80%)]; *Research faculty are accountable to funding agencies* [E = 15 (93.8%); R = 12 (80%)]; and *Extension faculty can enable research faculty to consider the practical implications of their work* [E = 14 (87.5%); R = 12 (80%)]. However, most Extension (87.5%) and research (86.7%) faculty disagreed that *Extension faculty have limited understanding of the research process*, while one-fourth of Extension (18.8%) and two-thirds of research (60%) faculty were neutral to *Extension helps inform research faculty of the citizens' needs that require further investigation*.

Table 2. Understanding Roles of Extension and Research Faculty by University Extension (n = 17) and Research (n = 15) Personnel

Statement	Agree f (%)		Not Sure f (%)		Disagree f (%)	
	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty
Capitalizing on each other's role will strengthen integration efforts.	15 (93.8)	12 (80)	1 (6.3)	3 (20)	0	0
Research faculty only look at the research process, not its application at the local level.	7 (46.7)	5 (33.3)	1 (6.7)	3 (20)	7 (46.7)	7 (46.7)
Research faculty view funding agencies as their major stakeholders.	10 (62.5)	12 (80)	3 (18.8)	1 (6.7)	3 (18.8)	2 (13.3)
Research faculty are accountable to funding agencies.	15 (93.8)	12 (80)	1 (6.3)	3 (20)	0	0
Extension faculty are accountable to the public.	14 (87.5)	10 (66.7)	0	2 (13.3)	2 (12.5)	3 (20)
Extension faculty are motivated by the public value of what they do.	15 (93.8)	15 (100)	1 (6.3)	0	0	0
Research faculty are motivated by discovery/innovation.	14 (87.5)	11 (73.3)	2 (12.5)	4 (26.7)	0	0

Extension serves as a link between the university and the public.	15 (93.8)	14 (93.3)	1 (6.3)	0	0	1 (6.7)
Extension helps inform research faculty of the citizens' needs that require further investigation.	12 (75)	5 (33.3)	3 (18.8)	9 (60)	1 (6.3)	1 (6.7)
Research faculty are viewed more positively in the college, compared to Extension faculty.	12 (75)	13 (86.7)	3 (18.8)	1 (6.7)	1 (6.3)	1 (6.7)
Research faculty often have limited understanding of the role of Extension.	15 (93.8)	11 (73.3)	1 (6.3)	2 (13.3)	0	2 (13.3)
Extension faculty can enable research faculty to consider the practical implications of their work.	14 (87.5)	12 (80)	1 (6.3)	2 (13.3)	1 (6.3)	1 (6.7)
Research faculty help Extension to test theory through practical applications.	8 (50)	9 (60)	5 (31.3)	1 (6.7)	3 (18.8)	5 (33.3)
Integration helps Extension faculty to be full partners in the research process.	10 (66.7)	7 (46.7)	3 (20)	4 (26.7)	2 (13.3)	4 (26.7)
Integration helps research faculty to be full partners in the program development process.	9 (56.3)	6 (40)	5 (31.3)	6 (40)	2 (12.5)	3 (20)
Research faculty must be sensitive to Extension's use of research process (rigor, experimental design, instrumentation, etc.).	9 (56.3)	10 (66.7)	6 (37.5)	3 (20)	1 (6.3)	2 (13.3)
Extension faculty have limited understanding of the research process.	2 (12.5)	2 (13.3)	0	0	14 (87.5)	13 (86.7)
Research faculty have limited understanding of Extension program development process.	14 (87.5)	12 (80)	0	2 (13.3)	2 (12.5)	1 (6.7)

Note: The term *Agree* refers to combined responses of *Strongly Agree* and *Agree*. The term *Disagree* refers to combined responses of *Strongly Disagree* and *Disagree*.

Objective 3: Barriers

Both groups of faculty were asked to indicate barriers to E-R integration activities on a four-point scale (1 = *Not at all a Barrier*, 2 = *Somewhat a Barrier*, 3 = *A Barrier*, and 4 = *Very Much a Barrier*). Results are shown in Table 3. Both groups of E-R faculty perceived the following statements as *barriers* to E-R integration efforts: *Extension not valued as highly as research in career tracks at the university level* [E = 17 (100%); R = 15 (100%)]; *Perception that in promotion and tenure reviews, research-based publications are more valued than field-based Extension publications* [E = 16 (94.1%); R = 15 (100%)]; *Lack of funding to carry out E-R integrated activities* [E = 15 (93.8%); R = 15 (100%)]; *Perception that Extension work is not being recognized* [E = 15 (88.2%); R = 14 (100%)]; and *Excessive accountability requirements limit time available for Extension faculty to branch out from their specialties* [E = 15 (88.2%); R = 14 (100%)]. However, half of the E-R faculty did not consider *Rigid requirements within Extension that prevent working with research faculty* to be a barrier, while the other half did.

Table 3. Barriers to Effective Extension-Research Integration by University Extension (n = 17) and Research (n = 15) Personnel

Statement	Not at all a Barrier f (%)		A Barrier f (%)	
	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty
Perception that Extension work is not being recognized	2 (11.8)	0	15 (88.2)	14 (100)
Lack of availability of seed money for Extension-research integration	4 (23.5)	0	13 (76.5)	15 (100)
Lack of interaction of research faculty with Extension advisory committees	6 (37.5)	1 (7.1)	10 (62.5)	13 (92.9)
Research and Extension activities are viewed differently by state government	5 (29.4)	0	12 (70.6)	13 (100)
Lack of administrative structure to support integration activities	4 (23.5)	0	13 (76.5)	14 (100)
Lack of funding to carry out integrated activities	1 (6.3)	0	15 (93.8)	14 (100)
Perception that in promotion and tenure (P&T) reviews, research-based publications are more valued than field-based Extension publications	1 (5.9)	0	16 (94.1)	15 (100)
Extension not valued as highly as research in career tracks at the university level	0	0	17 (100)	15 (100)
Lack of time to involve integrated activities in research projects	3 (17.6)	2 (14.3)	14 (82.4)	12 (85.7)
Rigid requirements within Extension that prevent working with research faculty	10 (58.8)	6 (42.9)	7 (41.2)	8 (57.1)
Rigid administrative structure preventing communication horizontally across the college	8 (47.1)	2 (14.3)	9 (52.9)	12 (85.7)
Rigid administrative structure preventing communication vertically within Extension	8 (47.1)	1 (7.1)	9 (52.9)	13 (92.9)
Lack of communication between department heads and Extension administration	3 (17.6)	2 (14.3)	14 (82.4)	12 (85.7)
Lack of communication between Extension administration and Extension faculty	2 (11.8)	2 (15.4)	15 (88.2)	11 (84.6)
Internal conflicts for faculty over time spent on research vs. Extension activities	5 (29.4)	1 (7.1)	12 (70.6)	13 (92.9)
Excessive accountability requirements limit time available for Extension faculty to branch out from their specialties	2 (11.8)	0	15 (88.2)	14 (100)

Note: The term *A Barrier* refers to combined responses of *Somewhat a Barrier*, *A Barrier*, and *Very Much a Barrier*.

Objective 4: Strategies

Table 4 depicts the perceptions of both Extension and research faculty regarding strategies for strengthening E-R integration activities. Both groups agreed that the following strategies will help strengthen E-R integration at the local, college, and university levels: *Creating positions that combine both Extension and research functions* [E = 16 (94.1%); R = 14 (93.3%)]; *Identifying new initiatives like AFRI from USDA requiring integration of both research and Extension* [E = 14 (87.5%); R = 15 (100%)]; *Allocating research money properly to support Extension programs* [E = 17 (100%); R = 13 (86.7%)]; *Networking among Extension and*

research faculty [E = 16 (94.1%); R = 13 (86.7%)]; *Increasing number of graduate assistantships to work with Extension faculty* [E = 16 (94.1%); R = 13 (86.7%)]; and *Increased federal funding for integrative activities* [E = 13 (76.5%); R = 15 (100%)]. However, one-third of Extension (29.4%) and one-half of research (46.7%) faculty were neutral to *Conducting departmental seminars to help connect campus*, and nearly one-half (46.7%) of research and one-third (31.3%) of Extension faculty disagreed that *Pairing Extension faculty with research faculty* would be good strategies for effective E-R integration.

Table 4. Strategies for Effective Extension-Research Integration by University Extension (n = 17) and Research (n = 15) Personnel

Statement	Agree f (%)		Not Sure f (%)		Disagree f (%)	
	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty	Extension Specialist	Research Faculty
Increased federal funding for integrative activities	13 (76.5)	15 (100)	2 (11.8)	0	2 (11.8)	0
Creating positions that combine both Extension and research functions	16 (94.1)	14 (93.3)	1 (5.9)	0	0	1 (6.7)
Building an Extension/education component through research grants	14 (82.4)	12 (80)	3 (17.6)	2 (13.3)	0	1 (6.7)
Allocating research money properly to support Extension programs	17 (100)	13 (86.7)	0	2 (13.3)	0	0
Establishing integrated Extension-research centers at the local level	3 (17.6)	6 (40)	9 (52.9)	7 (46.7)	5 (29.4)	2 (13.3)
Conducting departmental seminars to help connect campus and departments	7 (41.2)	8 (53.3)	5 (29.4)	7 (46.7)	5 (29.4)	0
Establishing faculty advisory committees to oversee integration activities	5 (29.4)	4 (26.7)	3 (17.6)	8 (53.3)	9 (52.9)	3 (20)
Networking among Extension and research faculty	16 (94.1)	13 (86.7)	1 (5.9)	2 (13.3)	0	0
Increasing engagement with multidisciplinary institutes	11 (64.7)	10 (66.7)	3 (17.6)	3 (20)	3 (17.6)	2 (13.3)
Self-promotion—sharing your work with others	12 (70.6)	11 (73.3)	5 (29.4)	3 (20)	0	1 (6.7)
Pairing Extension faculty with research faculty	9 (56.3)	7 (46.7)	2 (12.5)	5 (33.3)	5 (31.3)	3 (20)
Establishing a strong working relationships among research and Extension administrators	12 (70.6)	12 (80)	5 (29.4)	3 (20)	0	0
Appointing Extension associates to work with research faculty	7 (41.2)	8 (53.3)	4 (23.5)	4 (26.7)	6 (35.3)	3 (20)
Appointing research associates to work with Extension faculty	9 (52.9)	7 (46.7)	4 (23.5)	6 (40)	4 (23.5)	2 (13.3)

Identifying new initiatives like AFRI from USDA requiring integration of both research and Extension	14 (87.5)	15 (100)	1 (6.3)	0	1 (6.3)	0
Beginning conversations among Extension and research faculty regarding integration	12 (75)	11 (73.3)	2 (12.5)	4 (26.7)	2 (12.5)	0
Increasing number of graduate assistantships to work with Extension faculty	16 (94.1)	13 (86.7)	1 (5.9)	2 (13.3)	0	0
Exposing research faculty to the community to understand the importance of Extension	14 (82.4)	10 (66.7)	1 (5.9)	3 (20)	2 (11.8)	2 (13.3)
Identifying more incentives to carry out integrated activities	14 (82.4)	10 (66.7)	3 (17.6)	4 (26.7)	0	1 (6.7)
Establishing private/public partnerships to target innovative areas of interest	14 (82.4)	8 (53.3)	2 (11.8)	5 (33.3)	1 (5.9)	2 (13.3)
Improving modes of communication between Extension faculty and stakeholders	8 (47.1)	11 (73.3)	7 (41.2)	4 (26.7)	2 (11.8)	0
Encouraging Extension and research faculty to serve together on graduate committees to spur integration	15 (88.2)	13 (86.7)	2 (11.8)	2 (13.3)	0	0

Note: The term *Agree* refers to combined responses of *Strongly Agree* and *Agree*. The term *Disagree* refers to combined responses of *Strongly Disagree* and *Disagree*.

Discussion and Conclusions

The findings of this study suggest that E-R faculty have similar views toward E-R integration. Both groups view integration as a positive, much-needed undertaking at Land-Grant Universities. Overall, both groups of faculty agreed that integration is occurring throughout the university system, which is partly driven by the mandates of external funding agencies. To this end, both groups agree that joint appointments in Extension and research are necessary to address complex issues facing society (Hamilton et al., 2013).

Both groups of faculty recognized and understood each other's role in the college and university. Both groups agreed that Extension is a link between the university and the public (Bitsch & Thornsberry, 2010) and that they should capitalize on each other's role to strengthen integration activities. Further examination of the roles of E-R faculty revealed that research was viewed as more important and valued compared to Extension, and research faculty have limited understanding of what Extension faculty do, while Extension faculty understand the research process.

Both research and Extension faculty perceived many barriers to integration efforts. Major barriers included the lack of equal status among research and Extension and less appreciation of

the work of Extension faculty compared to research faculty. The campus culture wherein contributions of research faculty are more valued than those of Extension faculty, especially in promotion and tenure reviews, was considered a barrier. Additionally, lack of funding, especially for integrated activities, and too much time spent by Extension faculty on accountability and reporting activities were seen as barriers to integration. These barriers are consistent with barriers identified by Braverman et al. (2012), Gould and Ham (2002), and McGrath (2006).

Regarding strategies to strengthen E-R integration activities, there was consensus among both groups of faculty. Key strategies for strengthening integration activities included split appointments of faculty in Extension and research; increased funding in the form of seed money or the national grants, such as AFRI from USDA; proper allocation of research money to support Extension programs; increased conversation between research and Extension faculty; increased number of graduate assistants to work exclusively in integrated projects and/or programs; and increased federal grants that promote E-R integration. Both research and Extension administration should recognize the importance of integration in a more coherent way. In addition, serving on graduate student committees, more inclusion of Extension/education components in research grants, and exposure of research faculty to the extension of research findings to the community were also viewed as strategies to spur E-R integration. The strategies proposed by this study are in agreement with findings of Braverman et al. (2012), Decker (2004), and Gould and Ham (2002).

Implications and Recommendations

The findings of this study can be useful in determining the value of E-R integration efforts. A strong E-R linkage will help in broader understanding of past and future benefits of E-R efforts to the public good. Further, E-R integration will help develop better institutional mechanisms for connecting innovations in research and new knowledge developed to a diverse public who are the consumers of that knowledge.

It is recommended that a Center for Extension-Research Integration be established with a goal to identify, develop, implement, and evaluate E-R integration efforts. In addition, the Center should also help as a springboard for securing resources for faculty and Extension educators to carry out integration efforts. Further, both Extension and research administration should commit resources to facilitate integration. Perhaps a percentage of research grants secured from both private and public entities could be earmarked for integration efforts.

Future research involving Extension educators, other research staff, and administrators to make informed decisions about E-R integration activities should be undertaken and should serve as a springboard for further research.

Finally, E-R integration facilitates the integration of a deep understanding of science and technology (through research) with practical knowledge, a hands-on orientation (through Extension), and experimental skills and insights (through E-R integration).

Limitations

Caution is advised in interpreting the findings of the study because of small sample size, limiting further statistical analysis, such as factor analysis. According to Tabachnick and Fidell (1996), the general practice when using factor analysis is to have at least 300 cases and a minimum ratio of five cases for every variable (Gorsuch, 1983). The sample size and the number of variables used in this study did not meet the criteria for using factor analysis.

References

- Agricultural Research, Extension, and Education Reform Act of 1998. Pub. L. 105-185.
Retrieved from <http://www.ag.senate.gov/download/agricultural-research-extension-and-education-reform-act-of-1998-public-law-105-185>
- Bennett, C. (2000). *Proposing collaborative research, Extension, and teaching projects: Contribution by evaluators*. Paper presented at the American Evaluation Association Conference, Honolulu, Hawaii.
- Bitsch, V., & Thornsby, S. (2010). Building teamwork into an integrated Extension program: Faculty perspectives on area of expertise teams. *Journal of Extension*, 48(4), Article 4FEA2. Retrieved from <http://www.joe.org/joe/2010august/a2.php>
- Braverman, M. T., Franz, N. K., & Rennekamp, R. A. (2012). Extension's evolving alignment of programs serving families and youth: Organizational change and its implications. *Journal of Extension*, 50(6), 6FEA1. Retrieved from <http://www.joe.org/joe/2012december/a1.php>
- Decker, D. J. (2004). Integrating research and Extension to achieve the Land-Grant mission: The CUAES Vision and Philosophy. *CALS Connect*.
- Dillman, D., Smyth, J., & Christian, L. (2009). *Internet, mail, and mixed-mode surveys: The Tailored Design Method* (3rd ed.). New York, NY: John Wiley and Sons.
- Gorsuch, C. S. (1999). *CU-AIMS – How does a program fit?* Paper presented at the CU-AIMS Conference, Clemson University, Clemson, SC.
- Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Gould, R., & Ham, G. (2002). The integration of research and Extension: A preliminary study. *Journal of Extension*, 40(4), Article 4FEA3. Retrieved from <http://www.joe.org/joe/2002august/a3.php>
- Hamilton, S. F., Chen, E. K., Pillemer, K., & Meador, R. H. (2013). Research use by Cooperative Extension educators in New York state. *Journal of Extension*, 51(3), Article 3FEA2. Retrieved from <http://www.joe.org/joe/2013june/a2.php>

- Kellogg Commission on the Future of State and Land-Grant Institutions. (1999). *Returning to our roots: The engaged institution, third report*. National Association of State Universities and Land-Grant Colleges. Retrieved from <http://www.aplu.org/library/returning-to-our-roots-the-engaged-institution/file>
- Krueger, R. A., & Casey, M. A. (2009). *Focus groups: A practical guide for applied research* (4th ed.). Thousand Oaks, CA: Sage Publications.
- McGrath, D. M. (2006). The scholarship of application. *Journal of Extension*, 44(2), Article 2FEA8. Retrieved from <http://www.joe.org/joe/2006april/a8.php>
- Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21(5), 45–50. Retrieved from <http://www.joe.org/joe/1983september/83-5-a7.pdf>
- Peters, S., & Franz, N. K. (2012). Stories and storytelling in Extension work. *Journal of Extension*, 50(4), Article 4FEA1. Retrieved from <http://www.joe.org/joe/2012august/a1.php>
- Radhakrishna, R., Tobin, D., & Foley, C. (2014). Integrating Extension and research activities: An exploratory study. *Journal of Extension*, 52(1), Article 1FEA1. Retrieved from <http://www.joe.org/joe/2014february/a1.php>
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York, NY: HarperCollins.
- Warner, M. E., Hinrichs, C., Schneyer, J., & Joyce, L. (1998). From knowledge extended to knowledge created: Challenges for a new Extension paradigm. *Journal of Extension*, 36(4), Article 4RIB1. Retrieved from <http://www.joe.org/joe/1998august/rb1.php>

Anil Kumar Chaudhary is a doctoral student specializing in Extension education and a graduate research assistant in the Department of Agricultural Education and Communication (AEC) in the College of Agricultural and Life Sciences (UF/IFAS) at the University of Florida with a research focus on program evaluation, social network analysis (SNA), and survey methodology. Anil completed his master's degree in Agricultural and Extension Education from The Pennsylvania State University.

Rama Radhakrishna, Ph.D., is a Professor of Agricultural and Extension Education and Assistant Dean for Graduate Education at The Pennsylvania State University with a scholarship focus on program development and evaluation.