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Credible and Actionable Evidence Across Extension Program Areas: A Case Example

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Credible and Actionable Evidence Across Extension Program Areas: A Case Example

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What is credible and actionable evidence can vary by program discipline in the Cooperative Extension Service. Through a series of interviews with program leadership from Agriculture, Natural Resources, Youth Development, Family Development, and Community Vitality, a case study of one state's Extension system is described. While programs certainly vary in epistemological, ontological, and methodological underpinnings, each collects and delivers credible and actionable evidence in ways unique to their stakeholder audience. Diverse Extension programs do share a common mission and a common delivery mechanism (i.e., each works to promote knowledge gain, skill development, and behavior change in people). Therefore, the future of common credible and actionable evidence in Extension may rest on investing in systems that promote a shared science of delivery, engagement, and continuous improvement.

Keywords: Extension history, credible and actionable evidence, interdisciplinary, key-informant interviews

"Even though there are no ways of knowing for sure, there are ways of knowing for pretty sure."

—Lemony Snicket (1999)

Situation

In academia, what is considered credible and actionable evidence is largely discipline-based (Scriven, 2015). However, the Cooperative Extension Service (*Extension*), with its cross-disciplinary content and program areas, requires a broader way of understanding credible and actionable evidence. Add in the fact that Extension is a blending of content (research, science, academic knowledge) and process (how we teach or disseminate the knowledge for application in everyday life) and the notion of credible and actionable evidence grows even more unclear and more complex.

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This article intends to explore the concepts of credible and actionable evidence using University of Minnesota Extension as a case example to illustrate the complex and multifaceted nature of what makes evidence relevant and consequential in Extension work. University of Minnesota Extension's research and outreach is organized broadly into four content *centers*: Agriculture, Food and Natural Resources (AFNR); Community Vitality (CV); Family Development (FD); and 4-H Youth Development (YD). Beyond content, these centers also differ in terms of primary audiences for outreach, educational processes, and funding sources. Yet as the centers share the same mission and promise to discover science-based solutions, deliver practical education and engage citizens to build a better future, they also have commonalities and experience similar challenges in building credible and actionable evidence.

We have a relatively unique situation in University of Minnesota Extension. In 2006, the Dean of Extension requested and received ongoing funding from the University to embed Evaluation and Program Development Specialists in each center/program area. These evaluation specialists then leveraged grants and other resources to organize teams of campus faculty, state, regional and local Extension educators on the promotion track, graduate research assistants and research associates to build a research base for each center to better understand our practice and to study the impacts of Extension programs. These evaluation specialists across the centers meet with the Senior Associate Dean of Extension monthly to discuss evidence and the public value of Extension. We believe this history and context can offer a unique cross-disciplinary perspective when discussing credible and actionable evidence in Extension.

To broaden our perspectives beyond Evaluation specialists, the authors interviewed individual program leaders across centers to learn more about the programmatic aspects related to credible and actionable evidence. In cases where there are two core program areas (e.g., Agriculture and Natural Resources), we interviewed program leaders from each content area. Additionally, if a program leader felt they wanted a perspective from another key person, we accommodated. In total, seven key informants were interviewed. The interviews were semi-structured, informal, and conversational, and are used to illustrate and describe versus to generate empirical and generalizable data. The key informants included program leaders and faculty specialists across program areas. Though the one- to two-hour conversations were informal, the questions we asked were organized around the following foci:

> **Ontological**: What is the nature of what you do and how did your program come to be in Extension? What is the primary contribution of your program area in terms of societal betterment?
> **Epistemological**: How do you know what you do works? What knowledge is deemed consequential and relevant? What theories or frameworks are foundational?
> **Methodological**: What are your thoughts about what may count as credible and actionable evidence for your program? What evidence is determined to be trustworthy,

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relevant, and consequential? How does your program gather data to show evidence? Who do you have to convince?

All interviews were conducted by one or two of the authors (depending on schedule) and were recorded and reviewed to add depth to the article. Our ongoing conversations as well as perspectives of the key informants were organized into core discussion areas to consider when exploring credible, actionable evidence in Extension. The core discussion areas will follow a brief historical overview of Extension programs to add further context. We hope the unique vantage point of this case example can contribute to the overall conversation offered through this special issue of the Journal of Human Sciences and Extension.

Historical Antecedents of Programs

A brief historical overview of Extension programs is pertinent because "what makes us Extension and how we came to be" has not only endured the test of time but continues to add critical context for program development, delivery, and evidence building. In describing this history, it becomes clear how credibility and evidence differ, in part, because of each Extension discipline's historical roots and differences among primary stakeholders.

With the Morrill Act of 1862, the initial land-grant mission was to make university-discovered technological and science-based knowledge accessible to all people, and not just the aristocratic class. During the late 1800s and early 1900s, most land-grant universities developed a series of farmers' institutes, where farmers could avail themselves of university knowledge without attending a university. The scope of the farmers' institutes quickly grew in response to demands to include content in which women and youth were also interested, often because the farmers were, at times, unavailable to attend themselves. 4-H clubs started to emerge in New York and Ohio, dedicated to the practical instruction of youth in skills needed for their work and home life (Seevers & Graham, 2012). Participation by women, and inclusion of topics on issues important to women, also started to grow in Extension during this time, in conjunction with the growing science of home economics and food safety. Extension home demonstration agents taught cooking skills, sewing, nutrition, and various useful skills like home sanitation, financial resource management, and even carpentry, including the construction of ice refrigerators and kitchen cabinets (Seevers & Graham, 2012).

Meanwhile, the science of agriculture grew along with the demand from farmers for access to the latest technology and scientific developments. These demands outpaced the supply of and availability of university professors and scientists so, in response, the land-grant university system created a formal arm dedicated to conducting outreach education with the passage of the 1914 Smith-Lever Act (McDowell, 2003), which officially created the Cooperative Extension Service. What is important to note is that both home economics and agriculture were grounded in a parallel scientific discipline. The goal was to increase variables with highly measurable metrics, including reduced illness from foodborne pathogens and increased crop yields. Youth

development efforts were slightly different and were focused on providing experiential opportunities for youth skill-building and leadership. The metric, in that case, was the experience offered versus a measured output. The credibility of 4-H and Youth Development is firmly grounded in the positive experiences that youth have and the adults who observe and appreciate the value-added by those experiences. This is an important distinction with ontological, epistemological, and methodological implications even today.

Throughout the 1900s, Extension also played a role in community development and organizing, particularly in rural areas. The great depression in the 1930s deeply impacted how Extension worked in rural communities because people were less interested in production and more interested in financial survival. Due to lack of funding for professional positions, Extension turned to local rural volunteers to help deliver education and outreach. As a result, a tradition of Extension promotion of rural leadership development was born. During the Great Depression, Extension worked in rural communities to organize farm cooperatives and generate forums on economics, encouraging local leadership and civic engagement. "Cooperative Extension became the single federal agency having a direct educational link with rural America" (Seevers & Graham, 2012, p. 37). This special relationship between Extension and community leadership development, particularly in rural areas continues today in the area of Community Vitality and Community Resource Development. This role was formalized in 1993 when the USDA "declared community development to be a priority for programming emphasis" (Seevers & Graham, 2012, p. 92). In Minnesota, while Community Vitality does have an Extension educator in the Minneapolis-St. Paul seven-county metro area, historically as an Extension center it has focused on encouraging the leadership, vibrancy, and economics of small towns in rural Minnesota. Community Vitality's credibility has historically been rooted in the value that small towns find in their partnerships with and quality of education offered by the Community Vitality Center.

While natural resources, such as soil, water, air, have always been connected to agricultural work, the 1924 Federal Clarke-McNary Act provided funding for the first forestry Extension program in Minnesota. The funding was managed by the U.S. Forest Service, and the focus of the initial work was establishing farm windbreaks, which involved planting trees around farms to protect farmland from erosion. The 1970s saw a large increase in environmental programming in Extension, expanding much of the work previously done around integrated pest management and soil conservation (Abraham, 1986). The area of natural resources as a separate content area to agriculture grew with a renewed focus on the environment and the role of individual decision-making to promote and protect soil and water quality. While natural resources' ontology is different from traditional agricultural science, the epistemologies and methodologies of the two content areas are often quite similar in that, as participants learn new information, they change their behavior, and that knowledge gain and behavior change can be measured.

This ontological, historical backdrop provides critical context for exploring the epistemological and methodological underpinnings of Extension content areas and their relevance to credible evidence. Several characteristics have long been core to Extension. These include converting science-based knowledge to be accessible to everyday citizens; teaching practical, useful skills that matter to learners; and engaging citizens to be change agents in enhancing their own quality of life. However, these core features are the very things that pose the greatest challenges in meeting the bar set by the university-based academy for rigorous, valid evidence. When working in communities, it is a challenge to incorporate precision, to maintain simple and explicit objectives, to stay time-bound, and to adhere to structured and systematic processes, all of which are critical in pursuing credible and actionable evidence from a traditional academic perspective. In light of this challenge, the following represent the core discussion areas underscored by key informants when discussing Extension and credible, actionable evidence.

Key Informant Interviews Core Discussion Areas

Content (the What) and the Process (the How) of Extension Education Across Programs

A subtle, but critical difference directly connected to credible and actionable evidence was where program areas stand on the continuum of evidence from content (the "what") to process (the "how"). Informants across program areas independently articulated credible evidence at the core of their work. The Agricultural informants stated that their credible evidence focus was on the "what" (i.e., the specific research and scientific evidence and knowledge about their diverse topic areas).

On the other hand, a Community Vitality informant led our conversation with a statement, "Our center cares about the 'how,' not the 'what'." For Community Vitality, the "how" is mobilizing diverse, engaged members of the community through a well-designed, research-based process to facilitate the development and implementation of a shared solution. The Community Vitality program participants themselves work through a collective process to identify the issue of importance (the "what") for the community.

Similarly, 4-H Youth Development also directs its credible evidence energy towards the "how." The primary focus for 4-H Youth Development Extension educators is developing young people and, as a result, their research focus is on the effectiveness of the learning setting to develop youth leadership, citizenship, and mastery. The positive youth development philosophy of *youth voice* means the youth choose what to learn. While 4-H relies on existing research across relevant discipline areas, such as science, technology, engineering, and math (STEM), to support youth learning, a 4-H Youth Development informant noted that the exact science of the content is less important than the positive development of young people.

The results from the key informant interviews indicated that Family Development and Natural Resources and Environment were similar in that their evidence needs lie in the critical

intersection between the "what" and the "how." In essence, the educational process in these areas is directly tied to the content being taught (e.g., nutrition, parenting in Family Development, or invasive species detection, forest restoration in Natural Resources and Environment). There is equal weight given to both content and process relative to establishing credible, actionable evidence. Post-hoc exploration of why these two program areas shared this feature unearthed one common factor that set these programs apart from other program areas, the fact that both Family Development and Natural Resources and Environment are largely grant funded. It should not come as a surprise that the credible and actionable evidence needed to convince funders is qualitatively different from evidence needs considered essential by other constituents.

Interestingly, where the program areas stand on the continuum of evidence from content to process was directly tied to their discussions of challenges and shortcomings. For example, an Agriculture informant noted that: "In our program area, our strength is our research base. Our challenge is the educational methodology. How do people learn?" A 4-H Youth Development informant noted:

> What we don't do well, or what we don't have at times is a solid scientific base for our work, and sometimes that makes it difficult for us to obtain grants from places like NSF that require certain requirements for evidence.

Connection to Tenured Faculty

The critical role that tenured faculty with Extension appointments play in building credible and actionable evidence cannot be overstated, based on the feedback from the key informants. In fact, they named no fewer than fifteen campus departments housing tenure-track faculty with Extension appointments. The role of Extension-appointed faculty members is to contribute discipline-based knowledge and research to support Extension work. In some cases, the "how" to deliver research-based knowledge to clientele and communities is delegated to county-level Extension educators. In other cases, campus faculty and Extension educators work hand-in-hand to deliver the education and study its impact. There was general agreement across the key informants that some of the best efforts they have seen in Extension are when campus faculty and Extension educators are able to work closely together on all aspects of program development and dissemination, from research to practice to evaluation.

Whether there is causality cannot be determined by this study, but what is clearly evident is the direct correlation between the level of academic faculty support and the program's position on the continuum between content and process. It is not surprising then that Agriculture leads the programs in terms of their direct connection to campus specialists. Family Development and Natural Resources and Environment followed with faculty-led studies that build evidence of specific educational curricula or partnering with Extension educators on research grants. Community Vitality, the newest Extension unit, started with strategic connections to two

academic departments. 4-H Youth Development was the only program area that has not had a departmental home or tenured faculty connected to their program. They do have loose ties to the Youth Studies Program within the School of Social Work but do not have a formal connection at the time of this article.

In Minnesota, Community Vitality's origin story offers a clear example of the important relationship between the credible and actionable evidence built by campus faculty and subsequent Extension programming. As noted in the earlier historical overview, community development has always been important to Extension. However, it was not until 2001 when University of Minnesota Extension formalized the work around community development. The Center for Community Vitality was established to put structures around what had until then largely been a philosophical or value agreement in Extension that "yes, we are all for community development!" Through a strategic planning process, the formalized Center for Community Vitality agreed on offering Extension programming around three core content areas, including community leadership, community economics, and diversity and inclusion. Prior to 2001, Extension provided some funding to two academic departments, the University of Minnesota School of Public Affairs and the Department of Applied Economics, to develop a research base and educational strategies for Extension community development efforts. The School of Public Affairs had developed a robust, research-based community leadership development model and public participation processes. The early efforts for the Center for Community Vitality focused on taking these complex models and processes developed by campus faculty and applying the knowledge and processes in the communities. It was becoming clear during this critical time that diversity and inclusion could not be sustained as part of their program area. A Community Vitality informant noted, "We realized that diversity and inclusion was a passion area and, at the time, it did not have a solid grounding in education and scholarship. It was difficult, but we learned that you can't run a sustainable Extension program on passion."

Realities of Extension Work

Scientific rigor in building credible evidence requires precision, ideal conditions, and holding key study constructs constant. At times, balancing and maintaining these priorities is a challenge for Extension. As a Family Development key informant stated: "Evidence we build becomes obsolete almost as soon as we build it. People change. Conditions change. The world changes. The context of how families carry out their lives and their realities are constantly shifting."

An Agriculture informant further noted:

> In Extension, while we need to bring the science from natural sciences to bear on significant issues important to the ag economy and the environment, we also have to be ready to respond to critical, real-time issues. Hail or natural disasters, for example. Farmers need to know what to do now. We can't sit and wait on the research. The pressure on research is a deeper level of science, but it doesn't allow you to address more

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> of the immediate needs. In those times, the Extension educator plays a significant role. The local educator has to be credible to address real-time issues. That is the reality of the situation.

Research also has to be translated to people who are not scientists. The challenge becomes controlling the message and ensuring that the Extension educational message is interpreted and used in a way it is intended. The informants discussed the reality of Extension work in the context of competing messages and in the midst of an information age where there is a "great amount of misinformation in the general public." As one informant noted:

> We peddle in education. And getting through to someone with a concept so that it may change their lives and their environment is the core of our work. But we are competing in our messaging with giants in the industries and also people's prior knowledge and experiences.

These realities mean Extension credibility lies with the educators. The key informants emphasized that to be credible does not always mean research, but it does always mean that the messenger must be believable and trusted. Characteristics that informants noted were critical included, first and foremost, being confident with the content, but additionally being dynamic, good with people, fun, positive, optimistic, intelligent, self-motivated and a good team player. As one informant noted:

> You need a unique personality to be in Extension. You need to be able to take complex concepts, make it meaningful to citizens, and apply the concepts uniquely to differing situations and contexts. And you have to be good with people, so they trust you. Only certain people are good at that. If this is their niche, then they stay.

However, above it all, there is a sense among the key informants that Extension education has long-term consequences and that the credibility of both the science and the educator, and the quality of the interaction between these two constructs, matter a great deal in the community. One informant summed up this sobering reality for all our program areas: "We have to live with the consequences of education for a long time. We need to be accurate. It is people's livelihood."

Who Does Extension Need to Convince Regarding Credible and Actionable Evidence? What Data Convince?

Given the above discussion by key informants, it should not come as a surprise that there was general agreement across the program areas that the most important constituents Extension must convince regarding credible and actionable evidence are our own staff and volunteers. Convincing our staff of the research evidence of our content as well as specific strategies for

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effectively disseminating the knowledge to make a difference leads to effective Extension education as well as staff retention. As one informant noted:

> Our staff and volunteers, to continue to live out our program, must come to realize, accept, or believe that we are truly making a difference. Really good Extension work needs heart and passion and that collectively, we make a difference. Ultimately, that is [those] who stay in Extension, those who believe that.

Another informant noted, "Our staff have to believe the evidence. This belief and the skill set to take the research base to form recommendations and figure out how the information can be tailored to help under unique situations of participants."

Another important set of constituents who need to be convinced that our evidence is relevant and consequential are participants of our education and programs. There was substantial agreement across informants that the evidence that sways our participants are things they can see and hear in real time. In Agriculture, it might be test plots that show improvements in crop growth. In 4-H, it might be a shy, young person presenting in public at the fair or leading a meeting of their peers. In Family Development, it may be a parent sharing with other parents about the benefits of communicating differently with their teenage children. No matter the program area, key informants noted that the evidence that convinces program participants are things people can see and experience for themselves.

A relevant example of offering real-time evidence is 4-H Youth Development. Most informants, including a Youth Development informant, agreed that Youth Development has the least foundation in a research base and the least amount of what might be considered credible evidence by the university academy. However, other program area leaders also acknowledged that, when push comes to shove, "4-H wins - always!" Why is that? The evidence of 4-H Youth Development's impact is immediate. Key constituents, including youth, their parents, and community members, get to see the value every time they connect with the program. Youth are connected to the program over a longer time span, sometimes over years, so they personally see growth, change, and building of evidence over time and the general feeling of goodwill towards the 4-H program lingers into adulthood. So, for 4-H, its greatest evidence of effectiveness is retention. The youth continue to come, parents continue to support, and community members continue to invest in the program as volunteers and donors.

Interestingly, Community Vitality, the other center that focuses evidence on the "how" also understood that long-term solutions require long-term engagement. Yet they noted their greatest challenge is getting communities to buy into long-term engagement, even though that is what is often needed to show evidence of effectiveness and impact.

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Given that, for our program constituents, credible evidence lies where they can observe change, this reality changes how we might go about gathering relevant, consequential evidence. A faculty specialist and Family Development informant discussed the journey she has taken:

> My experience in our field about credible evidence and what actually is evidence has shifted to a focus on where we can observe change. I used to focus on quantitative data collection, maybe through pre-post assessments. But I found when we can actually observe change, for example, how people are communicating differently, a specific change along a trajectory, that parents can tell stories to each other, and they are learning how others are changing …, I am understanding that is convincing evidence. Now I am doing this (gathering stories) that I wasn't doing before. Stories of people are credible evidence. We cannot shortchange this.

Finally, no conversation about who needs to be convinced about the credibility of Extension's programs can be complete without discussing funders. As state- and federally-funded institutions, maintaining Extension's credibility with its participants and the legislative bodies that represent them, is certainly a key feature of Extension's longevity. However, programs funded by grants often have their own unique set of required metrics in order to be determined as credible and worthy of funding. For example, the Center for Family Development receives two major nutrition education grants, the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program - Education (SNAP-ED). Both of these programs require detailed accountability and monitoring systems that include documenting whether participants are achieving targeted behavioral outcomes. These grants allow for the development of robust evaluation systems, setting them apart from what a non-grant funded program's evaluation might look like. It might be surprising to see what evidence might emerge if similar specific funding was set aside at the state and federal levels for evaluation of other Extension programs.

Reasonableness in Building Credible Evidence

A rhetorical, yet critical question was brought up by several informants: "When is enough really enough when it comes to credible and actionable evidence?" Extension has built and honed effective educational and programmatic practices over the years through a wide range of programmatic contexts. Extension educators are skilled at tailoring education to meet the changing needs of learners. Through reflective practice and critical thinking opportunities, educators share their best practices and strategies with other colleagues and community partners. The question being asked is: "Can we reasonably proceed in programming under the precedent that if educators do their jobs well, that expected results can be assumed?". For example, a Community Vitality informant noted:

> We know some things. Our model of bringing interested people together to solve issues they are interested in is inherently good. Plus, we have 15 years of evidence that we

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> increased the degree of participants' leadership. We know this. Couldn't we stop that and spend time studying something more meaningful?

In Natural Resources and Environment, an informant discussed how the Kaplan Reasonable Person Model (Kaplan & Kaplan, 2003) undergirds their work with volunteer naturalists. The Kaplan model assumes that people are more reasonable, cooperative, helpful, and satisfied when the environment supports their basic information needs. So, a lot of up-front work is surveying the audience, empathizing with participants about how and what they want to learn (the Reasonable Person Model). In terms of volunteers, there is a belief that as a reasonable person, if they get certain knowledge and skills they deem important to them, they will take that knowledge and act reasonably to do good. However, the informant did acknowledge:

> We want to work more closely with the kinds of metrics that actually convert to impact on the ecosystem. Also, if we can assign volunteers in surgically meaningful positions, with a strong designated volunteer model, and using volunteers more effectively, we may save regulatory dollars and may be more impactful.

Another informant summed up the "when is enough, enough" dilemma this way:

> There are lots of moving parts in our work, and we often work in contexts without clear answers or credible processes. We can't be rigorous and credible with everything. So again, at the end of the day, educators have to be credible.

The Role of Grants in Building Credible and Actionable Evidence

There was agreement across program areas that grants are instrumental for building credible and actionable evidence in Extension. Lessons learned as well as products and strategies that get developed through grants are often transferred to Extension's everyday work. One program leader discussed how he/she improved the gathering of credible and actionable evidence through a grant:

> It is easy to see the need for understanding about program impacts. It is hard to sell understanding for program improvements. So, we went after grants to study that. This one grant brought in cool evaluation specialists as consultants and thought leaders to help us think about how what we do matters. They helped us get theories into tools to evaluate and developing a data system to quickly track complex efforts. Now, we can describe what we do, our impacts, and most importantly, why it works. It is really surprising how credible evidence supports credibility of our efforts. People buy in, including staff, as they begin to see the benefit.

Other informants also discussed how they use grants to explore evidence where they experience challenges. For example, an Agriculture informant, recognizing that the agriculture program is relatively weak on understanding educational methodology, obtained a grant to work with a

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multidisciplinary team to address it. A 4-H Youth Development informant also discussed how that program is able to capitalize on opportunities to study and leverage practice through grants like CYFAR. In Family Development, grants are the gateways to studying educational processes and impacts for new and diverse audiences, testing different educational models, and building data collection systems that can contribute to their ability to build, use and publish around credible and actionable evidence.

Lessons Learned Across Extension Program Areas and Implications for Extension

When we started this project, we expected to find some common type or metric of credible or actionable evidence that some program areas were better at collecting and, potentially, some areas of growth for particular program areas. Instead, what we found is that each program area is thriving in terms of the credible and actionable evidence that is valued by their unique stakeholders. Ranging from youth development, with generations of 4-H volunteers and participants experiencing and observing programmatic impacts every day, to farmers actually seeing their income grow through innovative farming strategies learned from a local Extension educator. Each program area has data, stories, and a research base satisfying their unique group of stakeholders. Evidence, research, and the scientific method matters, and each discipline is informed by emergent data from affiliated academic fields. However, across centers, science looks and is enacted differently. What is common across centers is a need to translate science into practice and communicating with stakeholders. Thus, sharing evidence as well as strategies for gathering evidence relative to effective educational practices across program areas may be a useful endeavor for building credible and actionable evidence in Extension. As alluded to earlier in the article, Minnesota Extension built a mechanism for sharing across centers with ongoing meetings of center-based evaluation and program development specialists. Based on these experiences as well as findings from the informal interviews with program leaders, we offer the following recommendations for building credible and actionable evidence in Extension.

Resources for Building Credible and Actionable Evidence

As noted by the key informants, despite its diverse content areas, one thing common across Extension is the fact that Extension professionals work with people. Therefore, a common area that all program areas could explore is related to the practice of our work. What we often lack is a complex, dynamic system that collectively supports documenting and evaluating how we work with people and what strategies are effective and ineffective, documenting process evidence across programs, and explicitly supporting ways to share innovation and evidence with each other in real time. This includes exploring and understanding how research and practice evidence is interpreted by stakeholders. There is a need for common ways of documenting and sharing the practice of our work with community stakeholders in order to develop an evidence-base of effective strategies. As educators deliver programming to new audiences and within different contexts, the need for resources to build credible and actionable evidence on how to do that work effectively becomes ever more critical.

Additionally, across all programs, there is a need for a clear understanding and capacity for strategic program development and design that allow for real-time decision-making. Using good evaluation practice and data-informed decision-making when designing programs is critical. The Minnesota Extension SNAP-Ed program offers a good example of what is possible when an investment is made in a robust data system. SNAP-Ed grant funds allowed for the development of an evaluation and program management system that is utilized to continuously improve practice in real time. The management system is a relational data system with a capability to connect data across participants, geography, educator, agency partners, curriculum, and time. This system can answer simple questions like:

- Which educators have used a specific curriculum over the past three years?
- How many schools in a region of the state are part of SNAP-Ed?
- Which partners are working together in a community on a specific project?
- What proportion of participants has taken more than one course from SNAP-Ed?
- What are the most popular improvement oriented actions taken by multi-sector collaborations?

Additionally, the system can answer complex questions such as: "What are the interaction effects of multiple programmatic strategies (such as a combination of direct education and environmental changes) on participant behavior change outcomes?".

The SNAP-Ed data can also be connected to large-scale census or public health data, so programming needs, staffing, and whether a specific curriculum (or interactions of program components) works across geography or participant characteristics to promote program goals and outcomes can be determined in real time. Needless to say, Extension as a whole would be well-served with the resources to build such a system that can be effectively and consistently applied across program areas.

Staff Development

Perhaps the biggest takeaway is that the program leaders in this study believe that credible evidence resides with our staff rather than with data. To meet emergent needs, to address complexity, to make sound judgments in real-time amidst rapidly changing environments, our staff have to be knowledgeable and confident about the evidence behind both the content and the process. It follows then that Extension educators must have a continuous relationship with credible research and a deep understanding of the research behind their messaging. Extension educators must be able to answer the question of what is cutting edge in terms of their content and process. To act as effective interpreters, they need a regular connection to scholars exploring the content of interest as well as a willingness and an interest in continuously learning about what the research community is producing. Extension educators need support to craft and test out their messaging, to share what they learned, and to continuously hone their skills.

Needs Assessment

In all the focus on credible and actionable evidence, and in terms of data needs, the program leader informants expressed that what is most critical may be more robust needs assessments to understand the learning needs and contexts of our Extension program participants. As two program leader informants shared:

> At the end of the day, we want to connect with people. What will make people connect with us? So how do we learn what they value and what they see is value? We have to figure out how we contribute to their lives. Do we have something to offer? Could we contribute to meet their goals?
>
> Our bread and butter is people. We have to understand the learning wishes of our priority audiences. Then we need to feed that knowledge into our planning process. . . . Then figure out within the resources we have right now, what can we do right now to address specific learning wishes of our audiences?

When exploring credible and actionable evidence in Extension, we should be asking: "Are we giving people something of value?" and "Are we helping them meet their needs in ways they can see and find value?".

Engaging Citizens to Play a Role in Crafting and Using Research Knowledge

No matter our programs' impact areas, whether it is healthy and thriving youth, families, communities, agricultural economy or the environment, according to our program leader informants, the common denominator of Extension is people. Given the growing awareness by land-grant universities that technical solutions are not enough to solve complex problems, the University of Minnesota has advanced Grand Challenges priorities that call for reciprocal partnerships with communities to explore research and local impacts. This means we need people, both Extension program staff and program participants, to engage with research and program evidence critically and reflectively. Critical thinking, critical data consumption, and evidence-based decision-making is not just the purview of the expert, it is in everyone's interest to build this skill set.

Explicit strategies are needed for Extension program participants to engage with research and data so they can become agents of change in their own lives. An innovative solution might lie in Minnesota Extension's Natural Resources and Environment program area, where they have developed a platform for developing citizen scientists in the content area of aquatic species management and documenting numbers of at-risk species, such as pollinators. What would it look like to develop citizen scientists across all program areas, from leadership to soil quality to parenting to healthy food access and beyond? The next step in the land-grant mission of democratizing high-level community education may be to revisit Extension's historic charge to

"rouse the people of the land" (Herrera & Hoelting, 2010; Peters, 2002) to organize solutions that are driven by those who are most affected by it. This can only happen if we teach and train in not just content, but also critical thinking, critical data consumption, data-informed decision-making, and direct engagement with science. If Extension embraces this as a core, common goal, then a next logical step would be to evaluate Extension programming with metrics such as changes in individual or community-level efficacy to address issues and concerns about which they care. Other potential outcomes would be increases in citizen involvement and community-led work with indicators like volunteering, coalition formation and membership, and community-led projects.

Limitations

The limitations of this work include its methodology, which describes a particular Extension context and is not intended to describe broader patterns or represent empirical data. Evaluation specialists and content-based program leaders have unique perspectives that may not be representative of all Extension staff. Therefore, any conclusions, recommendations, or suggestions must be considered with this limitation in mind.

Conclusion

When asking the question about what is credible and actionable evidence across Extension program areas, the answer is: That depends on the people and stakeholders Extension serves. What is common is that every Extension educator wants to have a positive impact on how people lead quality lives; however, those people determine quality. A critical step for Extension is to work towards building capacity and developing resources to create a science of delivery and implementation regardless of content area. Extension works with whole people, families, communities, and is as interconnected and interdependent as the people and communities it serves. Yet Extension's efforts are too often siloed and restricted to specific content areas. No matter the impact of Extension programs, whether it be healthy and thriving youth, families, communities, agricultural economy or the environment, the common denominator of Extension efforts is people. Extension must democratize critical thinking and data-informed decision-making and partner with communities to study and create the solutions to problems they identify as being priorities. Ultimately, that is how Extension develops a broad base of credible and actionable evidence.

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