

# Using the Logic Model to Plan Extension and Outreach Program Development and Scholarship

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## Abstract

In searching for a process to help program teams of campus-based faculty and field-based educators develop five-year and annual statewide program plans, cooperative extension administrators and specialists in Penn State's College of Agricultural Sciences discovered that the use of the logic model process can influence the successful design of specific programs as well as outreach scholarship. The team and logic model processes that were employed have helped educators identify goals, articulate measurable impacts, and evaluate their programs, resulting in both incremental and substantial organizational change. This article illustrates how the logic model process is an organizational and leadership tool. The authors share their perspectives on the logic model process, implementation strategies, and the benefits of developing a community of learners to enhance outreach.

## Introduction

Penn State Cooperative Extension's new model for statewide program planning and implementation is grounded in the logic model process. The logic model process is an organizational and leadership tool that can lead to influencing and strengthening outreach scholarship. Perspectives on the logic model process, strategies for implementation, and the benefits of developing a community of learners are shared in this article.

## Extension Program Planning Process in Pennsylvania

Penn State Cooperative Extension in the College of Agricultural Sciences develops five-year and annual plans of work, as do other cooperative extension organizations in land-grant institutions across the country. Our new plans of work (POW) cycle in Pennsylvania began on October 1, 2004. As we considered how we had conducted program planning in the past,

a need was identified for a rational unifying process to help program teams led by campus-based faculty and field-based extension educators develop statewide plans of work. A process was needed that would help these POW teams identify an overall goal, articulate measurable impacts (short-term and long-term) for specific audiences, develop activities to accomplish those impacts, evaluate the impacts, and begin to think about highlighting success stories.

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In addition to a rational unifying process, we were interested in engaging the POW teams in a process driven by them and not by the administration. It was desirable to create an environment that encouraged organizational buy-in, shared leadership, and team decision making. We wanted the teams to form a community of learners that built on previous plans of work while developing more focused programs with our limited resources, plans consistent with the extension and research priori-

ties in the college. Organizationally, we also needed a way to ascertain how programmatic activities addressed stakeholder-identified needs in a cohesive manner. We wanted to demonstrate how educational activities tie to desired impacts and how measured impacts could reasonably be attributed to activities conducted by educators.

Outreach scholarship is an integral component of each of Boyer’s functions of discovery, integration, application, and education as outlined in the UniSCOPE 2000 report (*UniSCOPE Learning Community 2000*), particularly of the latter three. The multidimensional UniSCOPE model conceptualizes the teaching, research, and service missions of the university as a continuum of scholarship. The cooperative extension organization, with its historic links to communities and individuals in each county across the state, offers an ideal model for strengthening the integration, application, and education functions of outreach scholarship. We envisioned the team process and the logic model process—involving both campus-based faculty and field-based educators—further strengthening scholarship in the field, while continuously informing the research community of current and emerging needs of our clients.

## The Logic Model Process

The attempt to specify the logic of a program dates to the 1960s and 1970s when evaluators needed a mechanism to measure the value and impact of governmental social programs. Evaluators found that programs and measures of outcomes or impacts did not always correspond to program objectives, resulting in what were considered muddled evaluations and, consequently, disappointed stakeholders (Smith 1989; Mayeske and Lambur 2001). The logic model process established itself under the influence of Wholey as a preliminary step to evaluation (Wholey 1979).

Later during the 1980s extension evaluators in cooperative extension concluded that the logic model process had at least three benefits. It could be used, first, “to plan a plausible, evaluable program” (Smith 1989, 143); second, “to produce a consensus among the workgroup members” about program goals, delivery, and evaluation (p. xv), because it is a “staff-centered approach”; and third, to reveal the degree of stakeholder awareness and interest in the program (Smith 1989). By 2000, the University of Wisconsin was promoting the use of the logic model for extension program development, and in time other cooperative extension organizations across the country began to value its use (Arnold 2002).

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Scholars reason that a logic model defines the program theory or the set of explicitly defined assumptions about the “cause and effect relationships and thus provides the rationale” among the resources, activities, and impacts in a program (Bickman 1987, 5). Knowledge of the program’s theory can assist programmers in determining whether poor program impact is a result of theory failure or program failure, that is, of the program’s not being conducted the way it was proposed (Suchman 1967; Weiss 1988).

The use of the logic model process was advanced in September 2002, when the United States’ General Accounting Office released a report to congressional committees titled

*Program Evaluation: Strategies for Assessing How Information Dissemination Contributes to Agency Goals* (GAO 2002). This report emphasized using a program logic model as a way to define a program's goals in addition to describing a program's components, impact, and evaluation. This reference to the logic model by the GAO publication raised the visibility and the credibility of such an approach.

### What Is a Logic Model?

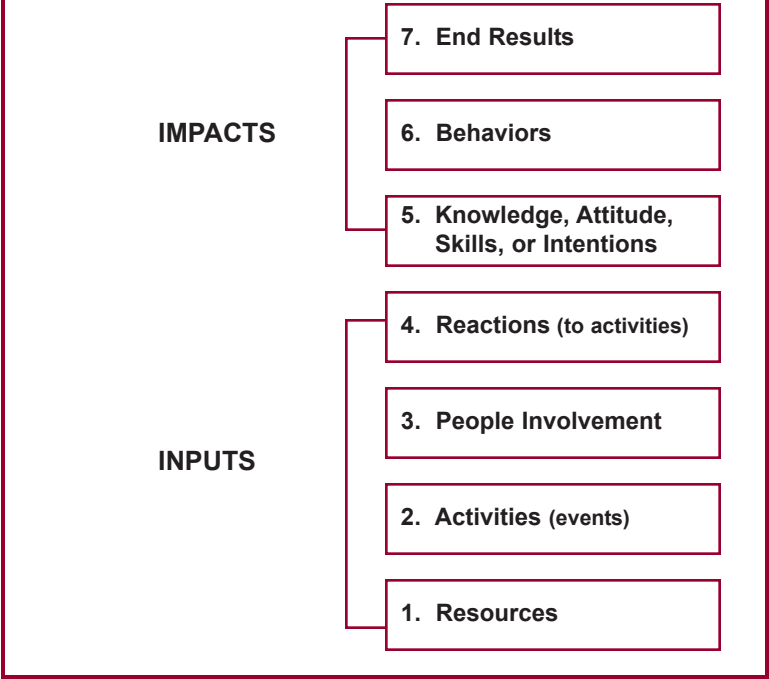
A logic model identifies explicitly the components of a program, beginning with the expected impact and following with the resources, activities, and target audience participation, in order to determine the plausibility of the program in achieving the impact. If the program is not plausible or logical, that is, if a certain component will not lead logically to the next component in the model, then one or more of the components will need to be redefined to yield a logical expectation of impact.

#### ***Program development and a logic model for Pennsylvania:***

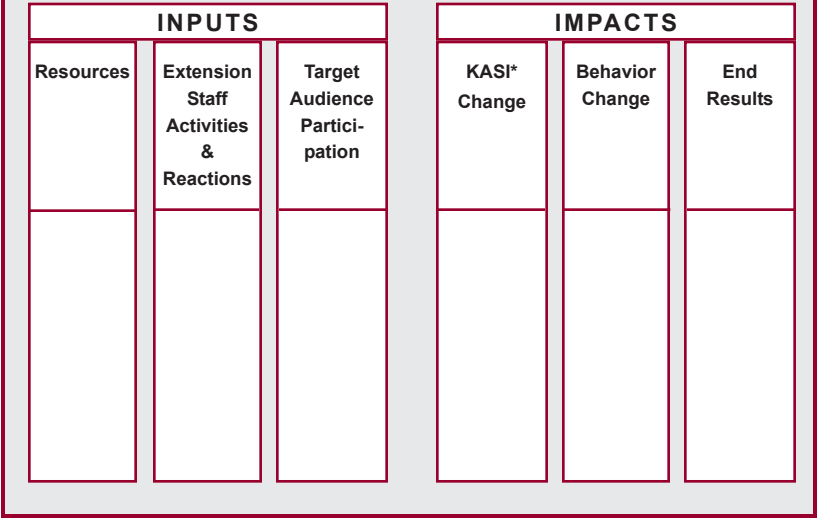
Most scholars point to the basic components of a program—its resources, activities, target audience, and impact—when discussing program development. However, cooperative extension throughout the United States adopted Bennett's (*USDA 1979*) program model in the 1970s. Bennett contributed significantly because his model defined six types of impact: changes in knowledge, attitude, skills, intentions (aspiration), behavior, and end results (see figure 1). His model assumes that extension resources, extension activities, and target audience participation will lead to the different types of impacts and, ultimately, the end results. Resources, activities, and target audience participation are not perceived or measured as impact (see figure 2).

The program theory underlying Bennett's model has some limitations for extension, however. Many extension programs are more complex and do not fit a simple logic model like Bennett's. We created a logic model to embrace complex stages of impact that can occur over a period of time or through community groups. For example, our expanded logic model represents not only extension's work with tobacco and health coalitions but the work that the coalitions perform in the community, such as recruiting and educating their members and conducting assessments and programs (see figure 3). The expanded logic model can represent train-the-trainer programs. In phase one of such

**Figure 1: Components of a Program Identified by Bennett**



**Figure 2: Simple Logic Model Integrating Bennett's Types of Impacts**



**Figure 3: Expanded Logic Model Integrating Bennett's Types of Impact and Multiple Stages of Impact Over Time**

INPUTS			Immediate Impacts		Intermediate Impacts		Extended Impacts
Resources	Extension Staff Activities	Target Audience(s) Participation	KASI*	Behavior	KASI*	Behavior	Impacts (on the problem/opportunity)

Problem/  
Opportunity

Data Sources and  
Indicators:

**External Influences:**

On volunteers or coalition:  
On clients:

**Assumptions:**

Test assumptions of the logic in the program: by making IF THEN statements about components in the model.

programs, extension personnel conduct educational activities for target audiences such as 4-H volunteers and Master Gardeners, and the work by extension is not considered impact. However, in phase two of these programs, the community groups garner resources and conduct educational activities for the participation of other target audiences, and these behaviors are now conceptualized as impact.

**Case study I:** In the Breast Cancer Screening Recruitment program in a very rural county, extension provided an educational program for a community Breast Cancer Subcommittee, local community organizations, and businesses representatives that serve uninsured and underinsured women. As a result of those extension activities, these community groups will teach, counsel, and inspire women in the target audience to take preventive steps against breast cancer. Even though the community groups' behavior consists of typical extension-like activities, these activities, because they are done by the community groups, are considered the first or immediate stage of extension impact and can be measured. (The logic model is detailed in *Bencivenga 2003*.) As a result of the community groups' activities, the target women, the uninsured and underinsured, will schedule screenings, keep appointments, and bring a friend and family member to a learning lunch. These behaviors by these targeted women constitute the second or intermediate stage of extension impact and can be measured later. As the logic model demonstrates, the first and second stages of extension impact lead to the final or extended impact, increased screening at designated sites in a county, increased early-state diagnosis of breast cancer, and reduced death rates.

An expanded logic model is appropriate for other types of programs as well, programs where the impacts of an individual or a group take time to occur but require a series of recognizable steps to achieve the impact.

**Case study II:** In the Agricultural Entrepreneurship program, extension conducted educational activities for agricultural producers looking at alternative agricultural opportunities that could result in increased income over time. As a result of the extension activities, the producers will discuss business ideas with partners and similar entrepreneurs, conduct analysis, and initiate the development of a business and a marketing plan. As the logic model demonstrates (*Kiernan, Corbin, and Watson 2003*), these behaviors by the producers constitute the first or immediate stage of extension impact and can be measured. Completing a business and marketing plan, evaluating competition, and securing business expertise constitute a second or intermediate stage of extension impact, because these behaviors take place over time and are dependent on the completion of those in the first stage. Additionally, these behaviors can be measured. The first and second stages of impact lead to a final, extended impact, use of the various plans

to make decisions and eventually increase income. This expanded logic model encompasses impacts that take place in recognizable steps over time.

A logic model that links all of the steps that ultimately lead to the extended impact ensures a logical connection between all sequential steps; moreover, it provides the opportunity for extension to evaluate the intervening impacts as well as the final impact. Thus the expanded logic model adopted in Pennsylvania allows extension to plan to evaluate a broader array of impacts than the program's original design encompasses.

### **Penn State Cooperative Extension's Experience**

Influenced by their experiences using the logic model process informally with faculty and for an education program for a statewide in-service for field-based educators, the program leaders considered integrating the process into the next cycle of the state program plans of work. Concurrently, a new Web-based statewide planning and reporting system was under development—the College of Agricultural Sciences Planning and Reporting system (CASPAR). After thoughtful discussions and consideration, the program leaders and others involved in development of the Web-based system incorporated the components of the logic model into the CASPAR system. The next step involved establishing the POW teams to develop the new plans of work using the logic model process to guide their planning and implementation efforts.

***Engaging teams and outlining leadership expectations:*** The aim of Penn State Cooperative Extension was to engage both campus-based and field-based educators in programmatic leadership roles as cochairs and team members for the next cycle of the state program plans of work. The process began with the identification of cochairs—one campus-based faculty member and one field-based educator—for each POW issue, followed by the formation of POW issue teams to address seventeen broad issue areas. The POW issue areas were determined through an assessment of statewide needs and of the corresponding resources, expertise, and strategic priorities of the college.

We invited the team cochairs to attend a work session to identify statewide programming efforts related to the plans of work in the fall of 2003. The purpose of the session was to outline cochair responsibilities and team expectations, introduce the logic model process, and build team leadership skills. Team expectations and



cochair responsibilities were set forth. Cochair responsibilities included building functioning teams, providing the leadership required to focus team efforts, providing leadership opportunities for team members, and facilitating communications among the educators and with the administration—the state program leaders, the field-based regional directors, and the academic unit heads. We expected the cochairs to develop teams with well-rounded expertise needed to direct the programs, with team membership inclusive and participation self-selecting. Training on the logic model process was offered to all of the cochairs of the POW issue teams at the session, and they were expected to develop a logic model for their respective issue areas.

After the POW issue teams were established, a second work session was organized to provide an opportunity for the teams to begin their efforts. The cochairs were responsible for providing leadership to the teams and guiding the teams in the clear identification of key program topics with achievable impacts, as well as helping the teams develop evaluation strategies to measure impact of the programs. We expected the teams to actively participate in the development, marketing, implementation, and evaluation of statewide programs and provide leadership to our statewide programming efforts in their particular area, including the identification of programs and in-service training needs.

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The work sessions for the cochairs and the POW issue teams provided an opportunity for team members to become familiar with and to use the expanded logic model. The logic model process enabled the teams to develop plans of work with features common to programs across the system. For example, we were seeking uniformity in the description of the components of the programs and specificity in the plans to ensure that programs are developed to meet goals and that evaluations are conducted using selected indicators to measure program impacts. Additionally, we wanted to develop ways for the teams to share their ideas within subject areas and across disciplines in the organization. Finally, we encouraged the cochairs to facilitate internal team communication, and to periodically communicate to the teams and to the administration progress made and obstacles encountered in their teams' efforts.

These work sessions were strategies to give the POW cochairs and teams a framework for program planning and development, as well as to increase knowledge and skills in using the logic model. The work sessions were also used to boost commitment in developing the next POW cycle. In essence, we were using the logic model to inspire new perspectives and behaviors that would allow the teams to take steps in shaping the direction in which the organization must move programmatically.

***Incorporating the logic model into the CASPAR system:*** In conjunction with the development of logic models, each POW issue team was responsible for developing information in their subject areas for the POWs for the new CASPAR planning and reporting system. The teams identified program topics and titles, prepared problem/opportunity statements, identified internal and external program resources, developed indicators to measure impact for each POW issue, and identified evaluation strategies. Each POW team also developed one or more logic models to provide guidance to other educators participating in the plans of work. The logic models were posted on the CASPAR system to help other participants understand the overall goals as well as the problems, resources, educational activities, target audiences, impacts, indicators, and evaluations for each of the issue areas.

We conducted training for field-based educators and campus faculty to help them use the new CASPAR system and begin to establish their individual plans of work. Training across the state also emphasized applications for the logic model process beyond planning for new programs. For example, exercises were created to orient the extension educators to new ways of thinking about the logic model process, including ways to face such challenges as effective evaluation of respected programs and rethinking programs that seemed to have lost their original objectives. While the teams faced challenges in using the logic models to develop plans of work and indicators to evaluate the impact of their programs, the results have been very successful. Some teams developed macro design logic models; others created micro designs that are more specific to individual statewide programs.

***Case study III:*** The efforts of the issue team focused on agro-nomic production provide one example of the value of the logic model process across interdisciplinary areas. The faculty, staff, and extension educators for this issue are located in four departments

in the College of Agricultural Sciences and six regions across the state. While they have accomplished a lot, they often found it difficult to organize and plan effectively for the year ahead, and sometimes they did not accomplish what they had planned. The team found the logic model process to be a useful tool for organizing, planning, and prioritizing their activities to accomplish their goals more effectively.

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This team created six different logic models, one for each key area—integrated pest management (IPM), forage crops, grain crops, nutrient management, soil management, and organic production. They started by thinking about the extended impacts and then determined how they could accomplish these impacts, identifying resources, educational activities, and target audiences. They developed indicators to measure the immediate and intermediate impact

of the activities needed to reach the extended impact: sustainability of agricultural production. As an example, immediate impact will be measured by the number of producers who increased subject knowledge (all program areas) and intermediate impacts (e.g., number of producers who developed nutrient management plans) using interview and observation evaluation methods. The CAS-PAR system provides a structure for collecting this evaluation data so that the team will be able to summarize the statewide impact of their programs at various levels of change.

The logic model process in this case facilitated the development of interdisciplinary teams. They have now formed a crop management extension group (CMEG) for each key area identified: IPM, forage crops, grain crops, and so on. The CMEG members for each of the key areas will develop educational programs that strive to meet the needs of farmers in Pennsylvania. For example, the Nutrient Management Team has been working with farmers and their advisors to develop practical solutions for managing the nutrients from animal manures applied to cropland in the state, most recently focusing on the development of strategies to minimize the effect of phosphorus in the state’s water resources.

This case reflects the organizational change that has occurred as a result of implementing the logic model process in program

planning. The team members have developed of a community of learners across disciplines that will strengthen the integration, application, and education functions of outreach scholarship, and they are organized to work efficiently to address the needs of their stakeholders.

## Implications

Penn State Cooperative Extension has experienced both incremental and substantial organizational change because the logic model was used to design the programs in the statewide plans of work cycle and because this model influenced the design of the new planning and reporting system.

The POW logic models became tools through which extension educators and faculty could communicate the priority of specific extension programs. The logic models were available for all to review, which enhanced organizational learning and innovation, as well as stimulating continuous improvement. For example, one faculty member indicated that the logic models have given educators an opportunity to compare programs, to see how others approach similar situations, and to learn from colleagues.

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We found that using the logic model process encourages dialogue and reflective communication during the program development and implementation phases. Consensus building leads to increased trust and understanding, which improves program planning. Members of the POW issue teams listened to differing ideas, suggestions, and advice, which improved the design of their logic models. While they faced challenges in creating the new logic models because team members had different assumptions and interpretations of their programs, the logic model process became the vehicle to foster high-level thinking, communication, and decision making.

Responses to the use of the logic model from faculty and regional administrators reflect a range of organizational implications. For example, one faculty member indicated that he had

been using the logic model and had not realized it; however, formalizing the process codified his thinking. He found the logic model a better method for bringing a diverse group of people together. He described another benefit: “The beauty of this logic model was that it really wasn’t a static piece of paper . . . you can adjust it or modify it.” Another faculty member stated, “I am attracted to the logic model because I think it is going to be a tool to help us get our heads together and work smarter . . . and more effectively in accomplishing some of the goals of our organization.” A regional director indicated that the logic model process helped the field-based educators look at their programming from different levels of evaluation, making it easier for them to map what could be achieved in one year, two years, or five years.

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She said, “I really like the logic model as I work with educators in the field—it makes sense to them, it helps them plan strategically, but more important, they are focused on the outcome of their programs. I believe in the years to come, we are going to be able to report greater program impacts across a program.”

Program development competency has grown among the extension faculty and field-based educators, as they have a better understanding of how to design and test a new extension program model before implementing it in the field by using the program theory of the logic model. Extension administrators and educators now have a stronger sense of the strategic and programmatic goals of cooperative extension.

The thrust of our effort is to expand the reasons for using the logic model beyond planning for new programs. The logic model is being used for planning educational activities, conferences, and grants and to develop evaluations. For example, the Food Safety Issue Team developed an evaluation tool for educators. Evaluation questions have been developed for each indicator, and educators can determine which questions to use for their specific evaluations. This will allow the team to capture and report statewide data effectively. Additionally, logic models are being shared with extension advisory committee members and other

stakeholders who are able to clearly see the sequential phases of program planning and evaluation.

In conclusion, the logic model process provided a rational unifying process to help the POW program teams develop statewide plans of work by identifying an overall goal, articulating measurable impacts (short-term and long-term) for specific audiences, developing activities to accomplish those impacts, and forming strategies to evaluate the impacts. The process engaged the teams in an approach that is driven by them and not by the administration, a process that encouraged communication, organizational buy-in, shared leadership among faculty and field-based educators, and team decision making. These teams now constitute a community of learners more focused on program goals designed to meet stakeholder-identified needs. We expect that the logic model process will help reshape our thinking about some of the structural challenges now faced by cooperative extension in light of limited resources.

### Acknowledgments

Appreciation is expressed to Shuangyan Li, database administrator, CASPAR project director/manager, and Neal T. Vines, director of information and communication technologies, for their continued leadership and presence in developing CASPAR and balancing the demands of technology and usability. Appreciation is expressed also to David R. Wolfgang, Mary Jo Depp-Nestlerode, and Gregory W. Roth for their leadership and positive support for the logic model.

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### Other resources

- U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. 2001. CDC Evaluation Working Group: Logic model resources. <http://www.cdc.gov/eval/resources.htm#logic%20model>.

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