A Logic Model for Agricultural Literacy Programming

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Introduction

Agriculture provides the very sustenance of life, and without it no society can survive. By 2050 the world's population is projected to reach nine billion people requiring agricultural production to double—with less land and water—while sustaining our planet. This increase in population will require more food to be produced in the next 50 years than the past 10,000 years combined (Borlaug, 2000). Our growing world population relies on agricultural systems to meet the basic needs of food, clothing, and shelter. With only 1% of the U.S. population actively engaged on farms (Central Intelligence Agency, 2013) and 15% in related careers (Goecker, Smith, Smith, & Goetz, 2010), a majority of consumers—youth and adult—do not have a fundamental understanding of agriculture or how it impacts their lives. In addition, as agriculture has become more specialized, even those engaged in agriculture may know little about the resources and other inputs used to produce food, clothing, and shelter outside of their purview. In order to meet the challenges of the future, it is imperative that young people and adults become informed, "agriculturally literate" consumers, advocates, and policy makers regarding agricultural issues.

The current National Research Agenda for Agricultural Education (Doerfert, 2011) established six priorities to address issues in agricultural education. These priorities were informed by a report titled, Science Roadmap of Food and Agriculture (Association of Public and Land-grant Universities Experiment Station Committee on Organization and Policy—Science and Technology Committee, 2010). That report identified eight societal needs that require a basic understanding of agriculture. In an effort to address some of the societal needs, which would result in long-term sustainable basic-needs solutions, Priority 1 of the National Research Agenda suggested research in the area of *Public and Policy Maker Understanding[s] of Agriculture and Natural Resources*. Within the priority, the following areas of scientific focus include:

- Increasing our understanding of related message and curriculum development; delivery method preferences and effectiveness; and the extent of change in audience knowledge, attitudes, perceptions and behaviors after experiencing an educational program or consuming related information and messages.
- Demonstrating the impact of agricultural literacy efforts on a variety of stakeholder behaviors including consumer behavior (e.g. K-12 test scores, voting behavior, food consumption behavior). Literacy research efforts must be reciprocal in that members of the agriculture industry must also increase their understanding of various stakeholder group needs and/or behaviors.
- Determining the potential of emerging social media technologies, message formats, and strategies in realizing a citizenry capable of making agriculture-related informed decisions. (Doerfert, 2011, p. 8)

Societal needs and these research priorities, coupled with current national agricultural literacy program interventions, necessitated the development of a National Agricultural Literacy Logic Model (NALLM). This model, developed by the authors of this abstract, members of the National Agriculture in the Classroom Organization, FFA, the American Farm Bureau Foundation for Agriculture, and the National Institute of Food and Agriculture - USDA, provides a theoretical framework for critical agricultural literacy research and program evaluation.

How it Works/Methodology/Program Phases

Based on historical research agenda priorities, a coordinated effort to conduct agricultural literacy research is long overdue. The NALLM has been developed using the W. K. Kellogg Foundation template (W. K. Kellogg Foundation, 2004), a flexible, viable model that provides a suitable framework for agricultural literacy research. The model supports theory-based evaluation to measure outcomes and clarifies the assumptions, as outlined in the introduction section. This framework allows for quantitative, qualitative, and mixed methods research approaches to determine program effectiveness and intervention outcomes. The model also has the potential to inform the development of agricultural literacy instrumentation to determine basic agricultural knowledge, assess attitudes and perceptions concerning agriculture, and evaluate *existing* agricultural literacy programs. Secondly, the model may inform the development of new programs and resources to meet agricultural literacy outcomes. The opportunity to present this model as an "innovative idea" among agricultural educators and researchers for consideration, critique, and dissemination, is crucial to addressing research agenda priorities.

Results/Implications

Researchers and program planners who use the model to determine baseline knowledge can evaluate the data concerning actual agricultural understandings and address stakeholder and public perceptions. The model may also be used to evaluate the effectiveness of agricultural literacy programs, with an understanding of existing stakeholders (biases), inputs, activities, outputs, outcomes and impacts. In addition, researchers who use the model to evaluate programs or intervention outcomes will have valid data for comparison and the ability to provide educators and program leadership with credible findings for program improvement and, in some instances, continued funding. The use of the model also offers the ability to conduct replication studies and provide data for correlational studies and meta-analyses. Another important result of using the logic model outcomes would be the development of valid and reliable instruments for measuring agricultural literacy, something researchers have had to define independently in previous research studies. Finally, the data collected will assist in the development of effective program metrics that inform educational programs with data-driven decisions for more effective curriculum and delivery. The use of a logic model provides a stable platform for measuring current levels of agricultural literacy while at the same time allowing for a sustainable approach to measure long-term impacts of programs and interventions.

Future Plans

The dissemination of this model among agricultural education researchers is critical if a cohesive research effort is to be conducted to address the perceived notion or assumption of an agriculturally illiterate society. The model may be used with general populations; however, based on the priorities for agricultural education research, elementary thru post-secondary student populations are the primary target audiences. A proposal has been submitted to the Western Agricultural Experiment Station Directors to develop a multistate research project that would use the NALLM to nationally collaborate on agricultural literacy research with objectives related to Phases 1 and 2 discussed in the methodology. The research conducted with this model initiates decision-making that may "move the needle" toward an agriculturally literate society.

Costs/Resources Needed

The logic model is available online and may be used freely by researchers seeking to test and perfect the model, or for use in a theory-based agricultural literacy research or evaluation study.

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