A Model for Agricultural Education: Diffusion of the SBAE Model in Liberia

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Introduction and Theoretical Framework

It is generally recognized that education in rural areas is considered a fundamental component of increased agricultural productivity, particularly regarding the adoption of new methods, inputs, and technology (Lockheed et al., 1980; O'Donoghue & Heanue, 2016; Phillips, 1994). Moreover, it serves as a catalyst for increased growth in rural communities (Martin & Henry, 2012). In Liberia, a country in sub-Saharan Africa, 48% of the population live in rural settlements (World Bank, 2018) and approximately 80% of the population earn their livelihood from agriculture (Liberia Institute of Statistics and Geo-Information Services, 2017). The outcome of implementing school-based agricultural education (SBAE) in low-income countries like Liberia could lead to the diffusion, and subsequent adoption of a variety of agricultural innovations and impact the livelihood of youth through agricultural transformation (Yeboah, 2018).

Rogers' diffusion of innovations theory (2003) presents four elements necessary for the diffusion of an innovation: the innovation, communication channels, time, and the social system. The *innovation* is an object, idea, or practice that is perceived as new by an individual or group. A *communication channel* is the means by which the innovation is presented or communicated among individuals or groups. *Time* refers to the mental process that an individual or group first learns of the innovation to forming an attitude toward an innovation and subsequently deciding to reject or accept and implement the innovation. The *social system* consists of interrelated individuals or groups with a shared interest in solving a problem or achieving a common goal.

For our study we position the SBAE model as a new teaching model (innovation) presented to Liberian agriculture and science teachers through a series of three trainings (communication channel) over a period of three years (time). In addition, the participating teachers then become potential change agents within their communities as they adopt and implement the SBAE model at their schools (social system).

Purpose and Objectives

The goal of this evaluative study was to determine the likelihood that participants in an agricultural teacher training would implement the SBAE model at their school. The following objectives guided our study, 1) measure the likelihood of participants to implement SBAE in their school and, 2) identify factors that predict the likelihood participants are to implement SBAE in their school. These objectives align with AAAE Research Priority 6, Question 1: "How do agricultural leadership, education, and communication teaching, research, and extension programs impact local communities?" (Roberts et al, 2016).

Methodology

In 2020, staff and consultants from AgriCorps, a non-governmental organization, conducted the first of three agricultural teacher trainings in Liberia. A total of 158 teachers participated in a six-day training program which was repeated in four counties: Bong, Lofa, Montserrado, and Nimba. This first study is part of a larger, randomly controlled trial study that explores the long-term economic outcomes of SBAE implementation and is funded by multiple federal grants. The first training was conducted over six consecutive days with a total of 20 lessons, two of which specifically focused on the SBAE model. The SBAE model used in secondary agriculture programs in the U.S. (Croom, 2008) was modified by AgriCorps and

presented to the teachers at the training. The revised SBAE model consists of four components, 1) experiential, student-centered classroom instruction in agriculture, 2) home-centered entrepreneurial projects, 3) school demonstration gardens, and 4) leadership development through a local 4-H club (AgriCorps, 2020).

To measure the intent to implement the SBAE model presented in the trainings, participants answered a single post-training question on a 5-point scale. To measure the likelihood of implementation, three factors were considered as indicators of implementation prediction: number of years teaching, prior training attendance, and the highest level of schooling. Descriptive and inferential statistics were used to analyze the data.

Results

Objective 1: Participants responded to a single question regarding their intent to implement the SBAE model in their school on a 5-point scale ranging from 1"I definitely will not use this information", to 5 "I will definitely use this information". Based on the results, participants intended to use the information (M = 4.79, SD = .506) with 80.4% (n = 127) responding that they definitely will use the information presented in the training regarding the SBAE model.

Objective 2: A correlation and multiple linear regression with three variables were conducted to identify factors that influenced participants' likelihood to implement the SBAE model in their school. The variables were: number of years teaching, prior workshop attendance, and level of schooling. These variables explained 7% of the variance for the dependent variable (R^2 = .07). All of the correlations were positive; however, none was a statistically significant factor (prior workshop attendance (p = .059), years of teaching (p = .555), and level of schooling (p = .086)).

Conclusions and Recommendations

Our first objective was to measure the likelihood of training participants to implement SBAE in their school. Based on our findings, teachers intend to use the information presented in the trainings by implementing the SBAE model at their schools. Although intent to implement, or adopt the SBAE model is a first step, additional investigation may be warranted to further understand SBAE model implementation beyond participant intent. This raises two potential questions to explore: *how are participants implementing the SBAE model in the classrooms?* and *to what extent has the SBAE model been implemented?* Answering these two questions might be best served by employing qualitative methods such as participant interviews, classroom observation and visits, or focus groups. To address our second objective in which we sought to identify factors that could predict the likelihood of participant implementation of the SBAE model, our data did not provide overwhelming evidence for any factors that predict the likelihood of SBAE implementation by the participants. Considering this, it may be beneficial to explore what influences the likelihood of SBAE model implementation in order to appropriately develop trainings and recruit future participants who are likely to adopt the model.

New innovations, such as the SBAE model in Liberia, depend on opportunities and time for potential change agents to learn, gather information, interact and exchange knowledge, and use it in a creative manner that responds to the social needs of the group (Rogers, 2003; Spielman, et al., 2008). It is through this diffusion process that Liberian agriculture and science teachers have the ability impact the livelihood of youth and communities through effective implementation the SBAE model.

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