Journal of Agricultural Education
Volume 50, Number2, pp. 12 – 25
DOI: 10.5032/jae.2009.02012

ATTITUDES AND STAGES OF CONCERN OF ELEMENTARY TEACHERS TOWARD AGRICULTURE AS A CONTEXT FOR TEACHING ACROSS GRADE LEVEL CONTENT AREA STANDARDS

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Abstract

The purpose of this study was to describe elementary teachers' attitudes and perceptions toward agriculture and its use as a context for teaching across the grade level content area standards. Further, this study sought to probe more deeply the stages of concern possessed by kindergarten through eighth grade teachers with respect to their use of an agriculture awareness curriculum aligned to content area state standards. Results indicated that elementary teachers generally hold favorable attitudes toward agriculture as a viable integrating tool to teach across disciplines. Elementary teachers who reported using the curriculum were unique in their highest stage of concern, but all of the sample members recorded first or second highest stages of concern at the informational stage, thereby indicating a desire to continue gathering information related to the educational innovation. Users of the curriculum recorded the highest relative intensity in the informational and personal stages of concern and lowest intensities in the refocusing and consequence stages. Nonusers recorded the highest relative intensities in the awareness and informational stages, with lowest relative intensities in the refocusing, consequence, and collaboration stages. Recommendations for focused delivery of professional development activities were made.

Introduction

Beginning teachers are faced with many responsibilities and challenges. Not only do they face the pressures of standards-based educational accountability, but they also have specific concerns unique to beginning educational professionals. The Moir model (Joerger, 2002) conceptualized specific stages through which a teacher progresses during the first year of teaching. From anticipation to survival to disillusionment, new teachers experience a seemingly downward spiral during the first few months of teaching. After a period of rejuvenation, teachers then move through a reflection period until they cycle back in anticipation of the next year. According to Darling-Hammond (2002), there are many contributors to this period of uncertainty, all of which affect teacher retention rates. Alarmingly, the average teacher attrition rate during the first 3 years can range from 30% to 60% (Darling-Hammond).

Educational accountability demands are also factors contributing to the pressures placed on teachers at all stages of their careers, but these demands may be particularly concerning to a new teacher seeking tenure. Student performance on standardized achievement tests often determines levels of school funding as well as whether or not administrators retain teachers. In addition, state performance standards often guide teachers in selecting curricula that best prepares students for success on standards-based achievement tests. To that end, beginning teachers are concerned with both how and what to teach in order to meet standards. As such, teachers assume positions as gatekeepers in selecting

and delivering subject matter to students (Barab & Luehmann, 2003).

In an age of educational accountability, school systems often struggle to meet performance expectations and to find the ever-elusive "one size fits all" curricular approach to teaching and learning. With No Child Left Behind as the educational norm *du jour*, state departments of education are often busy ensuring that (a) students are learning from only highly qualified teachers, (b) math and science education is strengthened, and (c) student achievement gaps are closed (Educational Research Service, 2001). All of these demands must be met for schools to successfully compete for reward money, or risk sanctions if expectations are not met.

To assist in meeting these expectations, teachers are encouraged to use curriculum resources that allow students to construct knowledge. Many agricultural education students, parents, agriculture teachers, and industry leaders believe that agricultural education provides a context-rich environment that facilitates this venue (Balschweid & Thompson, 2000; Dailey, Conroy, & Shelley-Tolbert, 2001). As such, agricultural education leaders and supporters have begun to explore potential success of this formula at the elementary and middle school levels.

Since the 1988 report from the National Research Council (NRC) calling for student education in and about agriculture at all levels of education (Committee on Agricultural Education in Secondary Schools, 1988), several agriculturally-based curriculum materials have been produced and distributed to elementary teachers. Curriculum packages developed from projects such as Ag in the Classroom; Project WET (2005); Project WILD (2005); Project Food, Land, and People (1998); and Project Learning Tree (2002) have assisted teachers in integrating agricultural concepts and providing contextual experiences for students. Therefore, the challenge facing teachers is not a lack of available curriculum resources; rather, the challenge lies in how to mold these components into a deliverable, student-centered package.

Historically, agricultural literacy studies in the agricultural education genre focused on assessing teacher and student knowledge and attitudes (Connors & Elliot, 1995; Knobloch & Martin, 2000; Leising, Pense, & Igo, 2001; Meischen & Trexler, 2003), teacher preparation and professional development (Elliot, 1999; Miller & Gliem, 1994; Portillo & Leising, 2003; Terry, Herring, & Larke, 1992; Wilhelm, Terry, & Weeks, 1999), and identifying barriers to curriculum implementation (Balschweid & Thompson, 2002; Conroy, 1999). A dearth exists, however, in studies that have sought to determine the manner in which teachers use support materials once provided for them—or if they use them at all. If the agricultural education profession's national research agenda seeks to "provide a rigorous, relevant, standards-based curriculum in agricultural, food, and natural resource systems" (Osborne, n.d., p. 8), as well as "increase access to agricultural education instruction and programming" (Osborne, p. 8), then research related to how and why teachers choose to utilize agricultural literacy curriculum cannot be sustained in its current leit motif.

Theoretical Framework

The theoretical framework for this study lies in Hall and Hord's (2001) concerns based adoption model (CBAM). Originally developed in 1973, the model is primarily concerned with describing, measuring, and explaining the process of change experienced by teachers attempting to implement new curriculum materials and instructional practices (Anderson, 1997). Moreover, CBAM allows change facilitators—those who provide assistance in the adoption process—to probe the innovation users and nonusers with three key diagnostic tools. Those tools relate to user stages of concern, levels of use, and innovation configurations (Figure 1) as measures to match resources with the needs of the users (Hall & Hord, 2001). Although studies may be carried out with all the diagnostic tools together, the tools may also be used individually or in various combinations (Anderson).

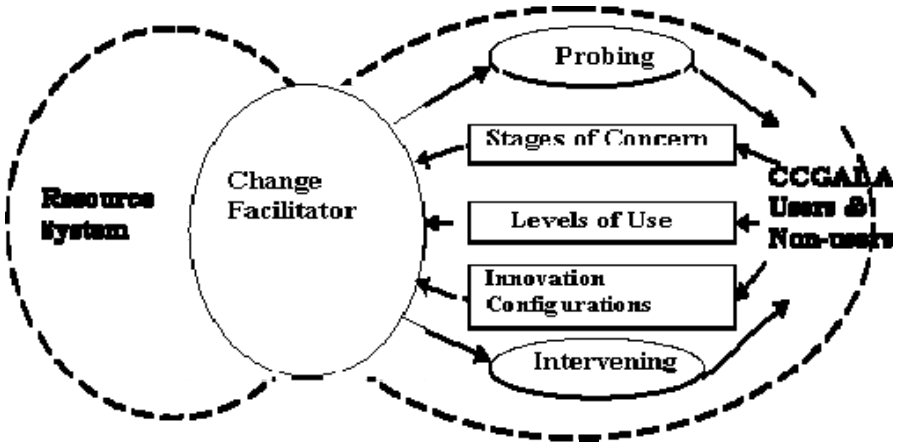

Figure 1. Concerns based adoption model.
Note. From *Implementing Change: Patterns, Principles, and Potholes* (p. xviii), by G. E. Hall and S. M. Hord, 2001, Needham Heights, MA: Allyn and Bacon. Copyright 2001 by Allyn and Bacon. Adapted with permission from the author.

Hall and Hord (1987) characterized principals, teachers, and other district personnel in an educational system, as change facilitators serving as key factors in the success or failure of an educational innovation. Specifically, these individuals are those who, "for brief or extended periods, assist various individuals and groups in developing the competence and confidence needed to use a particular innovation" (Hall & Hord, 1987, p. 11). Bearing this definition in mind, a change facilitator might also be a developer or trainer involved in introducing a particular educational innovation. In the CBAM model, however, the change facilitator is most effective when he or she uses the three dimensions of the CBAM model to probe individuals and groups in an effort to understand and guide their experiences during the adoption process.

Hall and Hord (2001) overtly point to the inequality of investment in people, time, and resources as they pertain to development and implementation of educational innovations. Inasmuch as policy makers and curriculum developers are eager to get an innovation into the hands of teachers, most resources are heavily allocated to development (Marsh, 1987). Conversely, disproportionately fewer resources and care are provided to monitoring the implementation of the innovation, often relegating the innovation to failure status when evaluations are performed and teachers report nonuse of the innovation. Other adoption models treat change as an event, but CBAM presents change as a process (Hall & Hord, 2001). According to Loucks-Horsley (1996), without ongoing resource and facilitator support, sustained use of the innovation is difficult to achieve.

The stages of concern component of CBAM relates directly to how teachers perceive the educational innovation they are asked to implement (Willis, 1992). CBAM's seven stages of concern include awareness, informational, personal, management, consequence, collaboration, and refocusing. These stages span the areas of little concern, knowledge, or involvement in an innovation to a teacher's focus on further exploration of more universal benefits or alternative forms of the innovation (Hall & Hord, 2001). Contrary to other, more linear views of change concerns, CBAM recognizes that although a person's focus of concern may shift from one stage to another, it does not indicate that the previous stage of concern is alleviated (Willis).

The levels of use component of the model corresponds to teachers' behavior in

relation to the educational innovation in question (Willis, 1992). Hall and Hord (2001) demarcate eight levels into which a person can be classified in terms of the extent the innovation is used: nonuse (0), orientation (I), preparation (II), mechanical use (III), routine (IV-A), refinement (IV-B), integration (V), and renewal (VI). Essentially, these levels are the sequence through which a user passes during the change process as he or she gains confidence and skill in using the educational innovation. Equally, a person may remain invariant during the change process (Newhouse, 2001). McKinnon and Nolan (1989) suggested that 75% or more of the individuals involved in an educational innovation adoption must operate at Level IV-A or higher to sustain innovation adoption and use.

There are psychological factors to consider when an educational innovation is introduced to teachers, specifically, the effects of learning to use the innovation (Hope, 1997). As such, assessing widespread adoption of the innovation is not something that occurs instantaneously. Rather, it may take two to four years for an individual to progress through the change and confidently and skillfully use the innovation as intended (Mitchell, 1988). Additionally, teachers face the expectation of having to implement innovations with limited usage instruction and without a clear understanding of the innovation's purpose or their role in what they are asked to do (Hall & Hord, 2001). As a result, teachers motivated to move from an awareness stage of concern and orientation level of use may return to the classroom and implement the innovation in a manner not in line with what the developers of the change originally envisioned (Hall & Hord, 2001).

Only a few studies in agricultural education have used CBAM as a conceptual model for the study of curriculum innovations. Petrea (1994) reported that agriculture teachers in Illinois expressed intense concerns about the relevance of an agriscience curriculum for students and how the innovation would affect student outcomes (impact concerns). Teachers' second highest level of concern dealt with the demands of the innovation and the instructor's role with the innovation (personal concerns). Ohene-Adjei (1995) reported similar concerns from Illinois teachers using new agriscience curricula, indicating that those concerns may have long-term implications for teacher inservice.

In studies completed using the CBAM model outside the field of agriculture, Ward, West, and Isaak (2002) reported that both mentors and protégés demonstrated decreased concerns at the awareness and management stages and increased concerns related to effect on students and collaboration with others. McKinnon and Nolan (1989) reported that participant concerns shifted from personal to information concerns in a computer hardware/software curriculum innovation.

In a study of science teachers' concerns about using a constructivist approach to teaching science with real-life experiences as the context for teaching, Dass (1997) identified concerns ranging from initiation to the terms "constructivist" and "module" (awareness and informational stages) to concerns about the reward structure matching the level of work required (personal) to deviating from the standard sequence of the grade level team approach (management). Further, some teachers moved into the consequence and collaboration stages, specifically noting the tense feelings of the innovation's effects on student SAT scores. Dass provided critical research analyses by reinforcing the notion that "fundamental reform at the classroom level is intimately connected to reform of professional development at broader levels" (Dass, p. 19).

Kember and Mezger (1990) referred to the instructional designer as a change agent. As defined by Rogers (2003), a change agent serves as a support mechanism in hopes that a person will subsequently adopt a given innovation. Data from Kember and Mezger's study indicated that instructional designers played a significant and ever-changing role as each writer moved through his or her stages of concern.

Educational innovation developers frequently place significant emphasis and resources on the development of an educational innovation (Hall & Hord, 2001). Conversely, resources for introduction,

implementation, and sustained adoption of such innovations are disproportionately out of balance. As such, teachers frequently find themselves struggling on their own to understand and use newly introduced educational innovations. Evaluative measures, when performed, serve simply to assess *if* a teacher is using an innovation. If data demonstrate nonuse, the innovation is deemed a failure. If data indicate teacher use, the innovation is reasoned a success (Hall & Hord, 2001).

The problem with traditional educational evaluative measures is that teacher concerns, levels of innovation use, and innovation configurations employed by the teacher are rarely considered in agricultural education curricular evaluation assessments. This leaves a gap in the body of knowledge as to the depth and breadth of true, sustained use of educational programming.

Purpose and Objectives

The purpose of this study was to explore the experiences of elementary teachers in their adoption or rejection of an agricultural awareness curriculum. The three objectives that guided this study were:

1. Describe the demographic and psychographic characteristics of the target population (gender, age, teaching experience, school type and location, agricultural background, and use of curriculum guidelines).

2. Describe elementary teachers' attitudes and perceptions of agriculture as a context for teaching elementary students.

3. Describe elementary teachers' current stages of concern with respect to implementing the *California Curriculum Guidelines for Agricultural Literacy Awareness*.

Methods and Procedures

The target population for this study was current elementary teachers who, as preservice teachers, participated in a 5-week course, *Organizing and Teaching K-6 Standards and Awareness in Agricultural Literacy*, introducing instructional activities for integrating agriculture into elementary curriculum (N = 46). This course was taught by faculty at California Polytechnic State University, San Luis Obispo. A total of 46 students were enrolled in the course over a 2-year period. The members were contacted 2 years after completing the course and asked to complete a mailed questionnaire. Contact information could not be obtained for six of the original course completers, resulting in an accessible population of 42 members. Exhaustive measures taken to contact the six members included using university records of last known address, telephone number, and e-mail address. Materials were sent both via postal service and e-mail and were returned non-deliverable. Voice mail messages were left on last recorded telephone numbers with no response. On the basis of the self-reported number of days using agriculture as a teaching context, a purposive sample of participants (n = 10) was selected for follow-up study regarding their stages of concern with the agricultural literacy curriculum. The sample consisted of four participants who reported using a specific agricultural awareness curriculum aligned with state standards the greatest number of days and six who did not use the curriculum guidelines package at all.

All members of the population were mailed a researcher-designed questionnaire to solicit attitudes toward and perceptions of agriculture as a context for teaching elementary students. Descriptive statistics were used to analyze this preliminary survey data. The researcher field-tested a similar questionnaire with 130 elementary teachers from another state to assess attitudes toward agriculture as a context for teaching. Minor changes were made pertaining to the appropriate curriculum innovation name references; otherwise, the instrument was administered intact. Content and face validity were established through use of a panel of experts in agricultural literacy curriculum development. The initial instrument yielded a Cronbach's alpha reliability rating of .87 for the construct "attitudes toward agriculture as a context for

teaching elementary students" and .70 for the construct "attitudes toward agriculture."

From the accessible population, 36 of the initial instruments were returned for an 85.7% response rate. Lindner, Murphy, and Briers (2001) concluded that nonresponse error control measures are not necessary for studies that yield 85% or greater response rates. All of the returned instruments were deemed usable for assessing the demographic and psychographic characteristics of the target population.

The Stages of Concern Questionnaire (SoCQ) was composed of 35 questions related to teachers' perceptions about an educational innovation. This study modified the questions to fit elementary teachers' use of agriculture as a context for teaching, with specific reference to the *California Curriculum Guidelines for Agricultural Literacy Awareness* package. The theoretical test/retest reliability ratings for the SoCQ ranged from .65 to .86, and internal consistency alpha-coefficients ranged from .64 to .83 (Hall & Hord, 2001). Hall and Hord's *SoCQ Quick Scoring Device* was used to assess participants' current stage of concern relative to the literacy curriculum use. Similar to Hope (1997), this study used nonparametric, descriptive statistics (percentages and frequencies), with respect to teachers' first and second highest stage scores, as the simplest means to interpret overall teacher stage of concern.

Results

Objective 1: Describe the demographic and psychographic characteristics of the target population

Although the sample in this study was purposively selected from the target population, analyses indicated that the demographic and psychographic characteristics of the sample mirrored the target population. Gender, age, and teaching experience demographics of the sample paralleled those of the target population (Table 1).

Table 1
Summary Means of Sample and Target Population Demographic Characteristics

Characteristic	X	μ
Gender	90% female	88.9% female
Age	25 years	25 years
Teaching experience	1.2 years	1.3 years
School type	90% public	90.3% public
School location	60% suburban	51.6% suburban

The population and sample characteristics were nearly identical in terms of gender (μ = 88.9% female, X = 90% female), age (μ = 25 years, X = 25 years), and teaching experience (μ = 1.3 years, X = 1.2 years), indicating the purposive sample very closely resembled the target population. Notably, not all of the respondents currently held teaching positions, but that did not preclude their participation in the initial stage of the study to gather attitudinal data related to teaching elementary students using agriculture as an integrating context (Table 2).

Table 2
Participants' Use of the California Curriculum Guidelines for Agricultural Literacy Awareness (n = 36)

Statement	*f*	%
Yes, I am teaching agriculture using the agricultural literacy curriculum package	8	22.2
No, I do not use the agricultural literacy curriculum package, but I infuse agriculture in other ways	9	25.0
No, I am not teaching any agriculture in my classroom	14	38.9
I am not currently teaching	5	13.9

Whereas 14 respondents (38.9%) reported not teaching any agricultural concepts in their elementary classes, 17 (47.2%) indicated they were teaching agricultural concepts. This teaching was accomplished either through use of the comprehensive agricultural literacy curriculum guidelines package or was infused via other preparation means. Of the 31 respondents who were currently teaching, 90.3% (n = 28) reported teaching in a public school setting. Two of the remaining three respondents (5.6%) reported teaching in a private school setting, and the remaining participant taught at a charter school. From a geographical perspective, 51.6% reported teaching in a suburban area (n = 16), and another 35.5% specified teaching in a rural area (n = 11). Only five respondents reported teaching in an urban setting.

Only 27.8% of respondents (n = 10) indicated any previous experience related to production agriculture, involvement in a youth agricultural organization such as 4-H or FFA, or a paid agriculturally related work experience (Table 3). Although more than 80% of respondents (n = 29) selected "completed some agricultural coursework in college," 20 respondents anecdotally noted on the instrument that the only agriculturally related coursework completed was the course from which this study's population was comprised.

Table 3
Previous Agricultural Experience of Participants

Previous agricultural experience	*f*
None	4
Raised in a rural/agricultural family	9
Participated in production agriculture	3
Participated in youth agricultural/FFA/4-H experience	4
Participated in paid work experience in agriculture	3
Majored in agriculture in college	1
Completed some agricultural coursework in college	29[a]

[a]Of those who indicated they completed some agricultural coursework in college, 20 indicated the agriculture class completed was the course from which the sample was drawn.

Objective 2: Describe elementary teachers' attitudes and perceptions of agriculture as a context for teaching elementary students

Attitude toward agriculture scores was determined by summing the individual values for the seven items that encompassed the agricultural attitudes construct of the initial population instrument (Figure 2). Data were collected from 36 individuals (85.7%) within the population. Scores ranged from 18 to 30 with a mean score of 23.92 (*SD* = 2.53). Participant scores of attitude toward using agriculture as a context for teaching content grade level standards at the elementary level were calculated by summing the individual scores across the 21 items comprising the construct (Figure 3).

Valid data were collected from 36 respondents with scores ranging from 62 to 96. The mean score was 82.67 (*SD* = 7.89).

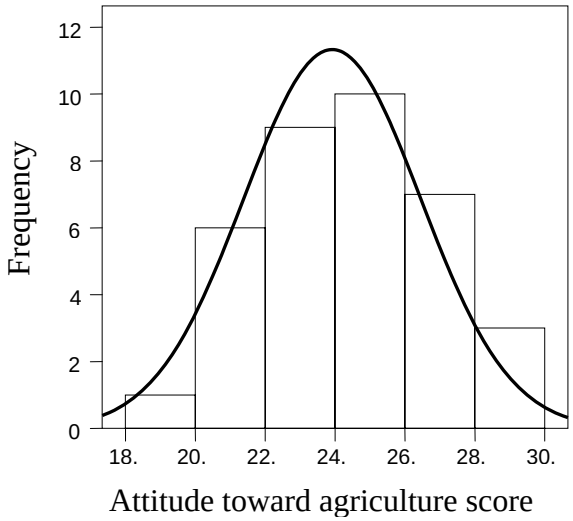

Figure 2. Distribution of participant attitude toward agriculture scores.

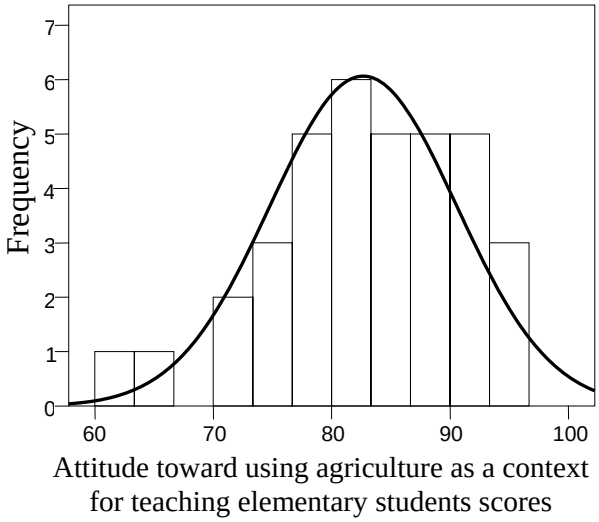

Figure 3. Distribution of participant attitudes toward agriculture as a context for teaching elementary students scores

Objective 3: Describe elementary teachers' current stages of concern with respect to implementing an agricultural literacy curriculum

Subsequent to the selection of the purposive sample for interviews and further analyses of teacher concerns related to the adoption and sustained use of the new curriculum, each interviewee was asked to complete a SoCQ. Individual peak stages of concern were identified for each participant in the sample. Figures 4 and 5 illustrate the relative intensity of the participants for each respective stage of concern. According to Hall, George, and Rutherford (1998), the greater the score in a stage of concern, the more intense the concerns at that stage. Figure 4 illustrates the mean relative intensity of participant stages of concern for users of the curriculum innovation as a context for teaching across the elementary grade level content standards. The highest stage of concern, with an intensity score of 76.7, was informational, followed by personal (*M* = 72.0). The stages of concern with lowest relative intensity were refocusing (*M* = 41.5) and consequence (*M* = 41.7).

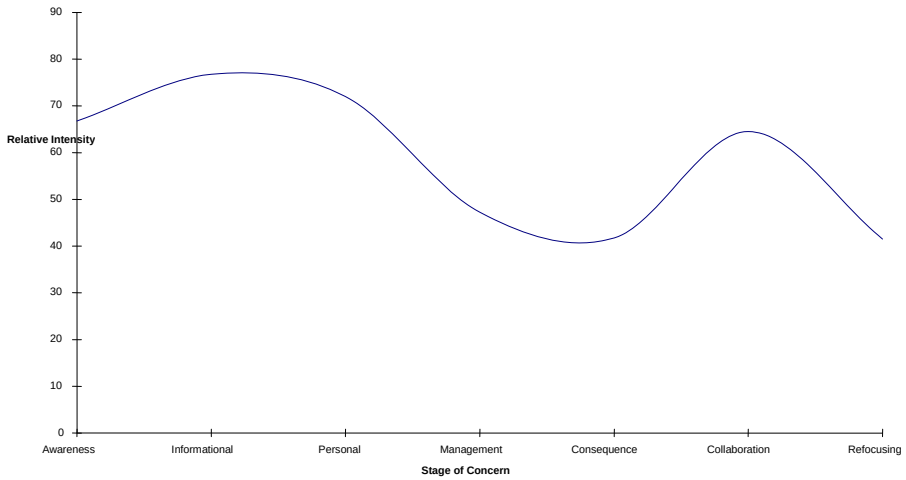

Figure 4. Distribution of stages of concern for curriculum users (*n* = 4).

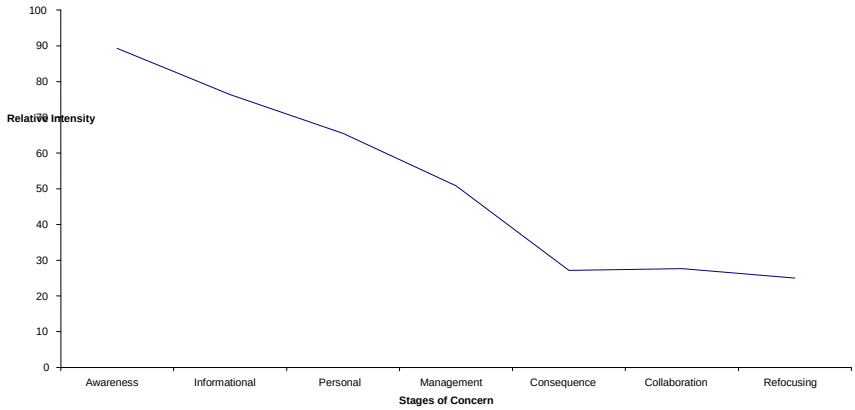

Figure 5. Hypothesized and actual stages of concern for curriculum nonusers (*n* = 6).

Figure 5 illustrates the mean relative intensity of participant stages of concern for nonusers of the curriculum innovation as a context for teaching across the elementary grade level content standards. The highest stage of concern, with a mean relative intensity score of 89.3, was awareness. The second highest stage of concern was informational, with a mean of 76.3. The stages of concern with lowest relative intensities were refocusing (*M* = 25.0), consequence (*M* = 27.2), and collaboration (*M* = 27.7). All self-reported nonusers of the curriculum reported a highest relative frequency concern as either awareness or informational.

Conclusions, Implications, and Recommendations

Elementary teachers in this study expressed generally favorable attitudes and perceptions toward agriculture and its use as an integrating context to teach across content area standards. However, respondents reported a relatively low use of each respective curriculum. This finding is consistent with the research of Balschweid, Thompson, and Cole (1998). They found that professional development program participants integrated agricultural lessons into existing coursework fewer than 20 times in an academic year. Swortzel (1997) reported lack of time, interest, and knowledge as primary reasons noted for not using an agricultural context, even though teacher attitudes and perceptions were favorable.

Elementary teachers who were exposed to the agricultural literacy curriculum but lacked preservice and inservice practice either exhibited little concern or involvement with the innovation or had a limited awareness of (and interest in) learning more about the innovation. In contrast, teachers who had preservice and inservice experience and practice with the curriculum demonstrated a propensity to move into more substantive stages of concern. This is an important finding and has major implications for teacher education programs. If innovations are to be successfully implemented, preservice exposure must be followed by some type of follow-up inservice application if teachers are to implement the innovation. The common format for inservice programs is to present information and then leave it up to the local teacher to implement the new information. On the basis of findings of this study, teachers will likely not make that implementation.

According to Hall and Hord (1987), relative intensity scores of nonusers are highest at the awareness and informational stages. As seen in Figure 6, this study supports that hypothesis. The concerns of teachers who do not use an innovation infer that they either do not know about the innovation or feel they have so little information about it that they cannot use it effectively.

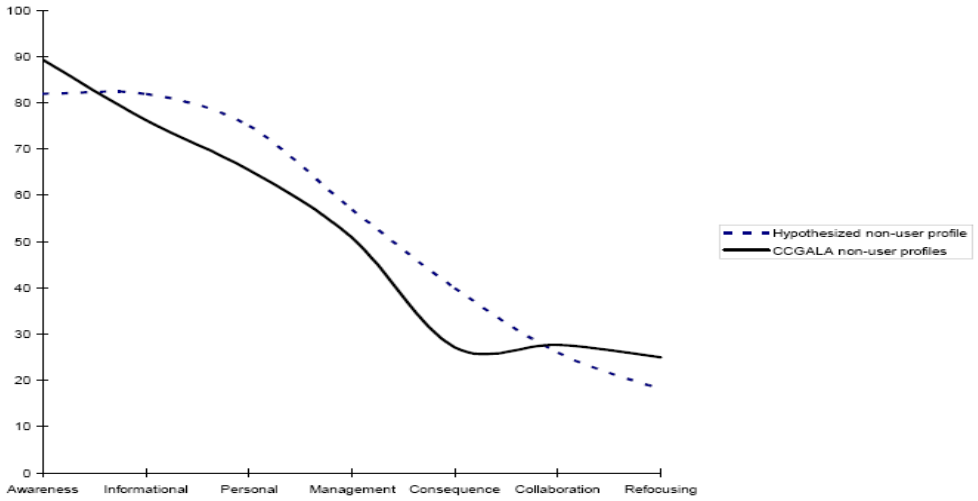

Figure 6. Hypothesized and actual stages of concern of nonusers.

Users of an innovation fall into two categories: experienced and inexperienced users (Hall & Hord, 1987, 2001). According to Hall and Hord, inexperienced users' concerns are best represented as a bell-shaped curve centered on the management stage (Figure 7). Experienced users, however, are less egocentric in their concerns and more focused on the effect of the innovation on the students and on the

goal of collaboration for a more comprehensive delivery of the innovation (Figure 7).

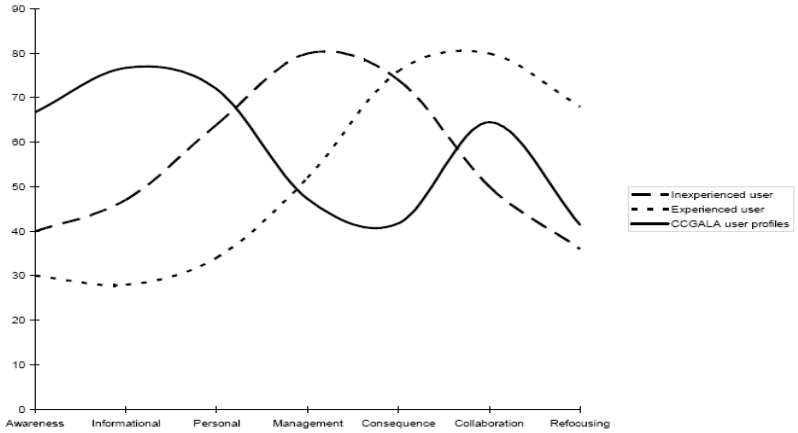

Figure 7. Stages of concern for respondents and hypothesized experienced and inexperienced users.

Teachers in this study exhibited a hybrid of the experienced and inexperienced user profiles, with the trend line indicating highest stages at informational and personal and the lowest points of the curves in opposition to the typical inexperienced user. Interestingly, the trend moves back in a favorable direction toward collaboration. The questions that logically follow are: Why are inexperienced users not concerned with management? Why are inexperienced users actively seeking more information and collaborative opportunities? Do teachers of agriculture subject matter fail to follow the CBAM?"

Because the respondents of this study were beginning teachers choosing to use a new innovation, they may have been seeking more information about the innovation while also examining their background knowledge to ensure confidence in their ability to deliver the subject matter. Also, preservice exposure to the curriculum guidelines in a collegiate course may have contributed to their willingness to use it in the classroom and move more toward the collaborative stages. In short, the collegiate course may have bridged the gap from inexperience to experience.

Further research recommendations include conducting longitudinal studies to track how these new teachers progress through the stages of concern. In addition, quantitative analyses should be conducted to determine whether significant differences exist between users and nonusers contingent upon the amount of time that lapsed between first exposure to the curriculum guidelines and opportunity for first use in the classroom. Subsequent studies on this and other similar populations warrant pursuit in an effort to solidify these results with a greater number of participants. Doing so may assist the agricultural education profession in achieving its focused goals in the national research agenda as well as provide a stronger foundation for a partnership with educators at the elementary level. Focusing on the CBAM as a means to gauge educator continued use and/or nonuse of educational innovations will serve the agricultural education profession well as a means to provide continuity in assessing successful implementation regardless of innovation type.

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