

Assessing the Acceptance of Incorporating Agriculture into Elementary School Curriculum

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Abstract

Agriculture is essential to meeting our basic human needs for food, clothing and shelter, however; many citizens lack the agricultural literacy to understand the connection between agriculture, the environment and themselves. It is necessary for individuals to be agriculturally literate to make informed every-day decisions. It is vital that young people are given the opportunity to become agriculturally literate and that teachers understand the value of educating students about agriculture. Through the use of a teacher survey distributed to elementary school teachers in grades Kindergarten through 6th; this study assessed teacher acceptance of incorporating agriculture into elementary school curriculum. A total of 407 teachers participated in the study. The results suggest that elementary grade teachers perceive agriculture education as important and they would be interested in learning more about incorporating it into their curriculum. However, most of the participants were not currently using agriculture in their classrooms. Recommendations include increased marketing of AITC resources and connections with pre-service teachers. Further research should include a national replication for more generalizability.

Keywords: agriculture in the classroom; AITC; elementary school; incorporating agriculture; agriculture

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Introduction and Need of the Study

Prior to the industrial revolution, agriculture played an important part in the development of the United States and the world and most individuals had some direct connection with the production of the food they ate. However, due to improvements in crop production and automation, and an ever-increasing suburban population in the United States, fewer people today are directly involved in the agriculture industry. As a result, many citizens today lack the agricultural literacy, knowledge and understanding of food and fiber systems, that enables them to make informed decisions about agriculture. An agriculturally literate individual understands the food and fiber system, including the historical and economic, social and environmental impacts of this system on all individuals (NRC, 1988). With fewer people directly involved in production agriculture, leading to societal disconnections with the agriculture industry, the need for society to possess agricultural literacy to make educated and informed decisions about agriculture is critically important (Kovar & Ball, 2013; Pope, 1990). In their roles as consumers of agricultural products and influencers of policy and economics, it is essential that

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citizens are agriculturally literate (Terry, Jr. et al., 1996). As urbanization continues to increase and the agri-food system continues to come under strong criticism, an agriculturally literate citizenry is important (Powell et al., 2008). Additionally, the complexity of agricultural issues continues to be presented to lawmakers and society for a vote, requiring more citizens to be more informed and educated about agriculture (Kovar & Ball, 2013). Americans who are agriculturally literate are more likely to support agricultural policies than those lacking agricultural literacy (Ryan & Lockaby, 1996). Educating the general public, including youth, about agriculture is an important aspect in shaping and changing attitudes towards agriculture's important role in our everyday lives.

To aid in this endeavor to increase agricultural literacy among American citizens, the National Research Council (NRC) in a publication entitled *Understanding Agriculture – New Directions for Education* (1988), concluded that agriculture should be offered to all students, regardless of their career goals or whether they are from an urban, suburban or rural background. The NRC also recommended that all students should receive at least some systematic instruction about agriculture, beginning in kindergarten or first grade and continuing through twelfth grade (Frick et al., 1991; NRC, 1988). Since 1988, new technologies and issues (e.g., biofuel production, organic farming, genetic modification, and climate variability) have given rise to a new era in agricultural literacy (Kovar & Ball, 2013). Embracing this new era in agriculture literacy is going to take a determined effort at all levels of education. Have educators tasked with helping increase agricultural literacy among Americans kept up with the changes? Amidst the changes, what are the perceptions of agriculture among educators? Are educators interested in the integration of agriculture in their classes? It is unclear what elementary teachers know in Nevada about AITC resources and is therefore necessary to conduct research to answer that question. Understanding teachers' perceptions and awareness of agriculturally related resources can help state AITC leaders identify strategies to enhance teacher participation in AITC and increase agricultural literacy among youth. This study seeks to explore elementary teachers' perceptions of integrating agriculture into their teaching practice.

Theoretical Framework

The theoretical framework from which this study is situated is the Stages of Concern (Hall & Hord, 2006). A component of the Change Based Adoption Model, this theory suggests that individuals' perceptions about innovations can change based upon the individual's feelings and perceptions of the change as it progresses. Hall and Hord (2006) posit that perceptions about innovations and change processes can be classified as concerns and placed into stages. The *Stages of Concern* range from 0-awareness, which falls into the "unrelated" pattern, indicating the individual is not concerned about the innovation to 6-refocusing in the "impact" pattern, where the individual has utilized the innovation and has some ideas about improving it (see Table 1). Many factors influence individual states of concern, including one's knowledge and experiences. As individuals gain knowledge and have additional experiences, they will make decisions that will move them through the *Stages of Concern*, which is a developmental path through the change process (Hall & Hord, 2006). Innovations and change occur in education systems, thus requiring teachers to orient themselves within the Stages of Concern and potentially move from the Awareness stage through actively using the innovation in the Collaboration and Refocusing stages.

Table 1
Stages of Concern Theory. Adapted from Hall & Hord (2006)

Pattern	Stage	Description
Impact	Stage 6	Refocusing – I have some idea about something that would work even better.
	Stage 5	Collaboration – I am concerned about relating what I am doing with what my co-workers are doing.
	Stage 4	Consequences – How is my use affecting clients?
Task	Stage 3	Management – I seem to be spending all of my time getting materials ready.
Self	Stage 2	Personal – How will using it affect me?
	Stage 1	Informational – I would like to know more about it.
Unrelated	Stage 0	Awareness – I am not concerned about it.

In their study involving elementary teachers' implementation of agriculture education as an innovation, Bellah & Dyer (2009) found that those teachers who'd been introduced to the agriculture literacy curriculum, but had not received training in this innovation, were lower in their stages of concern. They also found that those teachers who had experience with the curriculum ranked higher in their stages of concern (Bellah & Dyer, 2009). Individuals, including teachers, decisions about new innovations or changes affecting their teaching practice are influenced by a variety of factors (Rogers, 2003; Russell & Bradley, 1997; Ertmer, 1999). This theory can help explain the concerns and perceptions elementary teachers might have regarding the incorporation of agriculture into elementary school curriculum. We suggest several factors, which are situated within the six-stage model, influence elementary teachers' decisions about utilizing and incorporating AITC materials into their current curriculum. These factors include knowledge teachers possess of AITC, ease of accessing and using the AITC resources, interest in professional development related to agriculture, teacher feelings about the importance of agriculture, years of experience teaching, grade they teach, ability to use agriculture to teach other subject matter, social norms of the school and colleagues related to agriculture and AITC curriculum, and willingness to invest time and money to incorporate AITC materials into their teaching practice. Determining the relationship between these factors and teachers' willingness to incorporate AITC materials into their curriculum will assist in identifying where teachers are in relation to the Stages of Concern, which will then inform AITC programs as to the most effective way to market and deliver AITC resources to elementary teachers.

Literature Review

Advancements and changes in technology, agriculture, and society has led to a population physically removed from production agriculture (Kovar & Ball, 2013). While agriculture is an integral component of today's society, the knowledge gap regarding the basic understanding of the food and fiber system among youth and adults seems to be widening, and worse yet, agriculture seems to be under attack (Martin, 2016; Powell et al., 2008). While the definition of agricultural literacy has evolved

over time, it has generally been agreed upon that to be considered agriculturally literate, an individual must understand the food and fiber system, including its history and its economic, social and environmental importance (NRC, 1988). It is also understood that agricultural literacy relates to education about agriculture (NRC, 1988). Frick et al. (1991) concluded: "Agricultural literacy can be defined as possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture" (p. 52). More recently and in light of advancements in technology and agriculture, a society that is agriculturally literate has more than mere knowledge of systems, but "an understanding of agriculture and current economic, social, and environmental impacts [which] could lessen current challenges facing agriculture through good decision making along with providing the necessary support" (Kovar & Ball, 2013, p. 168).

Educating young Americans will take a concerted effort on the parts of the agriculture industry, elementary, middle and high school education systems as well as the systems of higher education that oversee teacher training. Although started in 1981, Ag in the Classroom (AITC) continues to be a program that strives to improve agriculture literacy among young people by providing teachers with curriculum for use in their classes. AITC is believed to be the most extensive effort to increase knowledge of the food and fiber system of elementary school students (NRC, 1988). Each of the 50 states, as well as U.S. territories, operates an AITC program. While each program functions differently, as a whole, AITC strives to bridge the gap between the agriculture community and the general public, more specifically the education community (NAITC, 2019d).

AITC provides materials and workshop opportunities to help teachers incorporate agriculture into their teaching (NAITC, 2019b). The curriculum from AITC meets educational standards and can be incorporated into different subjects, such as math, language arts and social studies, which are already being taught in the classroom. Incorporating AITC materials into elementary curriculum allows teachers to teach required subject matter, meet educational standards and provide diversity in the learning environment, while improving agricultural literacy. These materials are almost always free and available in different formats to accommodate individual preferences. For example, *A Day Without Dairy* is a free lesson for third through fifth grades, where students use graphs to learn about the economics of the dairy industry and contemplate life without dairy products (NAITC, 2019c). *Freshest Fruits* is a free lesson that includes a series of hands-on activities where students learn about different types of fruit by comparing size, shape, texture and seeds (NAITC, 2019c). In the continual uphill battle toward an agriculturally literate population, AITC is an invaluable resource. The AITC resources not only promote the course of improving agriculture literacy but offers innovative and motivational opportunities to teachers who are continually striving to inspire their students to learn (Williams & White, 1991). Yet despite the benefits AITC can offer to teachers and some states offering in-service teacher workshops, many teachers do not learn about the resources during their pre-service teacher training or after entering the classroom (NAITC, 2019a). According to the National Agriculture in the Classroom 2018 State Report, 9,090 pre-service elementary and secondary teachers were contacted or trained with AITC resources in 2018 and 96,309 in-service teachers were trained face-to-face (NAITC, 2019a). Given that there were approximately 3.2 million elementary and secondary teachers nationwide with an estimated 336,000 new hires in public and private schools in 2018, less than 3% of in-service and pre-service teachers nationwide are learning about AITC (National Center Education Statistics, 2018).

While elementary teachers recognize the educational value for students who are exposed to agricultural instruction in elementary school, several factors have been identified related to teacher's beliefs about actually integrating agriculture into school classrooms (Knobloch, 2008). School system factors, such as overcrowded curricula (Daggett, 2000) and increased accountability and standardized testing (Linn, 2000) have been identified as important factors influencing teacher decisions to integrate

agriculture. For example, with the adoption of the No Child Left Behind Act (NCLB) in 2001, and later the Every Student Succeeds Act (ESSA) of 2015, the intense focus on testing and accountability has placed pressure on teachers and administrators to ensure the success of students on the core subjects (Ravitch, 2010). This has necessitated the educational emphasis be placed content to be tested. Despite desires from teachers to deviate and teach to the interests and needs of the students, NCLB and ESSA limited teachers' abilities to broaden their curricular reach, such as integrating agriculture into their lessons (Spring, 2008). So, for some teachers, integrating agriculture into their classroom may not be much of a priority. Other research has identified teachers lacking self-efficacy regarding agriculture or an understanding of the benefits of agriculture (Knobloch et al., 2007; Knobloch, 2008) as reasons for not integrating it into their classrooms. Yet, little research has been done examining the influence of teachers' professional characteristics (e.g., teaching experience, grade level taught) on their choice to integrate agriculture in their teaching. Professional characteristics like experience teaching and grade level may influence the likelihood of integrating new curriculum. For example, a young teacher might seek out curricular resources, such as AITC, as they work to establish their own teaching resource library.

Purpose and Objectives

The purpose of this study was to determine the perceived importance, interest in, and the awareness of agriculture-related resources among elementary teachers. This research addresses the AAAE's National Research Agenda priority one, imploring that research be conducted focusing on the public's understanding of agriculture. Specifically, the research agenda seeks to explore programs such as AITC, to determine their effectiveness at improving agricultural literacy resulting in a more informed public (Enns, Martin, & Spielmaker, 2016). The following research objectives guided this study:

1. Determine teachers' awareness of and current utilization of AITC resources in their classroom.
2. Determine teachers' perceived importance of agriculture and AITC resources by demographic characteristics.
3. Determine teacher interest in agriculture-related resources for use in their classrooms by demographic characteristics.

Methods

As part of a larger study, this quantitative descriptive study employed survey research methodology. All elementary teachers, kindergarten through sixth grade, including special education teachers, teaching in Washoe County school district were the target population for this study. We attempted a census of the target population. The community in which the target population was located had a community population of more than 460,000 students which is approximately 15% of the total population of Nevada, and each school served students primarily in urban and suburban settings. This particular school district was selected for this study because of its large suburban and urban population—and therefore mimics the way most Americans live (i.e., is representative of a large portion of the US population).

The survey used in this study was a researcher developed survey containing Likert-type statements across three different sections. Using a four-point scale, which ranged from (1) *Strongly Disagree* to (4) *Strongly Agree*, participants indicated their level of agreement for each of the statements on the survey instrument. Section one of the survey instrument contained three statements focused on teachers' perceived importance of agriculture education. A sample statement included, "agriculture education is important to elementary aged students." The three statements were combined to make one construct we called "importance of agriculture." Section two of the instrument contained six statements focused on teacher interest in agriculture-related curriculum. Sample statements included, "I would be

interested in agriculture related lesson plans that meet current required educational standards,” and “I would be interested in receiving free curriculum materials to use in my classroom.” Each of the six statements were combined to make one construct we called “interest in agriculture curriculum.” The third section of the instrument consisted of five demographic questions which elicited teacher information about the grade level they taught, how many years they had taught, and if they had ever heard of or used AITC materials. The instrument was designed in a teleform/bubble format, in which participants completed the survey with a pen or pencil by bubbling in their responses. The teleform format enabled the surveys to be scanned into the computer and saved into a Statistical Package for Social Sciences (SPSS) file for analysis.

Prior to distribution of the larger, research survey, a pilot survey was developed by the researcher and completed by 105 teachers who attended the AITC Farm City Festival and found to be reliable (Cronbach’s $\alpha > .70$; Nunnally & Bernstein, 1994). This pilot survey was used to inform the development of the survey used in this research. The survey instrument was examined and critiqued for face and content validity by professional researchers and educators in agriculture and educational fields as well as state agriculture in the classroom professionals. IRB approval was obtained before distributing surveys to the research population.

We contacted each school by telephone to schedule a time when the surveys could be delivered in person to the teachers. After three phone attempts were made to contact the principal with no return call, an email was then sent in an attempt to schedule a time. Typically, principals would allow a short amount of time during a staff meeting for introduction of the study. The researcher took approximately five to ten minutes during the staff meeting to introduce the study, explain the process of participation and answer any questions. The surveys were then left at the meeting to be picked up by the teachers wanting to participate and the collection box was placed in a location determined by the principal of each school. The collection box remained at the location for two weeks, allowing participants to complete the survey and turn it in at their convenience, while also maintaining their anonymity. Of the 73 elementary schools contacted, five did not respond to phone messages or email attempts and four responded, declining participation in the study. Thus, the study included 62 of the elementary schools within the school district. A total of 407 responses were received from a total of 1,359 possible teachers from the 62 schools for a response rate of 30%. A test for non-response bias among elementary schools within the district was conducted, using logistic regression and factor analysis, to determine whether there was any significant relationship between the schools that participated in the study and those that did not (Gay et al., 2009). The results of the regression and factor analysis suggested there was no non-response bias; no difference between schools who participated and those who did not. Minus any non-response bias, the sample was considered representative of the population of elementary schools in the school district.

After collecting surveys from participants, they were scanned into the computer and saved into the Statistical Program for Social Sciences (SPSS) for analysis. Any surveys that were completed in a way that prevented them from being scanned in, were entered by hand. A post-hoc reliability was conducted in order to establish the reliability of the survey instrument. Bivariate correlations and factor analysis were conducted to determine those individual items measuring similar components. To reduce the random measurement error and obtain a clearer picture of the relationships, items found to be measuring the same components were combined into constructs, by creating a new variable equal to the mean of the combined items. The result for the overall instrument revealed a satisfactory (Nunnally & Bernstein, 1994) reliability estimate of $\alpha = 0.85$ with individual constructs ranging from $\alpha = 0.78$ (i.e., importance of agriculture) to $\alpha = 0.80$ (i.e., interest in agriculture curriculum).

Descriptive statistics were used to describe the characteristics of the elementary teachers to determine awareness of and current utilization of AITC resources in their classroom. For objectives

two and three, descriptive statistics were used to describe overall importance of agriculture and interest in agriculturally related resources including frequencies and percentages. Means and standard deviations were used to provide a clearer picture of the data. Furthermore, two multiple linear regression analyses were performed to determine the relationships between teachers' demographic characteristics and importance of agriculture and interest in agriculture-related resources. The dependent variables in the regression analyses were importance of agriculture and interest in agricultural-related resources. Two independent variables were entered into the regression analyses, grade level (kindergarten - sixth grade), and years of teaching experience. According to Green (1991), when testing individual predictors in a regression model the minimum acceptable sample size should be $104 + k$. With two variables entered, the minimum acceptable sample size was 106 respondents. With 407 respondents in this study, we concluded there was sufficient stability and power to test the model. Betas, standardized betas, and overall R^2 were calculated and reported for each of the two regression analyses performed.

Results/Findings

The purpose of this study was to determine the perceptions of elementary teachers towards agricultural resources, and to determine the extent to which elementary teachers currently utilize agricultural resources in their curriculum. Objective one sought to describe the characteristics of the teachers in the study as well as determine teachers' awareness of and current utilization of AITC resources in their classroom. Of the teachers who participated in this study ($n = 407$), 17.4% represented first grade teachers, 16% were second grade teachers, 17.2% taught third grade, 14.4% were fifth grade teachers and 9.8% taught sixth grade. Respondents also represented several different experience levels, ranging from first-year teachers to those with more than 19 years of experience. Nearly 30% of the respondents were teachers with 19 or more years of experience, while less than 4% of the respondents were first-year teachers. Participants were asked whether they had heard of AITC, and 83% of respondents indicated they had never heard of AITC. When asked on the survey if they had ever used AITC materials in their class, 93.4% of respondents indicated they had not ever used AITC materials. When examining the 17% of teachers who had indeed heard of AITC, approximately 10% of them had never used AITC resources in their classes.

Objective two sought to determine teachers' perceived importance of agriculture by demographic characteristics. Overall, respondents overwhelmingly agreed that agriculture is important for their students to know about ($M = 3.30$, $SD = 0.43$). Of those who responded to this construct ($n = 406$), more than 92% agreed or strongly agreed with each of the statements, indicating elementary teachers perceive agriculture to be important for their students to learn about. A multiple linear regression was utilized to determine how demographic characteristics (independent variables) of elementary teachers predicts perceived importance of agriculture to their students (dependent variable). Both independent variables, in combination, comprised a significant model ($F = 7.92$; $p < .05$) and predicted only 4.4% ($R^2 = .044$) of the variance in importance of agriculture (see Table 2). Grade level taught was the only significant predictor of elementary teachers' perceived importance of agriculture.

Table 2*Relationship Between Importance of Agriculture and Teacher Characteristics*

Dependent Variable: Importance of Agriculture						
Variable ₁	Zero-order correlation (<i>r</i>)	<i>p</i> -value	<i>B</i>	<i>SEB</i>	β	<i>p</i> -value
Grade Level Taught	.094	.078	.025	.014	.096	.000
Years of Teaching Experience	.164	.001	.034	.010	.185	.067

Note. $R = .209$, $R^2 = .044$, $F = 7.92$

* $p < .001$

Objective three was to determine teachers' interest in agriculture-related resources for use in their classrooms by demographic characteristics. A four-point Likert-type scale was used to measure elementary teachers' interest in agriculture-related curriculum. Overall, elementary teachers in this study agreed they were interested in agriculture-related resources ($M = 3.00$, $SD = 0.54$). Teachers in this study were most interested in receiving free curriculum materials in their classroom and agricultural related lesson plans that meet educational standards (see Table 3). Teachers were least interested in a quarterly newsletter about agriculture that could be used in their classroom.

Table 3*Elementary Teacher Interest in Agriculture-Related Resources (n = 404)*

I would be interested in...	Strongly Disagree		Disagree		Agree		Strongly Agree		<i>M</i>	<i>SD</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
Receiving free curriculum materials to use in my classroom.	4	1.0	18	4.5	216	53.5	166	41.1	3.35	0.61
Agriculture related lesson plans that meet current required educational standards.	3	0.7	21	5.2	254	62.7	127	31.4	3.25	0.58
Lesson ideas regarding agriculture that I could print off of a web site.	5	1.2	43	10.6	264	65.2	93	23.0	3.10	0.61
CD containing hands-on lesson plans and activities.	11	2.7	76	18.8	226	55.9	91	22.5	2.98	0.72
Using an interactive, agriculture related web site that provided grade level lesson ideas.	9	2.2	77	19.1	234	57.9	84	20.8	2.97	0.70
A quarterly newsletter regarding agriculture that I could use in my classroom.	7	1.7	88	21.8	234	57.9	75	18.6	2.93	0.69

A multiple linear regression was utilized to determine the relationship between demographic characteristics (independent variables) of elementary teachers and their interest in agriculture-related resources (dependent variable). Both independent variables, in combination, comprised a significant model ($F = 3.95$; $p < .05$) and predicted only 2.2% ($R^2 = .022$) of the variance in interest in agriculture-related resources (see Table 4). Grade level taught was the only significant predictor of elementary teachers' interest in agriculture-related resources. Results indicate that interest in agriculture-related resources increased as grade level increased. Although not a significant predictor at ($p < .05$), the zero-order correlation is statistically significant, ($p < .05$), suggesting as teachers become more experienced, they become less interested in agriculture-related resources (see Table 4).

Table 4

Relationship Between Interest in Agriculture-Related Resources and Teacher Characteristics

Dependent Variable: Interest in Agriculture-Related Resources						
Variable ₁	Zero-order correlation (<i>r</i>)	<i>p</i> -value	<i>B</i>	<i>SEB</i>	β	<i>p</i> -value
Grade Level Taught	.106	.047	.035	.017	.110	.039
Years of Teaching Experience	-.109	.030	-.023	.012	-.101	.057

Note. $R = .149$, $R^2 = .022$, $F = 3.947$

* $p < .05$

Conclusions/ Implications/ Recommendations

The purpose of this study was to determine the perceptions of elementary teachers regarding the integration of agriculture-related resources (e.g., AITC) into their classrooms. In terms of the innovation of integrating agriculture-related curriculum, the results of this research suggest that the majority of teachers who participated in this study were situated in Stage 0 (Awareness) or Stage 1 (Informational) with very little awareness or involvement regarding AITC (Hall & Hord, 2006). Very few elementary teachers from this study had ever heard of or had used AITC resources. This is discouraging, especially as the agri-food system continues to be criticized and the need for agriculturally literate citizens is so critical (Powell et al, 2008). On a positive note however, our findings indicate that of those 17% that had indeed heard of AITC, about 90% of them had used or were currently using AITC resources in their classrooms. This finding shows that perhaps when teachers do simply know about AITC, they are more likely to use it. This also suggests that as teachers are exposed to AITC resources and become more familiar with the materials, they may make decisions that will move them through the developmental *Stages of Concern*.

The implications of these findings further suggest a need for greater efforts by AITC professionals to market and engage elementary teachers in this study area with their programming. While these results are not generalizable, we urge readers to consider how the recommendations may apply in their own context. We suggest marketing efforts for AITC staff might include, scheduling visits to attend school staff meetings to introduce the program and resources to teachers and principals; visiting with or providing guest lectures to elementary and secondary pre-service teachers, introducing them to AITC programs and resources; participating in local meetings, conferences or events that in-service teachers would attend; and, branding of AITC resources appropriately and consistently to ensure that teachers easily identify AITC resources they might use.

Objective two sought to determine teachers' perceived importance of agriculture and AITC resources by demographic characteristics. Our findings suggest that teachers do understand the importance of agriculture (Knobloch et al., 2007) and are interested in ways to integrate it into their classroom teaching, but perhaps there are barriers to integration which include 1) lack of self-efficacy to integrate it without guided resources, and 2) lack of awareness of AITC resources. It is also possible, these teachers feel pressure from increased accountability through standardized testing and overcrowded curriculum (Daggett, 2000; Linn, 2000; Spring 2008) thus, they do not want to add anything additional to their curriculum. Additional research should examine these variables more closely in relation to why teachers may choose not to integrate agriculture in their curriculum, even when resources and training are provided.

We found that the higher the grade level taught, the more teachers perceived agriculture and teaching students about agriculture as important. Perhaps teachers in the lower-level grades are indeed caught up in the pressures of helping students develop reading, writing, and math literacy that they have little time left in their schedules to focus on anything else, whereas those teaching upper level elementary grades have more curricular options available to them. The topics in which higher elementary grade teachers can embark on are possibly more congruent with integrating or contextualizing agriculture in their classrooms on a more consistent basis. AITC professionals should consider the subtle differences by grade level among elementary teachers as they work to market and deliver products and training.

Objective three sought to determine teacher interest in agriculture-related resources for use in their classrooms by demographic characteristics. Overall, elementary teachers in this study reported moderately high levels of interest in obtaining and using agriculture-related resources. Additionally, teachers in this study were most interested in free materials that meet educational standards and less interested in regular periodicals, such as a newsletter. These findings further indicate the need for AITC professionals to improve the marketing and branding of their products and resources, so a greater number of elementary teachers can integrate agriculture in their curriculum. Our findings also show that as elementary grade level increases, so does the teachers' interest in obtaining agriculture-related resources and curriculum. This again confirms the idea that perhaps higher elementary grade teachers perceive more flexibility within their curriculum and are therefore more interested in integrating agriculture in their classrooms on a more consistent basis. Our findings also show, however, that more experienced teachers are less interested in the curriculum. This finding is interesting and implies that as elementary teachers become more experienced, they perhaps get set in their ways or already have many resources at their disposal and do not see the need for changes to their teaching practice. Moving teachers from the lower stages of concern (e.g., awareness, informational, personal) to higher stages of concern (e.g., management, consequences, collaboration, refocusing) therefore may be more challenging with experienced elementary teachers. Perhaps this is because the perceived benefits of integrating agriculture into their curriculum (Knobloch et al., 2007), does not outweigh the barriers associated with *Stage 3-Personal Concerns* (Hall & Hord, 2006), such as lack of personal time or overcrowded curriculum (Daggett, 2000). Even though teachers in this study overwhelmingly indicated agriculture as important, perhaps they question whose responsibility it is to ensure agricultural literacy among their students. It is possible that many elementary teachers believe the responsibility to produce agriculturally literate citizens is someone else's and do not see agriculture as a way to contextualize educational standards

Although we suggest the findings of this study can inform many across the country, we acknowledge the results of this study can only be generalized to the population of teachers in this study. Therefore, we recommend replication of this study in other populations of teachers, perhaps on a national scale, to provide more generalizable results for the profession. Furthermore, teaching experience and grade level only accounted for about 4% and 2% of the variance in perceived

agricultural importance and interest respectively. Therefore, research is recommended to determine what other factors account for the remaining variance in importance and interest. Research would also be useful to determine to what extent accountability and standardized testing initiatives have on teachers' interest and ability to integrate agriculture in their curriculum. The findings of this one study can only lead us to speculation. Finally, more research is recommended to determine increases of agricultural literacy among students whose teachers utilize and integrate AITC materials in their classrooms.

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