

Program Needs of Middle School Agricultural Education Teachers: A Delphi Study

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This study examined program needs of middle school agricultural education teachers in North Carolina. A three-round Delphi technique used two open-ended questions to collect information from an expert panel of middle school agricultural education teachers. Each panel member was asked to respond to: Question one: "What can be done on the local, state and national levels to improve middle school agricultural education programs?" Question two: "When looking at the three circle model for agricultural education, what improvements can be made for middle school agricultural education related to FFA, Supervised Agricultural Experience (SAE), and classroom instruction?" Panel members identified 29 areas of concern on the local, state, and national level and 19 areas related to FFA, SAE, and classroom instruction. Middle school agricultural education teachers in [State] believe that the curriculum for their students should contain more hands-on activities and should have a stronger agricultural focus. This panel of teachers also revealed that there are many more concerns with FFA activities for middle school students than there are for SAE and classroom instruction.

Keywords: middle school agricultural education, middle school agricultural education teachers, middle school agricultural education programs

Introduction/Theoretical Framework

The middle school agricultural education program is the starting point for many students to explore industries and occupations associated with food, fiber and natural resources (National Council for Agricultural Education, 2002). Middle grades agricultural education programs are important to the total agricultural education profession because they are often the initial point of contact for students who have an interest in the agricultural industry.

There are approximately 1652 middle school agriculture teachers in the United States (Kantrovich, 2007). Of these, 427 teaching exclusively at the middle school level. These instructors teach a mixture of agricultural technology and career exploration topics to approximately 70,000 middle school students enrolled in agricultural education. Approximately 30,000 of these students are members of the National FFA Organization (National FFA Organization, 2002).

Middle schools possess neither the characteristics of an elementary school nor those of a high school, and yet are charged with the responsibility of paving a smooth path for students to transition successfully from elementary school to high school. To accomplish this, the middle school teacher takes on a different role than the elementary school teacher (Croom, 2006). This teacher assumes the task of helping students discover knowledge as opposed to being the giver of knowledge. Teachers often work in disciplinary teams to deliver the curriculum by planning courses together, and rotating students through the subjects taught by the team during the school day (George, Lawrence, & Bushnell, 1998). The middle school curriculum is flexible and emphasizes personal development. It reinforces basic math and language skills, and begins the process of revealing to students the specific knowledge within subject areas (Rutter, Maughan, Mortimer, Ouston, & Smith, 1979).

The theoretical framework for this study was based on Erikson's Social-Emotional Development Theory and constructivist theory. Erik Erikson identified human socialization as an eight-stage process with each stage arriving as the result of an internal need that must be met in order to reach the intended result. The first stage in Erikson's Model is from birth to the second year of life, and is characterized by the individual learning to trust others. In stage two, ages two to four, the individual begins to develop a need for autonomy, and a child's need to be assertive. Erikson identified the third stage as the "play" stage where children learn to imagine and play cooperatively with other children (Erikson & Coles, 2000).

Erikson's fourth stage begins sometime around the age where the child goes to school. In stage four, the child begins to master peer relations, cognitive skills in reading and math, and the complex rules associated with formal play and organized recreation. Children are likely to enter middle school during this stage. Erikson's fifth stage is just beginning as the child departs from middle school. It is characterized by a need to develop a unique identity. After the middle school years, individuals proceed toward young adulthood where they hone their sense of identity in preparation for developing love relationships with others. In middle adulthood, they build upon their intimate relationships by becoming care-givers through parenting and mentoring. In Erikson's final stage of human growth and development, adults come to terms with their existence by reflecting on their lives in a positive manner (Erikson & Coles, 2000).

Erikson offered theories about the cognitive, social, and emotional development of adolescents. These theories explain what subject matter is developmentally appropriate for adolescents. However the question still remains, "How do adolescents learn?" John Locke (1632-1704) explained learning in this manner; all humans are born with a mind like a blank sheet of paper, a *tabula rasa*. As humans experience things (nature, weather, etc.) the mind begins to write knowledge upon this blank page. Locke proposed that all of our knowledge and understanding arises out of prior experiences (Magee, 2001). Similarly, constructivists propose that all knowledge arises out of previous knowledge, regardless of how an individual is

taught (Bransford, Brown, & Cocking, 1999). Learning is enhanced when teachers recognize the knowledge and beliefs that students bring to class, and when they use this prior knowledge to teach new concepts (White & Frederickson, 1997, 1998). Early vocational education efforts emphasized realistic training identical to vocational experiences outside of school (Talbert, Vaughn, & Croom, 2005). Thorndike (1913) proposed that the success of the learning experience was dependent upon how closely the in-school experiences and out-of-school work experiences are matched.

To create valuable learning experiences, middle grades teachers must have a positive disposition toward adolescents as evidenced by their enthusiasm in teaching, their respect for adolescents, and their realistic and challenging expectations of students (National Middle School Association, 2002). Instructional strategies used by teachers to make content meaningful to students include accessing prior knowledge in students by examining the similarities and differences between subject matter and the students' own personal experiences, summarizing information periodically during a lesson, providing positive reinforcement, setting individual learning goals, and providing a structure for feedback (Hunter 1967, 1971; Marzano, 2003).

Teachers should focus instructional efforts on three major areas: career exploration, agricultural literacy and guided personal development. Because of the vast number of agricultural occupations available to high school and college graduates today, it is essential that students receive a concentrated and directed study of agricultural careers at some point before graduating from middle school. An effective middle school curriculum offers students the opportunity to learn about agricultural careers, and some of the skills needed in those careers (Talbert, Vaughn, & Croom, 2005, National FFA Organization, 1996, Frick, 1993).

FFA leadership programs should equip students with the capability to envision their preferred future and take action to bring their vision to fruition. FFA members learn the importance of continuous personal improvement and awareness of social and environmental issues through leadership development activities. The development of positive relationships with others is another essential ingredient that allows

the FFA leader to get things accomplished. Without a network of supportive individuals, leaders often find leading a very difficult task (Croom, 2003).

Rossetti and McCaslin (1994) found that students had a greater understanding of agriculture and were more likely to be informed about careers in agriculture than students who were not enrolled in a middle grades agricultural education program. If the student chooses to continue to take agriscience courses in high school, the supervised agricultural experiences he or she began in middle school can blend into a high school supervised agricultural experience program (Talbert et al., , 2005). Middle grades students enter into supervised agricultural experiences that are exploratory, experimental, or analytical and can develop an individual program that combines two or more supervised agricultural experience elements.

Providing agricultural education programs for middle school students is a noble idea, but how effective are middle school programs? How do middle school agricultural education teachers view the local, state, and national status of their programs? Has the agricultural education profession placed sufficient emphasis in and resources on the growth of development of middle grades education?

Purpose and Objectives

The purpose of this study was to identify areas of concern among middle school agricultural education teachers regarding the status of middle school agricultural education. The objective of the study was to identify areas on the local, state, and national level within FFA, SAE and classroom instruction that need improvement.

Methods

A three-round Delphi technique was used to conduct this study. The Delphi technique is a group process designed to solicit expert responses toward reaching consensus on a particular problem, topic, or issue (Delp, Thesen, Motiwalla, & Seshadri, 1977). According to Linstone and Turoff (1975) “the Delphi technique may be characterized as a method for structuring a group so that the process is effective in allowing a group of

individuals as a whole, to deal with complex problems” (p. 13). The Delphi method allows a group to reach consensus on a certain concept without bringing the subjects in personal contact with each other (Akers, 2000).

The panel of experts consisted of middle school agricultural education teachers in North Carolina. These teachers were selected as experts because they were currently teaching middle school agricultural education in North Carolina. Thirty-five teachers were invited to participate in the initial round of the survey. Seventeen teachers agreed to participate in the study and replied to the first round of the survey. According to Dalkey (1969), when the group size for a Delphi study is larger than 13, the reliability is higher than .80.

In the first round of the survey an instrument was mailed to the panel of experts. This instrument consisted of two open-ended questions designed to generate a variety of responses. Question one: “What can be done on the local, state, and national levels to improve middle school agricultural education programs?” Question two: “When looking at the three circle model for agricultural education, what improvements can be made for middle school agricultural education related to FFA, SAE, and classroom instruction?” The questions were validated by a panel experts made up of four university faculty and two state agricultural education leaders for content and face validity. A list of all responses was compiled and three independent readers collapsed the responses into similar categories. Responses from the first question were categorized as: curriculum, facility, professional, youth development, or school system issues. Responses from the second question were categorized as FFA, SAE, or classroom instruction.

In the second round, the panel of experts was sent a web-based survey and asked to rate the responses from round one on a four-point Likert-type scale (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree). The researchers determined *a priori* that only those factors reaching 80% consensus from the panel would be used as factors when developing instrumentation for future rounds. Consensus of an item was determined by 80% or higher level of agreement on the four-point Likert-type scale. The panel was notified after each subsequent round of the level of agreement on

factors reaching 80% consensus or higher. Factors that failed to reach 80% consensus were resubmitted to panel members for further consideration. The researchers used Dillman's Tailored Design Method (Dillman, 2000) to solicit responses. All 17 panel members from round one replied to the round two survey. Frequencies, percentages, and ranks were used to evaluate the second round responses.

In round three, the items that reached 80% consensus in the previous round were set aside. Only the items that failed to reach 80% consensus were included in round three. Eight items generated from question one of the initial survey were included in round three. Three of these were curriculum issues, three were school system issues, one was related to facilities, and one to youth development. Six items generated from question two of the initial survey were included in the third round. Four of those were FFA related issues, one was related to SAE and the final was a classroom instruction issue. Frequencies, percentages, and ranks were used to evaluate the third round responses. Fourteen panel members from the previous rounds responded to the final round of the survey yielding a 78% response rate for the final round. Due to the remaining factors failure to reach consensus of 80% or higher in round three, the researchers determined a sufficient degree of consensus had been attained. No further iterations were necessary.

Findings

The first open-ended question: "What can be done on the local, state, and national levels to improve middle school agricultural education programs?" produced 12 areas of concern related to curriculum with nine items reaching

80% consensus in round two. All seven issues middle school teachers face on a professional level reached an 80% or higher level of agreement among panel members. Six areas related to their respective school systems were identified in round one with three reaching consensus in round two and three being carried over to round three but failing to reach consensus. Two issues regarding facilities were noted with one reaching consensus from the panel members and the other moving to the third round of the survey. Finally, two issues related to youth development arose with one reaching consensus in round two and the other being moved to the final round. A total of 21 items related to improvement of middle school agricultural education reached 80% or higher consensus among panel members.

In the area of curriculum, North Carolina middle school agricultural education teachers believe the curriculum should be more hands-on and activity based. This group of teachers also believed that political squabbling over curriculum development should end. On a professional level, middle school agricultural education teachers in North Carolina believe that their school administrators should be educated on the importance of middle school agricultural education programs and these teachers should be offered some type of extended year contract. These teachers also felt that students should be held accountable for performance in agricultural education classes at the middle school level. These teachers identified the need for better equipment and materials for their programs and a need for more career development events for their students who join FFA. Table 1 displays round one categorized responses that reached 80% or higher level of agreement among panel members in round two of the survey.

Table 1

<i>Responses Related to Improvement of Middle School Agricultural Education Programs</i> Categorized Response	Round Two Percent Agreement
Curriculum	
Curriculum should be more hands-on and activity based	95.7
Remove political squabbling over curriculum development	94.0
Specific curriculum for 6th, 7th, and 8th grade	86.7
Wider variety of courses to meet needs of rural and urban students	85.2
Make the middle school biotech course an elective (retain interested students)	85.2
Improve middle school curriculum	84.7
Curriculum needs stronger focus on agriculture	84.7
Develop exploring curriculum based on (ag commodities, animals, plants)	83.7
Develop introductory course for 6th graders	82.0
Professional	
Educate school administrators on the importance of middle school programs	94.5
11 month contracts so teachers can participate in summer activities	87.5
More networking among current middle school teachers	86.7
More in-service for middle school ag ed teachers	86.0
Complete listing of all middle school teachers and programs (e-mail addresses)	86.0
Treat middle school teachers the same as high school teachers (neglected, not included)	83.2
Improve recognition for middle school programs (FFA Foundation for high school)	81.7
School System	
Students should be held accountable for performance in these classes	90.2
Middle schools should feed into a high school program	84.5
More interaction between middle and high school programs	83.2
Facility	
Better materials and equipment for middle school programs	89.0
Youth Development	
More career development events for middle school FFA members	80.5

Note. Percentages are derived from the frequency of participant responses on a 4-point scale (1 = strongly disagree, 4 = strongly agree).

Eight items from the first open-ended question, "What can be done on the local, state, and national levels to improve middle school agricultural education programs?" failed to reach 80% consensus among panel members. These items were resubmitted to panel members for further consideration in round three. Offering a

week of FFA camp specifically designed for middle school students was the only item that moved to consensus from round two to round three. Table 2 shows categorized responses with round two and round three percentage of agreement.

Table 2

<i>Responses Related to Improvement of Middle School Agricultural Education Programs Not Reaching 80% Consensus</i>	Round Two Percent Agreement	Round Three Percent Agreement
Curriculum		
More opportunities for exploration (not mini-high school programs)	79.2	79.7
Expand curriculum with more agriculture emphasis and less biotechnology emphasis	72.7	71.0
More consistency state wide on course design (9 weeks)	73.5	73.5
School System		
Lower class size	73.5	75.0
Increase class time (38–42 minutes is not enough)	70.7	73.5
Students not interested in agriculture are forced to take class	68.0	68.7
Facility		
Design classrooms for agriculture education, not science	79.0	78.2
Youth Development		
Offer a week of middle school FFA camp	79.7	*82.0

Note. Percentages are derived from the frequency of participant responses on a 4-point scale (1 = strongly disagree, 4 = strongly agree). Asterisk * indicates the item that reached consensus in round three.

The second open-ended question: “When looking at the three circle model for agricultural education, what improvements can be made for middle school agricultural education related to FFA, SAE, and classroom instruction?” produced nine areas of improvement for middle school FFA activities with five reaching consensus in round two. Six areas of improvement for middle school SAE were

identified with five reaching 80% or higher level of agreement in round two. Four areas of improvement for classroom instruction surfaced with three of those reaching consensus in round two of the survey. Table 3 contains categorized responses that reached 80% or higher level of agreement among panel members in round two of the survey.

Table 3

<i>Responses Related to the Three Components of the Agricultural Education Program</i> Categorized Response	Round Two Percent Agreement
FFA	
More recognition on regional state level for middle school FFA accomplishments	83.7
Make career development events more middle school friendly	81.7
Club time during school day for FFA	81.2
True middle school CDEs not junior events where middle school competes against 9th graders	80.7
Financial support for FFA programs in low income areas (dues)	80.5
SAE	
Develop SAE shadow experience	86.7
Scaled down version of SAE for middle school students	86.7
Share ideas for creative SAEs	85.7
SAE is tough to establish in 9 week grading period	85.0
Make SAE more user friendly for middle school students	82.7
Classroom Instruction	
Funding for large purchases (materials & equipment) less available for middle school	86.0
Middle school and high school instruction should provide students the same opportunities (greenhouse)	84.5
Instruction and curriculum should be more exploratory in nature	81.7

Note. Percentages are derived from the frequency of participant responses on a 4-point scale (1 = strongly disagree, 4 = strongly agree).

Six items from the second open-ended question, "When looking at the three circle model for agricultural education, what improvements can be made for middle school agricultural education related to FFA, SAE, and classroom instruction?" failed to reach consensus in round two of the survey. These

items were resubmitted to panel members in round three for further consideration. None of the remaining items moved to 80% consensus among panel members. Table 4 shows categorized responses with round two and round three percentage of agreement.

Table 4

<i>Responses Related to the Three Components of the Agricultural Education Program Not Reaching 80% Consensus</i> Categorized Response	Round Two Percent Agreement	Round Three Percent Agreement
FFA		
Offer middle school proficiency awards	79.0	79.7
On-line course for middle school teachers on FFA programs	79.0	79.7
National FFA should recognize 6th graders as active members	76.2	78.2
FFA events for urban middle school students	76.2	76.5
SAE		
Create more SAE opportunities for middle school students	76.5	78.2
Classroom Instruction		
Instruction for biotechnology curriculum is hard (too advanced for middle school)	66.5	67.2

Note. Percentages are derived from the frequency of participant responses on a 4-point scale (1 = strongly disagree, 4 = strongly agree).

Conclusions

Results from this study are limited in terms of generalizability with all of the respondents being from one state. Another limitation to the study is that some issues/concerns posed by this group of teachers are localized in nature. According to this panel of middle school agricultural education teachers, there is significant room for improvement in the middle grades agricultural education curriculum. These teachers would like for the curriculum to access the advanced psychomotor skills and higher order thinking skills of students while focusing on authentic agriculture content, particularly in the area of marketing, animal science, and plant science. The panelists also prefer to reach an agreement between the state department of public instruction and the state leadership for agricultural education with regard to the future direction for middle grades agricultural education.

The panel members believe that school administrators should be more informed about the importance of their agricultural education programs. This is likely a marketing and perception problem faced by most agricultural education programs in the state, and not totally confined to middle school agricultural education. Middle school agricultural education teachers in North Carolina also believe they should be rewarded with extended year contracts for FFA activities and SAE supervision. They believe there should be more in-service for their specific group which would give them more opportunities to network with their colleagues. In other words, middle school teachers want the same respect and opportunities as their high school colleagues.

With regard to FFA and SAE programming, panelists would like to see more depth to the FFA program and less depth in the SAE program. FFA programs need to be more flexible and designed for the middle school audience. This may mean having more FFA activities during the normal school day, and establishing more introductory level FFA career development events. SAE, on the other hand, should be scaled back to a level that allows middle graders to explore lots of different career options. The current year-long approach to SAE program development may not be a viable

alternative at the middle grades level because teachers may only be able to supervise students for one nine week period during the year. With regard to the profession of teaching, panelists would like for their students to be more accountable for their performance in class with greater academic emphasis being placed on agricultural education classes. A high percentage of these teachers wish that their facilities and equipment were more up to date.

Discussion and Recommendations

Middle school agricultural education programs are the headwaters for high school agricultural education programs. Students who discover the new world of agricultural science in the middle school classroom may choose to continue their journey into this new world by enrolling in the high school agricultural education program. The middle school program can be an important place for students to begin to make decisions about their life and career goals. Yet this study raises important questions about the present status of middle grades agricultural education. Specifically, how does curriculum measure up against what we know about the growth and development of adolescents? How can the program be structured so that curriculum and instruction, FFA and SAE components are developmentally appropriate for students in the middle grades? These are the questions in the minds of middle school agricultural education teachers.

The panelists generated twice as many concerns related to FFA activities as they did for classroom instruction, indicating that middle school FFA programming is a prime area for improvement. Panelists indicated that FFA offers many opportunities for student recognition which may have the indirect benefit of providing recognition for the accomplishments of teachers. Teachers and students tend to view FFA as the "fun" part of agricultural education, and this may be the motivation for many students to enroll in agriculture classes. With leadership development, competition, team participation and travel opportunities, FFA may be the best hope for getting students "turned on" to agricultural science careers. Perhaps FFA can do

this even better than SAE can for middle school students.

Panelists indicated that SAE was much more challenging to involve middle school students in than FFA activities. Perhaps this is not so much an indictment of the agricultural education profession's failure to promote and encourage SAE as it is an indication of what teacher's value. A number of studies point towards the need for a middle school curriculum that helps students begin developing career aspirations. Yet agricultural educators may still view SAE programs as entrepreneurial and production-oriented, and use this view to explain why their students do not have SAE's in middle school. If we can believe Erikson's theory of social development, middle school students are not developmentally capable of making business management decisions. In middle school agricultural education, job placement opportunities are hindered by the age and maturity level of middle graders. The structure of most middle school agricultural education programs is such that students only receive nine weeks or a semester of instruction and this makes it difficult to establish a long-term supervised agricultural experience program. The teachers in this study noted the difficulties associated with establishing an SAE project in that short length of time. While some state FFA associations have implemented proficiency awards for middle school students, there is no national emphasis on middle school proficiency awards. So, it would be easy for the middle school teacher to argue against a strong SAE program in their school. That is, if teachers are willing to ignore the recent trends in supervised agricultural experience like the development of scientifically-based research projects, service learning, and volunteer activities designed to improve communities. Even the concept of exploratory SAE, an old idea relatively speaking, it can be useful at the middle grades level. SAEs may not be able to close the gap between middle school and secondary agricultural education programs, but it certainly has the potential to smooth the rough pavement between the two by introducing students to concepts that they will explore more in depth at the high school level.

This study also surfaced a few concerns about program administration. Inadequate resources, lack of facilities, high student-teacher

ratios, and various economics factors were all cited as barriers to the total agricultural education program. Perhaps these concerns arise out of the natural evolution of agricultural education programs. Teachers are exploring new and innovative ways to improve instruction, SAE, and FFA activities, and these concerns arise out of an understanding of the present condition of the program as it relates to some preferred condition in the future. If the profession embraces the concept of problem-solving instruction, then it must work to develop strategies that middle school agricultural education teachers can use to improve instruction, FFA, and SAE at the middle school level.

Based on the findings of this study, the researchers concluded that there are many issues facing middle school agricultural education teachers that warrant future study. Before the agricultural education profession proposes a growth plan that advocates the creation of many new middle school agricultural education programs, we should listen to the concerns of our existing middle school educators and work to fill in the gaps that are currently exist on the local, state, and national level related to FFA, SAE, and classroom instruction.

Further Research

Given the results of this study, there are many recommendations for further research. Replication of this study on a national level would be helpful in identifying areas of concern that have broader implications. A study of this nature would clarify many of the FFA and SAE concerns identified by the teachers in this study and would help eliminate those issues that were specific to this particular state. The use of more extensive qualitative methods in this area of research may yield valuable data. Conducting focus groups for middle school agricultural education teachers at national and regional NAAE conferences could provide a richer and more thorough description of the challenges faced by middle school agricultural educators.

Curriculum concerns were a consistent theme in this study. With the development of many new curricular choices in agricultural education, have we addressed any of these concerns? Do the new curriculum models address the needs of middle school students at a

developmentally appropriate level? Future research is needed to examine the effectiveness and appropriateness of the latest curriculum developed for the middle grades audience in agricultural education.

The three circle model for agricultural education has long been the signature for our discipline. Another avenue for further research is exploring a new model for middle school

agricultural education. Many teachers reported that there programs looked like “mini high school programs.” Will a different model for middle school agricultural education eliminate this stereotype and help to expand this program into a more viable choice for exploratory class offerings in urban and suburban areas looking to expand their curriculum?

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