# Skills for Agricultural Science Teachers: School Administrator's Perspectives

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## ABSTRACT

**This study was conducted in order to assess what skills school administrators deem important for the Agricultural Science teachers to possess and what level of importance they place on each skill. The collection of data for this study took place in May 2000. The data collection instrument consisted of a direct mail questionnaire containing 49 separate phrases in regard to teachers' skills. The questionnaire was sent to all public school superintendents in 128 districts in Educational Service Center Regions 8 and 10. The skills were rated on a five point Likert-type scale with 1 being *Unimportant* and 5 being *Essential* and ranked according to their mean score. The study revealed that administrators perceive skills in the areas of leadership development and supervised experience programs, service to special populations, and instructional management as the most important skills needed by Agriculture Science teachers. Skills in production agriculture and natural resources were perceived as less important.**

**KEYWORDS:** Agricultural science teachers, school administrators, teacher skill, teacher knowledge

The National Council for Agricultural Education (2001) defines agriculture education today as "a systematic program of instruction available to students desiring to learn about science, business, and technology of plant and animal production and/or about the environmental and natural resources system" (p. 1). The mission for agricultural education involves preparing students for careers and informed choices in agriculture, food, fiber, and natural resources systems. Agricultural educators attribute supervised experience programs (SEPs), classroom and laboratory instruction, and student participation in leadership organizations as a complete educational program in agriculture (National Council for Agricultural Education 2001, Stagg and Staller 1999).

Most people associate agriculture education today with livestock shows, leadership, and the National FFA Organization. The FFA continues to play a vital role in agricultural education since its establishment in 1928. According to Vaughn, Kieth, and Lockaby (1999), the FFA was established to allow competition between students in order to build self-esteem, develop social skills and values in the young, and keep vocational agriculture in the public schools system. Many agricultural educators believe that without the establishment of FFA, there would be no agricultural education in the public school system.

There have been many transitions in agricultural education since its beginning. Most notable are the changes from yearlong courses to semester courses, from manual food production to food technology and agribusiness, and from production projects to

applied activities. There are also new requirements for secondary teachers and new curricula for the agricultural student. New curricula for Texas agricultural students include twenty-seven semester agriscience and technology courses. Larke and Norris (1988) stated that due to the continued change of Texas agricultural science curriculum, teachers have had to adapt to teaching unfamiliar curriculum in their classrooms.

Researchers have attempted as far back as the late 1880s to identify specific criteria that produce the most effective agricultural science teacher (Miller, Kahler, and Rheault 1989). Swortzel (1995) identified the following six roles as the primary criteria for the twenty-first century agricultural educator: facilitator of learning, understander of the learner, program developer, administrator, professional educator, and role model/mentor. However, because of the dramatic changes in agriculture, the fluctuation of content in agricultural education courses, and the changes in student enrollment related to agricultural courses, the role of the Agricultural Science teacher is difficult to put into one single definition.

The purpose of this study was to determine and identify what skills and roles Agricultural Science teachers should possess as perceived by school administrators and assess what level of importance they place on these skills.

## MATERIALS AND METHODS

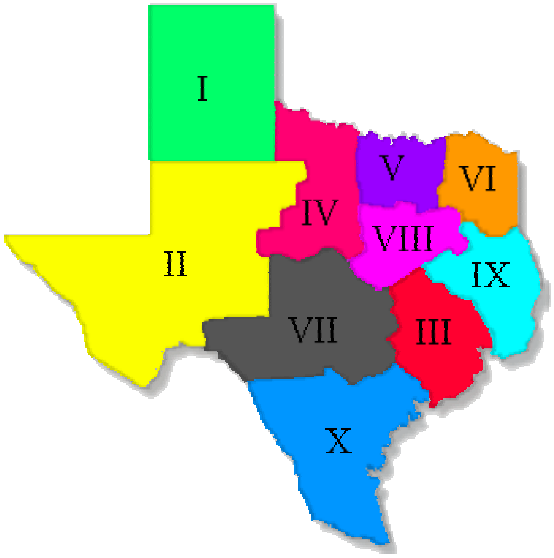
This study was conducted in order to determine what skills school administrators deem most important for Agricultural Science teachers and what level of importance they placed on these skills. The study was conducted in May 2000. It consisted of a direct mail questionnaire sent to all public school superintendents in 128 school districts in Texas ESC Regions 8 and 10 (Figure 1). The questionnaire contained 49 separate phrases pertaining to Agricultural Science teachers' skills. The skills were rated by each respondent on a Likert-type scale.


(adapted from Texas Education Agency, http://www.tea.state.tx.us/ESC/ )

Figure 1. Educational Service Center Regions in Texas with Service Center Location

The population consisted of all public school systems in the Texas ESC Regions 8 and 10. The characteristics of the school districts were varied. Some of the school districts had multiple high school campuses while others consisted of a single campus. A small proportion of the school districts had middle school programs. There were also districts with no Agricultural Science program.

The sample consisted of the superintendent or his/her designee from 48 school districts in ESC Regions 8 and 80 school districts in ESC Region 10. All of the school districts in ESC 8 were representative of Agricultural Science programs in Area VI FFA (Figure 2). School districts in ESC Regions 10, with the exception of seven districts in Ellis County, are representative of programs in Area V FFA (Figure 2).




(adapted from Texas FFA, http://www.txaged.org/tfa-news.html)

Figure 2. Texas FFA Areas

The instrument consisted of 49 separate phrases to complete the sentence, "Agricultural Science teachers should be able to…" Each phrase was followed by a five-point Likert-type scale ranging from 1 (Unimportant) to 5 (Essential). Although not specifically expressed on the instrument, reviewers indicated that they understood that the higher the rating on the 1-5 scale, the more important the skill was.

Gay (1996) defined validity as "the degree to which a test measures what it is supposed to measure" (p. 624). Content validity of the instrument was based on an extensive review of literature related to administrators' and other agriculture stakeholders' perceptions of Agricultural Science teachers' responsibilities (Flint 1979, Nowadnick 1979, Cox and Zubrick 1986, Kotrlick and Drueckhammer 1987, Foster, Bell, and Erskine 1995, Russell, 1999).

Prior to data collection, a group of preservice and inservice Agricultural Science teachers and a former school administrator reviewed the instrument for content, readability, and applicability to the profession. Suggestions were considered and slight revisions were made to the instrument.

The collection of data occurred through a direct mail questionnaire using the previously discussed instrument. The questionnaire was sent to all public school

superintendents in ESC Regions 8 and 10 during May of 2000. The superintendent of each district was mailed a cover letter explaining the purpose of the study, along with the questionnaire and a business reply envelope for returning the completed questionnaire. In the cover letter, superintendents were asked to complete the questionnaire or forward it to the administrator who was most familiar with the Agricultural Science program(s) in the district. The position of the person actually completing the questionnaire was unknown since the responses were anonymous.

A data collection period of six weeks was allowed for the questionnaire to be returned. Sixty-one were returned providing an overall response rate of 47.66%. Since no attempt was made to control for non-response error, generalization of these findings beyond the accepting sample should be made with caution. Data were analyzed to answer the following research question.

What level of importance do school administrators place on skills related to:

a. production and natural resources methods,
b. agricultural mechanization,
c. youth leadership development and SEPs,
d. instrument management,
e. information technology,
f. serving special populations, and
g. program and professional development?

Data were analyzed with Statistical Package for the Social Sciences (SPSS) version 10.0.

## RESULTS AND DISCUSSION

The level of importance the school administrators placed on each skill is addressed in separate tables where each of the 49 skills have been placed in categories pertaining to one of the following curriculum areas: a) production and natural resources methods, b) agricultural mechanization, c) youth leadership development and SEPs, d) instructional management, e) information technology, f) serving special populations, and g) program and professional development.

The importance of skills ranked by school administrators in production and natural resource methods can be evaluated in Table 1. *Explain current farm production practices* ranked as highest priority followed by *select livestock for show projects* as second highest priority. Administrators ranked *select and apply pesticides* as the lowest priority.

Table 1. Summary of Responses to Production and Natural Resources Methods (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Explain current farm production practices | 4.15 | 0.83 |
| Select livestock for show project | 4.10 | 0.91 |
| Perform livestock skills | 4.02 | 0.92 |
| Clip/groom livestock for shows | 3.89 | 0.88 |
| Identify/evaluate soils for productivity | 3.79 | 0.88 |
| Operate greenhouse facilities | 3.56 | 0.87 |
| Demonstrate safe hunting practices | 3.52 | 0.98 |
| Develop greenhouse production schedules | 3.51 | 0.85 |
| Select/apply pesticides safely | 3.48 | 1.06 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

Data were analyzed to determine administrators' perceptions of skills needed by Agricultural Science teachers in regard to agricultural mechanization. *Safely use hand and power tools* and *metal fabrication equipment* ranked as the two most important skills, respectively. *Agricultural mechanization* skill ratings are presented in Table 2.

Table 2. Summary of Responses to Agricultural Mechanization Skills (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Safely use hand and power tools | 4.75 | 0.51 |
| Use welding/metal fabrication equipment | 4.49 | 0.65 |
| Operate farm machinery/equipment | 3.74 | 1.05 |
| Repair household/farm plumbing systems | 3.72 | 0.82 |
| Maintain farm tractors/machinery | 3.62 | 1.11 |
| Install electrical wiring/fixtures | 3.44 | 0.99 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

When considering youth leadership and development and SEPs, administrators perceived *supervise students on field trips and FFA activities* to be of highest priority followed by *demonstrate the use of parliamentary procedure* as second highest priority. Ratings of the administrators' perceptions of importance to all *youth leadership and SEP* skills can be found in Table 3.

Table 3. Summary of Responses to Youth Leadership Development (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Supervise students on field trips/activities | 4.72 | 0.58 |
| Demonstrate use of parliamentary procedure | 4.36 | 0.86 |
| Complete official FFA record books | 4.33 | 0.85 |
| Apply for FFA proficiency/chapter awards | 4.30 | 0.78 |
| Understand the customs/traditions of FFA | 4.26 | 0.89 |
| Complete Texas FFA Scholarship application | 4.23 | 0.88 |
| Teach public speaking | 4.18 | 0.84 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

Administrators rated *manage the classroom environment* as the most important skill needed by Agricultural Science teachers in the category of instructional management. Following closely to this mean ranked score is *recognize safe and unsafe laboratory practices. Develop lesson plans and recognize different learning styles among students* were tied for third with a mean score of 4.57. *Use cooperative learning techniques* was ranked as the lowest priority. The results can be evaluated in Table 4.

Table 4. Summary of Responses to Instructional Management Skills (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Manage the classroom environment | 4.82 | 0.43 |
| Recognize safe/unsafe laboratory practices | 4.79 | 0.49 |
| Recognize different learning styles | 4.57 | 0.62 |
| Develop lesson plan | 4.57 | 0.72 |
| Use cooperative learning techniques | 4.10 | 0.87 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

Responses to the importance of information technology skills are addressed in Table 5. Administrators perceived *locate sites on the world wide web (WWW)* as the single most important *information technology* skill needed by Agricultural Science teachers. *Create and maintain web pages* were perceived as the lowest priority skill.

Table 5. Summary Responses to Information Technology Skills (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Locate sites on the World Wide Web | 4.31 | 0.81 |
| Use computers to prepare FFA record books | 4.16 | 0.76 |
| Send/receive email and attachments | 4.07 | 0.81 |
| Use PowerPoint or similar software | 3.49 | 0.89 |
| Create and maintain web pages | 3.02 | 1.04 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

Data were analyzed to conclude the order of importance for skills related to serving special populations (Table 6). *Modify instructional techniques for special education students* was perceived as most important. Ranking as lowest priority was *understand the admission-review-dismissal* process. *Work with students who are economically disadvantaged* fell between the highest and lowest priority skill.

Table 6. Summary of Responses to Serving Special Populations (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Modify instruction/special education students | 4.57 | 0.62 |
| Work with economically disadvantaged | 4.44 | 0.67 |
| Understand the A.R. D. process | 4.34 | 0.73 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

In the area of program and professional development, administrators found *communicate with parents and community members* to be the most important skill needed by the Agricultural Science teacher. The least important skill was perceived to be *write applications for educational grants.* These findings are summarized in Table 7.

Table 7. Summary of Responses to Program and Professional Development Skills (n=61).

| Skill | Mean* | SD |
|---|---|---|
| Communicate with parents/community | 4.84 | 0.42 |
| Collaborate with other teachers | 4.62 | 0.64 |
| Interpret school district policies | 4.54 | 0.74 |
| Conduct departmental inventory | 4.44 | 0.67 |
| Develop program budgets | 4.41 | 0.72 |
| Complete business forms (POs, travel, etc.) | 4.36 | 0.90 |
| Manage activity fund accounts | 4.30 | 0.99 |
| Serve as leader among school employees | 4.18 | 0.81 |
| Plan/manage fund raising activities | 4.13 | 0.85 |
| Chair/participate on faculty committees | 3.97 | 0.87 |
| Interpret TAAS/AEIS reports | 3.70 | 0.95 |
| Drive bus for FFA activities | 3.56 | 1.19 |
| Write applications for educational grants | 3.21 | 0.97 |

*Based on a 1-5 Likert- type scale: 1= Unimportant, 5= Essential

## CONCLUSION

Literature reviewed for this study included articles regarding the perceptions and attitudes of administrators, teachers, counselors, and other agricultural educators toward vocational agriculture, the vocational agriculture curriculum, and related programs. The roles and skills deemed important for the secondary Agricultural Science teacher were also addressed.

Flint (1979) suggested that in order to maintain a quality vocational agriculture program community involvement is one of the methods that should be implemented. He stated that this could be achieved by allowing speakers of agriculturally based business or farms in the classroom and using these sites for laboratory instruction. The data from this study supports Flint's findings. When all 49 instructional skills were ranked in descending order of importance, *communicate with parents and community members* ranked as the most important skill needed by Agricultural Science teachers. Respondents also found this as first priority when the skill was categorized in the curriculum area of *program and professional development*. Findings of this study also support those of a previous study by Nowadnick (1979) where being involved in public relations was listed as one of the six rules that should be followed by vocational agriculture programs in order to be successful.

Thompson (1986) studied the goals and objectives of the vocational agriculture program perceived to be important by superintendents, vocational agriculture program perceived to be important by superintendents, vocational agriculture teachers, and students. Among the ten statements listed in the survey was the need to develop competence in livestock and crop judging. Although respondents did not rank livestock judging as an important skill, *select livestock for show projects* ranked in the instructional category of production and natural resources methods as the second highest priority skill.

In a study conducted to compare the perceptions of agricultural teachers and principals on the importance of teachers activities in the vocational program, Cox and Zurbrick (1986) reported leadership development to be the most important instructional area in the future curriculum according to Nebraska teachers, principals, and superintendents. In a second study regarding the perceptions of agricultural education stakeholders toward important curriculum areas in the future, Russell (1999) reported that they also thought leadership to be the most important area in the future. Kotrlick and Drueckhammer (1987) reported that Agricultural Science teachers ranked agricultural mechanics and SEPs as the two most important programmatic factors in order to plan their program for the year 2000. Data from this study did not support findings of Kotrlick and Drueckhammer (1987) regarding agricultural mechanics. However, findings of this study support the points made by Foster et al. (1995) and Russell (1999) since all *youth leadership development and SEP* ranked in the top 25 of the 49 skills.

This study assessed the perception of school administrators toward skills deemed important for the Agricultural Science teacher. The level of importance the administrators placed on these skills was also assessed.

The top ten skills as perceived by school administrators for the Agricultural Science teacher to possess were ranked in descending order of importance and are as follows:

- communicate with parents and community members,
- manage the classroom environment,
- recognize safe and unsafe laboratory practices,
- safely use hand and power tools,

- supervise students on field trips and FFA activities,
- collaborate with other teachers,
- develop lesson plans,
- recognize different learning styles among students,
- modify instruction for students in special education, and
- interpret school districts policies.

Forty-nine skills were divided into seven separate curricular areas including: production and natural resources methods, agricultural mechanization, youth leadership development and SEPs, instructional management, information technology, serving special populations, and program and professional development. Administrators ranked four of the top ten skills in the area of instructional management and three of the top ten skills in program and professional development.

All skills in the curricular area of production and natural resources methods ranked in the bottom 25 of the 49 skills. Of the agricultural mechanization skills, only two ranked in the top 25; these consisted of *safely use hand and power tools* and *use welding/metal fabrication equipment*. All skills in youth leadership development and SEPs were ranked in the top 25 skills as well as all skills in serving populations. All but one instructional management skills were in the top 25.

Administrators perceived most skills in the curricular areas of leadership development and SEPs, serving special populations and instructional management to be of higher importance. Administrators perceived production and natural resources methods skills, agricultural mechanization skills, and information technology skills to be of lower importance by ranking most of those skills in the lower half. Perceptions on program and professional development skills were varied.

These findings can be beneficial to both preservice and inservice Agricultural Science teachers as well as teacher educators. Current and future teachers may use these findings to better understand the rationale that administrators use in making decisions affecting agricultural science programs. Teacher educators may also wish to place greater emphasis on these skills during preservice preparation of Agricultural Science teachers. Even though administrators in this study placed greater emphasis on leadership development than they did on production agriculture and natural resources, information technology, and agricultural mechanization, the latter should not be overlooked in teacher preparation

## REFERENCES

Blezek, A.G. 1986. The prioritization of tasks of vocational agriculture instructors as perceived by state supervisors, teacher educators, and vocational agriculture instructors in Nebraska. *Journal of the American Association of Teacher Educators in Agriculture*, 27 (1): 45-52.

Cox, D. E. & Zurbrick, P. R. 1986. A comparative analysis of perceived importance of teacher activities associated with the program components of vocational agriculture. Journal of the American Association of Teacher Educators in Agriculture, 27 (3): 29-34.

Flint, G.H. 1979. Maintaining quality vo-ag programs-An administrator's view. Agricultural Educational Magazine, 51: 206, 210.

Foster, R., Bell, L., & Erkskine, N. 1995. The importance of selected instructional areas in the present and future secondary agricultural education curriculum as perceived by teachers, principals, and superintendents in Nebraska. Journal of Agricultural Education, 36, (3). 1-7.

Gay, L.R. 1996. Educational research: Competencies for analysis and application. (5th ed.). Englewood Cliffs, NJ: Prentice Hall, Inc.

Kotrlick, J.W. & Drueckhammer, D. 1987. The importance of selected external factors and programmatic components in planning vocational agriculture programs. Journal of the American Association of Teacher Educators in Agriculture, 28 (4): 26-31,49.

Larke, A. & Norris, R.J. 1988. Opinion leadership among teachers of Agricultural science in Texas. Journal of the American Association of Teacher Educators in Agriculture, 29 (4): 32-39.

Miller, W.W., Kahler, A.A. & Rheault, K. 1989. Profile of the effective vocational agricultural. Journal of Agricultural Education, 30 (2): 33-40.

National Council for Agricultural Education. 2001. About agricultural education. [Online]. http://www.teamaged.org/aged/htm.

Nowadnick, G. 1979. A successful vo-ag program-A principal's point of view. Agricultural Education Magazine, 51: 207.

Russell, D.H. 1999. Perception of urban agriculture education stakeholders toward curriculum (urban education, urban agriculture) (Doctoral dissertation, Iowa State University, 1999). Dissertation Abstracts International, 60, 04A.

Stagg, B. & Staller, B. 1999. Will FFA be a part of agricultural education in twenty years? Agricultural Education Magazine, 71: 2,19.

Sworzel, K.A. 1995. A program for the preparation of preservice agricultural education teachers for the twenty-first century. Columbus, OH: Ohio State University, Department of Agricultural Education. (ERIC Document Reproduction Service No. ED 389 676).

Thompson, D.E. 1986. Examining superintendents', vocational agricultural teachers' and vocational agriculture students' perceptions of vocational agriculture programs. Journal of the American Association of Teacher Educators in Agriculture. 27 (4): 37-41.

Vaughn, P.R., Kieth, L., & Lockaby, J. 1999. The FFA organization: Needed then & needed now. Agricultural Education Magazine, 71: 4-5.