Introduction

Agricultural communication curriculums are designed to teach students the skills they need to successfully enter the workforce in the agricultural communication discipline. Skills that students at the collegiate level need to enter the workforce in agricultural communication have been identified by previous research and will remain viable (Cannon & Rhoades, 2016; Hall, Rhoades, & Agunga, 2009; Irlbeck & Akers, 2009; Leal, 2016; Morgan, 2010; Morgan, 2012; Morgan & Rucker, 2013; Rhoades, T. N., Miller, J. D., & Edgar, L. D., 2012; Sitton, 2001; Sitton, S. P., Cartmell, D. D., & Sargent, S., 2005; Sprecker & Rudd, 1997; Sprecker & Rudd, 1998). However, in a world where technology changes, skills for the workforce will also change. "In a world where technology dominates communications, the basics still remain: accuracy, good writing, proper planning, interviewing, verbal skills, and public relations" (Corder & Irlbeck, 2018, p. 190). While the basic skills will remain, additional skills will change depending on the advances of technology.

According to Chesher (2014, p. 46), responsibilities of agricultural communicators in the workforce include "social media, public relations, marketing, management, online content/website development, editing, photography, advertising, writing, graphic design, and video production." These skills have not been analyzed or adapted for use in creating competencies for high school agricultural communication courses.

Agricultural communication is an evolving discipline that changes as technology changes. The discipline began as agricultural journalism, focused on providing rural audiences with information on farming practices, and now encompasses "strategic communications, new and social media, public relations, and marketing, in addition to writing, editing and production of mass media" (Irani & Doerfert, 2013, p. 3). Challenges future agricultural communicators will face are the demand of knowledge of current technologies and the agriculture industry, divison among sectors of agriculture, and connecting with a confused and misinformed public (Kurtzo et al, 2016).

Since this field changes so rapidly, it is important that a frequent evaluation of curriculum be conducted to ensure students are prepared for their careers. Review of curriculum should include those who have experience with the course work (Doerfert & Miller, 2006). Curriculums and competencies for agricultural communication have been studied since the 1980s, but most of these studies examined agricultural communication at the undergraduate or graduate level in post-secondary institutions. (Cannon & Rhoades, 2016; Hall, Rhoades, & Agunga, 2009; Irlbeck & Akers, 2009; Leal, 2016; Leal, et al., 2019; Leal, et al., 2020; Morgan, 2010; Morgan, 2012; Morgan & Rucker, 2013; Rhoades, et al., 2012; Sitton, 2001; Sitton, et al., 2005; Sprecker & Rudd, 1997; Sprecker & Rudd, 1998).

Only a handful of studies have been completed to evaluate what is available for high school level agricultural communication curriculums (Akers, 2000; Calico, 2014; Hanson, 2007; Lawson, 2021; Stockamp, 2010). Secondary agricultural education programs around the nation need relevant information to effectively teach agricultural communication. From 2000 to 2021 the number of states that offered an agricultural communication course at the high school level grew from four to 14 (Lawson, 2021). Akers' (2000) research is the most recent study that has analyzed the competencies needed for high school agricultural communication on a national level, and her study served as a model for this study. Akers' (2000) study was conducted over 20 years ago, and the results have not been updated. Competencies required for higher education and careers in agricultural communication have changed as technology has evolved over the past

20 years (Leal, 2016), and competencies identified as a result of the original study (Akers, 2000) may no longer reflect the needs of secondary agricultural communication programs. Competencies need to be identified, verified, and updated to ensure educational programs are meeting the needs of the future workforce and industry (Finch & Crunkilton, 1989).

Defining agricultural communcations is difficult due to the broad nature of the discipline (Kurtzo et al., 2016). Many skill and knowledge areas needed for success in agricultural communication may also be taught within other secondary education electives, like journalism or video production (Advance CTE, 2008; Polman et al., 2012). However, these industries differ because of the technical knowledge required for careers in agricultural communication (Irani & Doerfert, 2013; Kurtzo et al., 2016).

The future of the agricultural communication discipline depends on the preparation of the next generation of communicators. The findings of this study are in accordance with the American Association for Agricultural Education's national research agenda priority three, Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century (Stripling & Ricketts, 2016). This study aligns with two of the research priority questions identified in this priority area: (1) what competencies are needed for an agricultural and natural resource workforce and (2) what competencies are needed to effectively educate, communicate, and lead?

Purpose and Research Objectives

The purpose of this national study was to provide an up-to-date consensus about the competencies needed for high school students who complete agricultural communication courses. To achieve this purpose, the following research objectives were sought:

RO1: Identify the topics most important to include in high school agricultural communication curriculum.
RO2: Identify the competencies high school students should have upon completion of agricultural communication courses.
RO3: Identify the appropriate scholastic level to introduce the identified competencies to high school students.

Conceptual Framework

The conceptual framework used to organize this study is derived from Finch and Crunkilton's (1989) Curriculum Development in Vocational and Technical Education system for implementing competency-based education. The system for implementing competency-based education has nine main elements:

(1) Identify the life/work domain.
(2) Review available resources.
(3) Identify competencies.
(4) Verify competencies.
(5) Identify competency standards.
(6) Develop objectives and criterion-referenced measures.
(7) Develop instructional activities and materials.

(8) Develop support plans.
(9) Initiate program.

This study focuses on element three, identifying competencies, and element four, verifying competencies. Finch and Crunkilton (1989) described element three as the identification step in competency-based education. In this element, competencies are identified as necessary to include in the educational program (Finch & Crunkilton, 1989). It is essential to identify competencies in "three dimensions: the task dimension, the human dimension, and the environmental dimension" (Finch & Crunkilton, 1989, p. 268). The task dimension is often the most easily identified part of the competency because it is the general statement of what needs to be done. The human dimension focuses on human elements such as attentiveness and personality. The environmental dimension is often the hardest to recognize and can be best obtained from advisory committees and industry professionals (Finch & Crunkilton, 1989).

Element four is the verification step in competency-based education (Finch & Crunkilton, 1989). Once the competency is identified, "it must be verified to ensure that it is indeed critical to success" (Finch & Crunkilton, 1989, p. 268). Competencies can be verified through formal surveys, task analysis, interviews, or an established competency database (Finch & Crunkilton, 1989). There may be overlap between element three and element four when competencies are verified as they are identified.

This study has adapted elements three and four to organize the identification and verification of agricultural communication competencies for secondary education. This adaptation is visualized in the Model for Gathering Consensus for Competencies in Education (see Figure 1). The 93 pre-identified competencies are adapted from Akers' (2000) study, and the new competencies were established in this study. The competencies were verified through the advisory panel of agricultural communication faculty. The scholastic level that is best to introduce each competency to the student was also verified by the advisory panel.

Figure 1

Model for Gathering Consensus for Competencies in Education
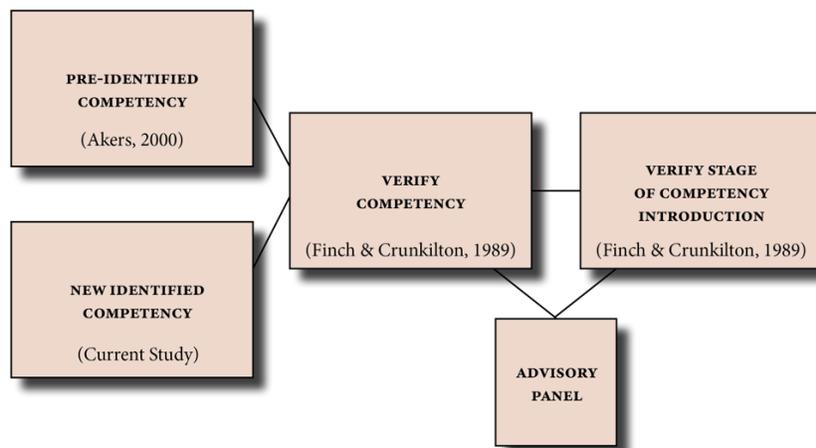
Methodology

A modified Delphi was the primary method used to conduct this study. The Delphi method has been used for research to support various elements of curriculum development and to create standardized curriculums (Linstone & Turoff, 2002; Warner, 2014). Delphi has been used as an alternative to face-to-face group interactions, such as interviews or focus groups, as a means to achieve consensus (Giest, 2002; Linstone & Turoff, 2002). Delphi can be useful because it allows for participant anonymity and equal opportunity for the panelist to be involved in the process, reducing the "band-wagon effect" that can be present in face-to-face interactions (Geist, 2010; Linstone & Turoff, 2002).

According to Martin and Frick (1998), a Delphi involves questionnaires delivered to a group of subject area experts, with specific instructions, on two or more occasions with the objective being consensus. The Delphi process typically begins with the selection of the panel of experts (Akers, 2000; Linstone & Turoff, 2002). The panel should include individuals who are stakeholders in the issue and are qualified to provide input on the issue (Linstone & Turoff, 2002; Warner, 2014). Akers' (2000) used a panel composed of high school agricultural communication teachers, agricultural communication industry leaders, and university faculty in agricultural communication departments.

After the panel is selected, the first iteration of surveys is generative, usually consisting of multiple open-ended questions about the topic, but in some instances the panel can be asked to respond to an existing list of data (Warner, 2014; Linstone & Turoff, 2002; Akers, 2000). For this study, the researcher used the competencies found in Akers' (2000) study instead of generating competencies through an open-ended questionnaire. After the generative round, the researcher analyzes the responses and creates a second questionnaire based on the opinion of the panel (Linstone & Turoff, 2002; Akers, 2000). The second iteration builds off of the first and usually includes a Likert scale to establish agreement (Linstone & Turoff, 2002; Akers, 2000). The iterations continue until the researcher feels that consensus has been achieved (Linstone & Turoff, 2002; Akers, 2000). For this study, two rounds of questionnaires were used to establish agreement among the panelists. The number of rounds that must be completed has not been established, but many researchers agree that two to three rounds are sufficient (Warner, 2014; Linstone & Turoff, 2002; Akers, 2000).

A panel of 10 to 15 panelists is often recommended as the ideal number for a Delphi (Delbecq, Vand De Ven, & Gustafson, D.H., 1975). Delbecq et al. (1975) indicated that an effective panel should feel personally involved in the issue, motivated to complete the Delphi task, and find the information gathered from the study will be useful to them. University faculty meet this qualification and are typically considered experts in their field of study (Ackerman et al., 2009; Barnard-Brak & Lan, 2009). The researchers decided a panel of 10 to 15 agricultural communication university faculty would fit these criteria and be sufficient for this study.

Potential panelists were identified from a member list of the Society of Agricultural Communication Scholars (N=104). Twenty potential panelists were identified from the member list. These potential panelists were chosen based on two criteria: (1) they are faculty in an agricultural communication department, and (2) they are currently teaching courses in agricultural communication. Upon receiving approval from the [University] Institutional Review Board, an initial email was sent to potential panelists requesting their participation. This email was sent from a notable agricultural communication faculty member from the [University] to increase faculty members' participation. While 20 potential panelists were asked to participate,

only 15 responded in the timeframe indicated and agreed to respond to the surveys. Once the faculty members agreed to participate, the first Qualtrics survey was sent to the panel (n=15).

The first iteration of this study included a list of existing competencies found in Akers' (2000) study. The panel was asked to indicate (1) how important they believe each competency is in a high school agricultural communication course and (2) when they feel the competency should first be introduced to the student. The panel was asked to rate each competency using a four-point Likert scale: "No Importance," "Low Importance," "Moderate Importance," and "High Importance." The panel was asked to rate when each competency should be introduced to the student by indicating "High School Freshman," "High School Sophomore," "High School Junior," "High School Senior," or "College" next to each competency. The researchers determined a priori that only those competencies receiving two-thirds level of agreement or higher would be used for inclusion in the curriculum. The percentage of the panel who selected "Moderate Importance" or "High Importance" were used to measure overall agreement. The panel was also asked to list any competencies they felt should be included in a curriculum that were not already listed. This iteration was delivered through Qualtrics by email to each panelist (n=15). The first survey was sent on August 30, 2021, and an email reminder was sent to unfinished panelists on September 10, 2021. Of the 15 panelists, 14 responded, which is a response rate of 93%.

The new responses from the first survey were summarized and condensed based on similarities. Each competency was written on an index card and sorted into stacks based on similarities. Some of the competencies were reworded for clarity and verbs were changed to performance terms so they could be utilized as competencies. Only 16 new competencies were identified by the panel. The list of newly identified competencies was reviewed by two [University] faculty in the department of Agricultural Education and Communication prior to being used for the second survey. The panel was asked to indicate (1) how important they believed each competency was in a high school agricultural communication course and (2) when they feel the competency should first be introduced to the student. The panel was asked to rate each competency using a four-point Likert scale: "No Importance," "Low Importance," "Moderate Importance," and "High Importance." The panel was asked to rate when each competency should be introduced to the student by indicating "High School Freshman," "High School Sophomore," "High School Junior," "High School Senior," or "College" next to each competency. The researchers determined a priori that only those competencies receiving a 66% level of agreement or higher would be used for inclusion in the curriculum. The percentage of the panel who selected "Moderate Importance" or "High Importance" were used to measure overall agreement. This iteration was delivered through Qualtrics by email to each panelist who responded to the first survey (n=14). The second survey was sent on September 22, 2021, and an email reminder was sent to unfinished panelists on September 29, 2021 and October 4, 2021. Of the 14 panelists, 12 responded, which is a response rate of 85%.

Findings

The panel verified the 93 competencies found in Akers' (2000) study and identified 16 new competencies, totaling 109 competencies. Results of the panel's agreement for each competency are illustrated in Table 1. These competencies can be categorized in Akers' (2000) original 11 topic areas: (1) Writing; (2) Computer/Information Technology; (3) Agricultural Industry; (4) Communication History; (5) Professional Development; (6) Research/Information

Gathering; (7) Ethics; (8) Public Relations/ Advertising/ Marketing; (9) Leadership Development; (10) Legislative Issues; and (11) Communication Skills. However, one new topic area was created: (12) Social Media. There were 109 competencies rated by level of importance in a high school agricultural communication curriculum. For the following findings, reaching "agreement" was defined as participants who responded with "Moderate Importance" and "High Importance" for a particular competency.

One hundred percent of the panel agreed that 24 of the competencies should be included in a high school agricultural communication curriculum. Competencies receiving 100% agreement were "Utilize correct grammar," "Utilize correct spelling," "Utilize correct punctuation," "Accurately proofread a document," "Identify current issues and concerns in the agricultural industry," "List qualities of an effective communicator," "Demonstrate listening skills," "Work in a team activity," "Work under pressure," "Research both sides of an issue," "Check facts," "Identify biased information," "Use e-mail properly," "Perform basic word processing," "Identify the importance of correctly reporting the facts," "Demonstrate different methods of communication," "Define media literacy, basic elements and techniques," "Develop content for social media," "Demonstrate critical thinking skills," "Identify ethical behavior in journalism," "Evaluate communication efforts," "Write a news article," "Demonstrate the ability to be an effective spokesperson for agriculture," and "Identify bias in media stories."

There were 19 competencies that recievd a 90 to 99% level of agreement, six competencies received an 80 to 89% level of agreement, and 17 competencies received a 70 to 79% agreement. The rest of the competencies did not meet the two-thirds (66.66%) level of agreement. The full list each competency and the panel's level of agreement are illustrated in Table 1.

Table 1

Agreement levels of each competency by panel

Competency	Topic Area	Agreement*
Utilize correct grammar	Writing	**100.00%**
Utilize correct spelling	Writing	**100.00%**
Utilize correct punctuation	Writing	**100.00%**
Accurately proofread a document	Writing	**100.00%**
Identify current issues and concerns in the agricultural industry	Agriculture Industry	**100.00%**
List qualities of an effective communicator	Communication History	**100.00%**
Demonstrate listening skills	Professional Development	**100.00%**
Work in a team activity	Professional Development	**100.00%**

Competency	Topic Area	Agreement
Work under pressure	Professional Development	**100.00%**
Research both sides of an issue	Research/Information Gathering	**100.00%**
Check facts	Research/Information Gathering	**100.00%**
Identify biased information	Research/Information Gathering	**100.00%**
Identify sources for information	Research/Information Gathering	**100.00%**
Use e-mail properly	Computer/Information Technology	**100.00%**
Perform basic word processing	Computer/Information Technology	**100.00%**
Identify the importance of correctly reporting the facts	Ethics	**100.00%**
Demonstrate different methods of communication	Communication History	**100.00%**
Define media literacy, basic elements and techniques	Communication History	**100.00%**
Develop content for social media	Social Media	**100.00%**
Demonstrate critical thinking skills	Leadership Development	**100.00%**
Identify ethical behavior in journalism	Ethics	**100.00%**
Evaluate communication efforts	Communication Skills	**100.00%**
Write a news article	Writing	**100.00%**
Demonstrate the ability to be an effective spokesperson for agriculture	Leadership Development	**100.00%**
Identify bias in media stories	Ethics	**100.00%**
Write a speech	Writing	**92.86%**

Competency	Topic Area	Agreement
Write for the web	Writing	**92.86%**
Speak intelligently before a group	Legislative Issues	**92.86%**
Identify barriers to effective communication	Communication History	**92.86%**
Effectively interview a person	Writing	**92.86%**
Demonstrate a proper work ethic	Professional Development	**92.86%**
Seek, gather and synthesize information	Research/Information Gathering	**92.86%**
Utilize desktop publishing techniques	Computer/Information Technology	**92.86%**
Develop a multimedia presentation	Computer/Information Technology	**92.86%**
Distinguish between right and wrong	Ethics	**92.86%**
Demonstrate professional/business etiquette	Professional Development	**92.86%**
Give an effective interview	Leadership Development	**92.86%**
Identify different audiences	PR/ Advertising/ Marketing	**92.86%**
Effectively utilize the internet	Computer/Information Technology	**92.86%**
Demonstrate the ability to cite sources correctly	Research/Information Gathering	**92.86%**
Utilize social media for public relations	Social Media	**90.91%**
Develop a social media schedule	Social Media	**90.91%**
Conduct audience analysis	Communication Skills	**90.91%**
Utilize basic graphic design principles	Computer/Information Technology	**90.91%**

Competency	Topic Area	Agreement
Demonstrate an understanding of copyright law	Legislative Issues	**90.91%**
Deliver a formal, oral presentation using clear enunciation, gestures, tone & vocabulary	Leadership Development	**85.72%**
Identify what makes a topic newsworthy	Writing	**85.72%**
Effectively edit a story	Writing	**85.72%**
Identify the various career opportunities in agricultural communication	Professional Development	**85.72%**
Create a resume	Writing	**85.72%**
Identify strategies to improve communication	Communication History	**85.72%**
Write a professional letter	Writing	**78.57%**
Write a caption for photos	Writing	**78.57%**
Utilize appropriate agricultural terminology	Agriculture Industry	**78.57%**
Discuss the role of public relations in agricultural companies	PR/Advertising/ Marketing	**78.57%**
Utilize graphic design programs	Computer/Information Technology	**78.57%**
Demonstrate proper phone skills	Professional Development	**78.57%**
Utilize an Associated Press stylebook	Writing	**78.57%**
Target different audiences	PR/ Advertising/ Marketing	**78.57%**
Discuss the techniques and principles involved in public speaking	Leadership Development	**76.92%**
Converse knowledgeably on the different areas in agriculture	Agriculture Industry	**76.92%**
Discuss legal concerns about social media	Legislative Issues	**72.73%**
Write a script for video	Writing	**72.73%**
Write for blogs	Writing	**72.73%**

Competency	Topic Area	Agreement
Utilize the basic principles involved in technical writing	Writing	**71.43%**
Write a quality thank-you note	Writing	**71.43%**
Discuss the role of public relations in farm organizations	PR/Advertising/ Marketing	**71.43%**
Describe the communication model	Communication History	**71.43%**
Identify the components and format of news releases	Writing	64.29%
Write a feature story	Writing	64.29%
Determine whether a topic would be best covered in a news article or feature article	Writing	64.29%
Identify the key elements of a public relations campaign	PR/Advertising/ Marketing	64.29%
Identify the importance of an advertising campaign	PR/Advertising/ Marketing	64.29%
Identify various professional communication organizations	Professional Development	64.29%
Utilize a nonlinear video-editing program	Computer/Information Technology	64.29%
Effectively scan a document	Writing	64.29%
Describe the history of agricultural communication	Communication History	64.29%
Identify the basics of corporate communication	PR/Advertising/ Marketing	64.29%
Interview for employment	Professional Development	64.29%
Identify the basic workings of the government system and how it affects the agricultural industry	Legislative Issues	64.29%
Utilize crisis communication	Communication Skills	60.00%
Write a news release	Writing	57.15%

Competency	Topic Area	Agreement
Discuss the role of public relations in advertising agencies	PR/ Advertising/ Marketing	57.15%
Discuss the Freedom of Information Act	Legislative Issues	57.14%
Properly use a digital camera	Communication Skills	57.14%
Interpret statistics	Research/Information Gathering	57.14%
Analyze social media data	Social Media	54.54%
Discuss lobbying and advocating for the agricultural industry	Legislative Issues	54.54%
Write for a broadcast	Writing	50.00%
Discuss the importance of belonging to professional organizations	Professional Development	50.00%
Create and design a webpage	Computer/Information Technology	46.15%
Prepare a public relations campaign	PR/Advertising/ Marketing	42.86%
Discuss libel law	Legislative Issues	42.86%
Identify appropriate file formats when using scanning programs	Computer/Information Technology	42.85%
Properly use a video camera	Communication Skills	42.85%
Prepare a 4-6-minute speech within a 30-minute preparation time	Leadership Development	38.46%
Write a letter of complaint	Writing	36.36%
List the benefits of attending professional organization meetings	Professional Development	35.71%
Properly use a 35 mm camera	Communication Skills	35.71%
Deliver a radio broadcast	Communication Skills	35.71%
Identify the steps in the printing/developing process	Communication Skills	23.08%

Competency	Topic Area	Agreement
Demonstrate sales skills	PR/Advertising/ Marketing	21.43%
Analyze and apply technical data & procedures found in service manuals	Research/Information Gathering	21.43%
Utilize correct parliamentary procedure	Leadership Development	21.43%
Apply common sense logic to an economic trend analysis	PR/Advertising/ Marketing	14.29%
Deliver a TV broadcast	Communication Skills	14.28%
Interpret the basics of the commodities market	PR/Advertising/ Marketing	7.14%

* Boldface in the "Agreement" column indicates the competencies that are above the two-thirds (66.66%) threshold of agreement among research participants.

The panel agreed that nine of the *writing* competencies should be taught at the freshman level: "Utilize correct grammar," "Utilize correct spelling," "Utilize correct punctuation," "Accurately proofread a document," "Write a professional letter," "Utilize the basic principles involved in technical writing," "Write a quality thank-you note," and "Write a news article." The panel was evenly divided in their agreement that the writing competency "Effectively scan a document" should be introduced at the freshman or sophomore level. The panel agreed that seven additional writing competencies should be taught at the sophomore level: "Write a speech," "Identify what makes a topic newsworthy," "Create a resume," "Identify the components and format of news releases," and "Write a letter of complaint." The panel was evenly divided in their agreement that two writing competencies – "Write for blogs" and "Write a news release" – should be introduced at the sophomore or junior level. The panel agreed that seven additional writing competencies should be taught at the junior level. These competencies were "Write for the web," "Effectively interview a person," "Effectively edit a story," "Write a caption for photos," "Write a feature story," "Determine whether a topic would be best covered in a news article or feature article," and "Write a script for video." The panel was evenly divided in their agreement that the writing competency "Utilize an Associated Press stylebook" should be introduced at the sophomore, junior, senior, or college levels.

The panel agreed that three of the *computer/information technology* competencies should be taught at the freshman level: "Use email properly," "Perform basic word processing," and "Effectively utilize the internet." The panel agreed that two of the computer/information technology competencies should be taught at the sophomore level. These competencies were "Develop a multimedia presentation" and "Create and design a webpage." The panel was evenly divided in their agreement that the computer/information technology competency "Utilize graphic design programs" should be introduced at the sophomore or senior level. The panel

agreed that one of the computer/information technology competencies should be taught at the junior level: "Utilize desktop publishing technique." The panel was evenly divided in their agreement that the computer/information technology competency "Create and design a webpage" should be introduced at the junior or senior level. The panel agreed that one additional computer/information technology competency should be taught at the senior level: "Utilize a nonlinear video-editing program."

The panel agreed that one *agricultural industry* competency should be taught at the freshman level, "Utilize appropriate agricultural terminology," and two agricultural industry competencies should be taught at the sophomore level: "Identify current issues and concerns in the agricultural industry" and "Converse knowledgeably on the different areas in agriculture."

The panel agreed that one *communication history* competency should be taught at the freshman level: "List qualities of an effective communicator." The panel was evenly divided in their agreement that the communication history competency "Define media literacy, basic elements and techniques" should be introduced at the freshman or senior level. The panel was evenly divided in their agreement that two communication history competencies, "Identify strategies to improve communication" and "Describe the communication model," should be introduced at the freshman or sophomore level. The panel agreed that two additional communication history competencies should be introduced at the sophomore level: "Demonstrate different methods of communication" and "Describe the history of agricultural communication."

The panel agreed that five *professional development* competencies should be taught at the freshman level: "Demonstrate listening skills," "Work in a team activity," "Demonstrate a proper work ethic," "Demonstrate professional/business etiquette" and "Demonstrate proper phone skills." The panel agreed that two professional development competencies should be taught at the sophomore level: "Identify the various career opportunities in agricultural communication" and "Interview for employment." The panel agreed that one professional development competency should be introduced at the junior level, "Work under pressure," and three at the college level, "Identify various professional communication organizations," "Discuss the importance of belonging to professional organizations," and "List the benefits of attending professional organization meetings."

The panel agreed that three *research and information gathering* competencies should be taught at the freshman level: "Research both sides of an issue," "Demonstrate the ability to cite sources correctly," and "Check facts." The panel was evenly divided in their agreement that two research and information gathering competencies, "Identify biased information" and "Identify sources for information," should be introduced at the freshman or sophomore level. The panel agreed that one additional research and information gathering competency should be introduced at the sophomore level: "Seek, gather and synthesize information." The panel agreed that only one research and information gathering competency should be taught at the college level: "Analyze and apply technical data and procedures found in service manuals."

The panel agreed that three *ethics* competencies should be introduced at the freshman level: "Identify the importance of correctly reporting the facts," "Distinguish between right and wrong," and "Identify ethical behavior in journalism." The panel agreed that "Identify bias in media stories" should be introduced at the sophomore level.

The panel agreed that one *public relations/ advertising/ marketing* competency should be introduced at the freshman level, "Identify different audiences," and one competency should be introduced at the sophomore level, "Target different audiences." The panel agreed that five public relations/ advertising/ marketing competencies should be taught at the junior level:

"Identify the key elements of a public relations campaign," "Identify the importance of an advertising campaign," "Discuss the role of public relations in advertising agencies," "Prepare a public relations campaign," and "Demonstrate sales skills." The panel was evenly divided in their agreement that two public relations/ advertising/ marketing competencies, "Discuss the role of public relations in agricultural companies" and "Discuss the role of public relations in farm organizations," should be introduced at the junior or senior level. The panel agreed that one public relations/ advertising/ marketing competency should be taught at the college level: "Apply common sense logic to an economic trend analysis." The panel was evenly divided in their agreement that the public relations/ advertising/ marketing competency, "Interpret the basics of the commodities market" should be introduced at the senior or college level.

The panel agreed that four *leadership development* competencies should be taught at the freshman level: "Deliver a formal, oral presentation using clear enunciation, gestures, tone, and vocabulary," "Discuss the techniques and principles involved in public speaking," "Utilize correct parliamentary procedure," and "Demonstrate critical thinking skills." The panel agreed that two leadership development competencies should be taught at the sophomore level, "Give an effective interview" and "Demonstrate the ability to be an effective spokesperson for agriculture," and one leadership development competency should be introduced at the senior level, "Prepare a 4-6-minute speech within a 30-minute preparation time."

The panel agreed that two *legislative issues* competency, "Speak intelligently before a group" and "Discuss legal concerns about social media," should be introduced at the sophomore level. The panel agreed that the legislative issues competencies "Identify the basic workings of the government system and how it affects the agricultural industry" and "Identify current legislative bills that affect agriculture" should be introduced at the junior level. The panel agreed that the legislative issues competencies "Discuss the Freedom of Information Act" and "Discuss how current bills will affect agriculture" should be introduced at the senior level. The panel was evenly divided in their agreement that the legislative issues competency "Demonstrate an understanding of copyright law" should be introduced at the freshman or junior level. The panel was also evenly divided in their agreement that the competency "Discuss lobbying and advocating for the agricultural industry" should be introduced at the freshman or senior level. The panel was also evenly divided in their agreement that the competency "Discuss libel law" should be introduced at the junior, senior, or college level.

The panel agreed that one *communication skills* competency, "Properly use a digital camera," should be introduced at the junior level. The panel was also evenly divided in their agreement that two competencies, "Deliver a radio broadcast" and "Identify the steps in the printing/developing process" should be introduced at the junior or senior level. The panel agreed that four additional communication skills competencies should be taught at the senior level: "Properly use a video camera," "Evaluate communication efforts," "Conduct audience analysis," and "Utilize crisis communication." The panel was also evenly divided in their agreement that one competency, "Deliver a TV broadcast" should be introduced at the senior or college level. The panel was also evenly divided in their agreement that the competency "Properly use a 35 mm camera" should be introduced at the freshman, sophomore, junior, senior, or college level.

The panel agreed that one *social media* competency, "Develop content for social media," should be introduced at the sophomore level. The panel agreed that the rest of the social media competencies should be taught at the junior level: "Utilize social media for public relations," "Develop a social media schedule," and "Analyze social media data."

Conclusions

Data was sorted by percentage of agreement from the participants. The topics identified in this study included the 11 topic areas previously identified in Akers' (2000) study and an additional topic area: social media. The topic areas that are most important to include in a high school agricultural communication curriculum are:

- Writing
- Computer/Information Technology
- Agricultural Industry
- Communication History
- Professional Development
- Research/Information Gathering
- Ethics
- Public Relations/Advertising/Marketing
- Leadership Development
- Legislative Issues
- Communication Skills
- Social Media

The panel identified 68 of the competencies as moderately to highly important to include in a high school agricultural communications course. Thirty-seven competencies from Akers' (2000) study and four newly identified competencies did not reach the two-thirds level of agreement by the panel; high school agricultural communication curriculum designers should scrutinize these competencies closely, based on their needs, to determine whether to include these competencies in high school agricultural communication curriculum.

Recommendations

Based on the competencies identified as moderate and high importance by the panel and their agreement of when to introduce the competency to students, the researchers recommend that an introductory and advanced agricultural communication curriculum should be developed for high school students.

An introductory agricultural communication course should include the following topic areas and competencies and be utilized for high school freshman and sophomores:

Writing: utilize correct grammar, utilize correct grammar, utilize correct punctuation, accurately proofread a document, write a professional letter, utilize the basic principles involved in technical writing, write a quality thank-you note, write a news article, write a speech, identify what makes a topic newsworthy, and create a resume.

Computer/Information Technology: use email properly, perform basic word processing, effectively utilize the internet, and develop a multimedia presentation.

Agricultural Industry: utilize appropriate agricultural terminology, identify current issues and concerns in the agricultural industry, and converse knowledgeably on the different areas in agriculture.

Communication History: list qualities of an effective communicator, define media literacy, basic elements and techniques, identify strategies to improve communication, describe the communication model, and demonstrate different methods of communication.

Professional Development: demonstrate listening skills, work in a team activity, demonstrate a proper work ethic, demonstrate professional/business etiquette, and demonstrate proper phone skills.

Public Relations/Advertising/Marketing: identify different audiences and target different audiences

Research and Information Gathering: research both sides of an issue, check facts, identify biased information, demonstrate the ability to cite sources correctly, and identify sources for information.

Ethics: identify the importance of correctly reporting the facts, distinguish between right and wrong, identify bias in media stories, and identify ethical behavior in journalism.

Leadership Development: deliver a formal oral presentation using clear enunciation, gestures, tone and vocabulary, discuss the techniques and principles involved in public speaking, demonstrate the ability to be an effective spokesperson for agriculture, and demonstrate critical thinking skills and give an effective interview

Legislative Issues: speak intelligently before a group and discuss legal concerns about social media.

Communication Skills: evaluate communication efforts and conduct audience analysis.

Social Media: develop content for social media.

An advanced agricultural communication course should include the following topic areas and competencies and be utilized for high school juniors and seniors:

Writing: write for the web, effectively interview a person, effectively edit a story, write a caption for photos, utilize an associated press stylebook and write a script for video.

Computer/Information Technology: utilize desktop publishing technique

Professional Development: work under pressure.

Public Relations/Advertising Marketing: discuss the role of public relations in agricultural companies and discuss the role of public relations in farm organizations.

Legislative Issues: demonstrate an understanding of copyright law.

Social Media: utilize social media for public relations and develop a social media schedule.

The researchers also recommend that the curriculum that is developed should be pilot-tested to determine if it needs any changes. Due to the foundational nature of this study, the researchers recommend further investigation to see if the competencies found in this study can be shared by other electives, such as in high school journalism courses, to lessen the burden on the agricultural education teacher. The researchers also recommend the possible overlap between agricultural communication competencies and competencies in other elective courses as a possible area for future research (Advance CTE, 2008; Polman et al., 2012). This study should be updated in an appropriate amount of time to accommodate for the changing technology in the agricultural communication discipline (Akers, 2000; Calico, 2014; Hanson, 2007; Lawson, 2021; Stockamp, 2010). In addition, the researchers recommend that research should be conducted to evaluate secondary agricultural communication teachers' skills and ability to integrate these competencies in a curriculum (Calico, 2014; Lawson, 2021). When this study is updated, the researchers suggest that if a Delphi technique is used, the first round should be generative. An additional study should be completed with agricultural communication industry professionals to

gain another perspective on the competencies needed in high school agricultural communication. The list of competencies should be disseminated to agricultural education programs in the United States for use in curriculum building.

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