CONTENT ANALYSIS OF A CLOSED FACEBOOK GROUP
FOR SCHOOL-BASED AGRICULTURAL EDUCATION
TEACHERS IN CALIFORNIA

By

KATHRYN LOUISE TEIXEIRA

Bachelor of Science in Agricultural Science
California Polytechnic State University
San Luis Obispo, CA
2009

Master of Science in Agriculture
California Polytechnic State University
San Luis Obispo, CA
2014

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Dissertation Approved:

Robert Terry Jr.
Dissertation Adviser

Ruth B. Inman
Dissertation Co-Adviser

J. Shane Robinson

Ki Lynn Cole

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"… if you have faith as small as a mustard seed, you can say to this mountain, 'Move from here to there,' and it will move. Nothing will be impossible for you." *Matthew 17:20*

It is hard to believe almost eight years ago the seed was planted to begin this journey. I could never have imagined the trials and triumphs within the past eight years, and even more so the final weeks of this journey. Thankfully, my faith has led me through it all, and my family has remained steadfast and supported the giant leap of faith to return to school and pursue this dream.

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Since it began in April of 2004, Facebook has been used as a means to connect people around the world. In 2010, the platform introduced the Groups feature to allow members to communicate about shared interests (Facebook, 2020). Included in the multitude of groups around the world are a new wave of communication for school-based agricultural education teachers. In 2015, the Ag Education Discussion Lab at the national level, and later in 2016 the California Ag Ed Discussion Lab for SBAE teachers in California. A dearth of literature exists about the use of closed Facebook groups for teachers, especially in agricultural education. The purpose of this study was to classify and analyze posts in a closed Facebook group for school-based agricultural education teachers in California. This study employed quantitative content analysis to identify what teachers were posting about in the CAEDL Facebook group by SBAE teacher role and how they communicated the information via communicative functions of social media. Data were collected covering a three-year span of time of the group. The study analyzed the number of posts, comments, and reactions during the timeframe of the study as well as the authorship of the posts. The number of posts increased significantly from 2017 to 2018 and also increased in concert with membership growth in the group. The content of the posts was coded to identify the subject of the post. Findings indicated a small group of members in the CAEDL accounted for most of the posts during the time frame of the study and the SBAE teacher roles of Instruction and FFA were the most posted subjects. Using the conceptual framework developed for this study, data revealed 53.9% of posts were found in one of three categories; mobilization/instruction, information sharing/instruction, and mobilization/FFA. Furthermore, the content of posts coincided with events happening within the profession.

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CHAPTER I

INTRODUCTION

The structure of school-based agricultural education (SBAE) consists of three main components, diagramed in the iconic three-component, or three-circle, model of agricultural education shown in Figure 1 (National FFA Organization, n.d.). Croom (2008) stated, "For the model to be successful to a significant degree, there must be a commitment by all stakeholders to deliver all components collectively to those students who can be served by it" (p. 118). The integrated model shows the relationship between the three parts of agricultural education, stressing the overlap of each, and requires agricultural education programs to provide instruction, supervised agricultural experience (SAE), and FFA (Talbert et al., 2006).

At the nexus of these three circles is an educator trained to teach agriculture in the classroom and perform the multitude of responsibilities necessary for a complete program. Although each of the circles is important to a successful agricultural education program, they only qualify as part of the duties of a SBAE instructor (Delnero & Montgomery, 2001; Roberts & Dyer, 2004; Talbert et al., 1994; Terry & Briers, 2010). There are responsibilities of an agricultural educator beyond those depicted by these three circles (Delnero & Montgomery, 2001; Talbert et al., 1994, 2007; Terry & Briers, 2010).

Figure 1

The Three-Circle Model of Agricultural Education
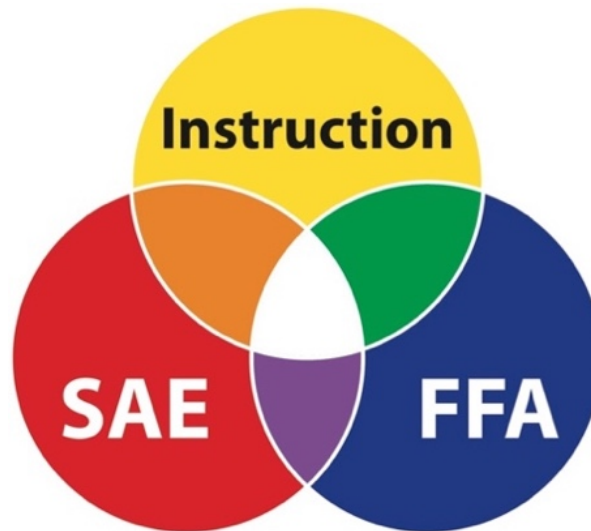
Adapted from *Agricultural Education,* n.d. (https://www.ffa.org/agricultural-education/)

The agricultural education profession is a demanding vocation because it requires insight into a variety of different agricultural content areas and a substantial commitment of time and resources outside of normal school hours and the normal classroom (Croom, 2003; Delnero & Montgomery, 2001; Rayfield et al., 2014; Talbert et al., 2007). Even though SBAE education teachers can enter the profession from varying educational backgrounds, their roles and responsibilities remain largely the same (Roberts & Dyer, 2004; Talbert et al., 2007). Thus, the profession recognizes the need to offer professional development to supplement the background knowledge of teachers gained through traditional and alternative certification programs (Roberts & Dyer, 2004; Stair et al., 2019). Further, the consistent advancements in the field of agriculture require teachers to current on technologies and advancements within the industry, to provide quality instruction for their students (Davis & Jayarante, 2015; Talbert et al., 2007).

The need for professional development for teachers within the various contexts is discussed in the literature, including perceived in-service needs of beginning teachers and also by teacher career phase (Birkenholz & Harbstreit, 1987; Duncan et al., 2006; Figland et al., 2019; Garton & Chung, 1996; Golden et al., 2014; Layfield & Dobbins, 2002; Roberts & Dyer, 2004; S. W. Smalley & Smith, 2017; A. R. Smith & Smalley, 2018; Stair et al., 2019). Identifying the in-service needs of SBAE teachers varies by career phase, and also covers a multitude of teacher competencies and skills thought to be necessary for the profession (DeLay & Washburn, 2013; Layfield & Dobbins, 2002; S. W. Smalley & Smith, 2017; A. R. Smith & Smalley, 2018)

Talbert et al. (2007) expressed "A beginning agriculture teacher should feel comfortable in seeking out experienced teachers as informal mentors" (p. 34). The ability for teachers to collaborate connects teachers based on professional interests, but more importantly, being connected to other SBAE teachers can reduce teacher burnout (Boone & Boone, 2007b; DeLay & Washburn, 2013; Kelly & Antonio, 2016). However, Traini et al. (2019) identified illusionary support as a hindrance to success for agriculture teachers, including critically looking at the communities of practice and systems of support in the profession. Participants in their study agreed "few resources exist to help them on the journey toward work-life balance" (p. 248).

As the agricultural education career continues to evolve, teachers are utilizing different means to reach other members of the profession. At the national level, the *Ag Education Discussion Lab* Facebook group was created in August 2015 to provide a forum for discussion of agricultural education topics, "especially providing resources and *mentors* [emphasis added] to beginning teachers" (Ag Education Discussion Lab

Facebook, 2020, para. 1). The *Ag Education Discussion Lab* Facebook group created a community of agricultural education teachers throughout the country that grew in popularity. The utilization of media to create this community of people is an example of Media Ecology, where the technology (i.e. social media) recreates the way society communicates and creates a symbiotic relationship in a given community, or *ecosystem* (Strate, 2004; R. L. West & Turner, 2018; Zhao et al., 2016).

Following the implementation of the *Ag Education Discussion Lab* Facebook group at the national level, California SBAE teachers detected a need for a new ecosystem of their own to meet their own unique needs (personal communication, Nicole Ray, September 11, 2019). On June 6, 2016, the *California Ag Ed Discussion Lab* was created as a discussion board for the unique curriculum and activities that occur in California (personal communication, Nicole Ray, September 11, 2019). The purpose of the group was to:

> Share resources, collaborate and connect with those in California. With the addition of the new NGSS standards and so many schools adopting the new science courses this group can be a resource to help teachers navigate challenges, seek advice, share successes, and share resources. (California Ag Ed Discussion Lab, n.d., para. 1)

According to Nicole Ray (personal communication, April 18, 2020), the group gained popularity and started getting a lot of requests from people outside of California. Ray asked group members what they thought about adding people from other states and the group consensus was the national *Ag Ed Discussion Lab* met that need. Ray stated members wanted to keep topics focused on California SBAE teachers' needs/issues. She

changed the name of the group to *California Ag Education Discussion Lab (CATA members only)* (CAEDL) on July 5, 2017, to retain the focus for California SBAE teachers and match the groups' wishes. Ray stated potential members are asked to respond to questions to allow administrators to filter members and limit the group to SBAE teachers and stakeholders in agricultural education in California. As a private group, only members can see who other members are and interact with the group through creating and responding to posts. Utilization of this online forum provides opportunities for members to ask for advice and share new and interesting teaching resources for others to use in the profession (personal communication, Nicole Ray, September 11, 2019).

Statement of the Problem

A review of the literature yielded little to no research analyzing posts in closed Facebook groups for SBAE teachers. Analysis of the CAEDL Facebook group by describing the conversations and interactions of members is needed to better understand how teachers are using such forums and how they may contribute to challenges and opportunities associated with the profession.

Purpose

The purpose of this study was to analyze posts in the CAEDL Facebook group to classify and further analyze conversations of California SBAE teachers to understand the use of the group by members.

Objectives

The following objectives framed this study:

1. Describe the selected characteristics (age and gender) of members of the CAEDL Facebook group.

2. Describe members' use of the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

3. Describe engagement per post (comments, reactions, and shares) of the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

4. Classify the communicative functions of posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

5. Classify the SBAE teacher roles identified in CAEDL Facebook group posts from January 1, 2017, to December 31, 2019.

6. Examine relationships among frequencies of posts in each of the identified SBAE teacher roles across communicative functions in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

7. Identify conversations within each SBAE Teacher role using content subcategories of posts classified in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

8. Describe authorship of posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

Scope of the Study

This study examined the Facebook posts from the CAEDL Facebook group from January 1, 2017, to December 31, 2019. Post content data were collected on January 10, 2020.

Significance of the Study

The SBAE profession has a need for mentorship and community for its teachers. The lack of mentorship and the illusion of support within the SBAE profession has pushed teachers to adopt unrealistic expectations (Traini et al., 2019). Although young teachers reach out and can be mentored by those closest to them geographically, the need exists for *expert* help for new teachers in the form of informal mentorship and/or professional development (DeLay & Washburn, 2013; Ingersoll & Smith, 2003; Traini et al., 2019). Being part of an external network of teachers, especially those within the same field of study, helps reduce teacher turnover (Ingersoll & Smith, 2004; T. M. Smith & Ingersoll, 2004). Teachers are using the national Ag Education Discussion Lab and California Ag Ed Discussion Lab, but the conversations of teachers including posts, comments, and reactions, have not been analyzed. Furthermore, with little to no research analyzing the content of *any* closed Facebook groups, the results of this study provide a foundation for future studies of closed Facebook groups and more specifically those for SBAE teachers.

Assumptions

The following assumptions were made for the purpose of the study:

1. Members of the CAEDL are school-based agricultural educators in California.

2. All posts analyzed in the study were authored by SBAE teachers in California.

3. All posts were intended for an audience of SBAE teachers in California.

4. All group members are truthful about the content they post on the CAEDL Facebook group.

Limitations of the Study

The following limitations to this study are acknowledged:

1. The data for the study do not account for members who joined and left the group during the three-year span; rather, it only accounts for the join date of members current as of January 10, 2020.

2. Information about posts downloaded on January 10, 2020, only included information still available at that time on the CAEDL Facebook group page. Any content previously posted and deleted could not be included in the study.

3. The CAEDL is a closed Facebook group designed for California SBAE teachers to discuss topics related to their profession. This study was a census of the members of the CAEDL Facebook group and is not a direct representation of the population of California SBAE teachers.

Definitions of Terms

Authorship – For the purpose of this study, authorship is defined as the writing of posts in

the CAEDL Facebook group

Beginning teachers – See career stages of agricultural educators

Career stages of agricultural educators –Defined by year of service

Pre-service teachers – Students enrolled in teacher education programs at the

university level, includes undergraduate students, student teachers, and any

other students who have not yet entered the profession.

Beginning teachers – Also referred to as early-career teachers, beginning teachers

are in the first to fifth year teaching.

Mid-career teachers – Teachers in years 6–15 of teaching.

Late-career teachers – Teachers who have been teaching in excess of 15 years.

Communicative function – The intent or purpose of a social media post.

Closed Facebook group – A Facebook group that restricts membership to individuals

approved by administrators of the group.

Engagement –Users commenting, reacting or sharing Facebook posts within the group's

Facebook page

Facebook – Social media platform launched in 2004

Facebook group – Online gathering place for people with common interests to

communicate and share their interests and express opinions.

Facebook post – Referred to in this study as a *post*, a Facebook post is a message created

by a Facebook user and posted on the group Facebook wall.

Facebook wall – The area on a group's page where members can post thoughts, views, or
criticisms for other group members to see.

Founding member – Members of the CAEDL Facebook group who joined in the first
month of the group

In-service teachers – Currently in the teaching profession

In-service needs – Professional development needs of teachers in the profession

Lurkers – consumers of Facebook content who do not contribute to the group through
posting or interacting with other members

Mid-career teacher – See career stages of agricultural educators

Pre-service teachers – See career stages of agricultural educators

School-based agricultural education (SBAE) – Teaches students about agriculture, food,
and natural resources; known for having three components (Instruction, SAE, and
FFA).

Teacher certification – SBAE teachers can be either traditionally certified or alternatively
certified. Traditionally certified teachers complete a teacher education program at
a university. Alternatively, certified teachers enter the profession by taking a
teacher certification test.

Figure 2

Screenshot of the CAEDL *Facebook Group Page.*
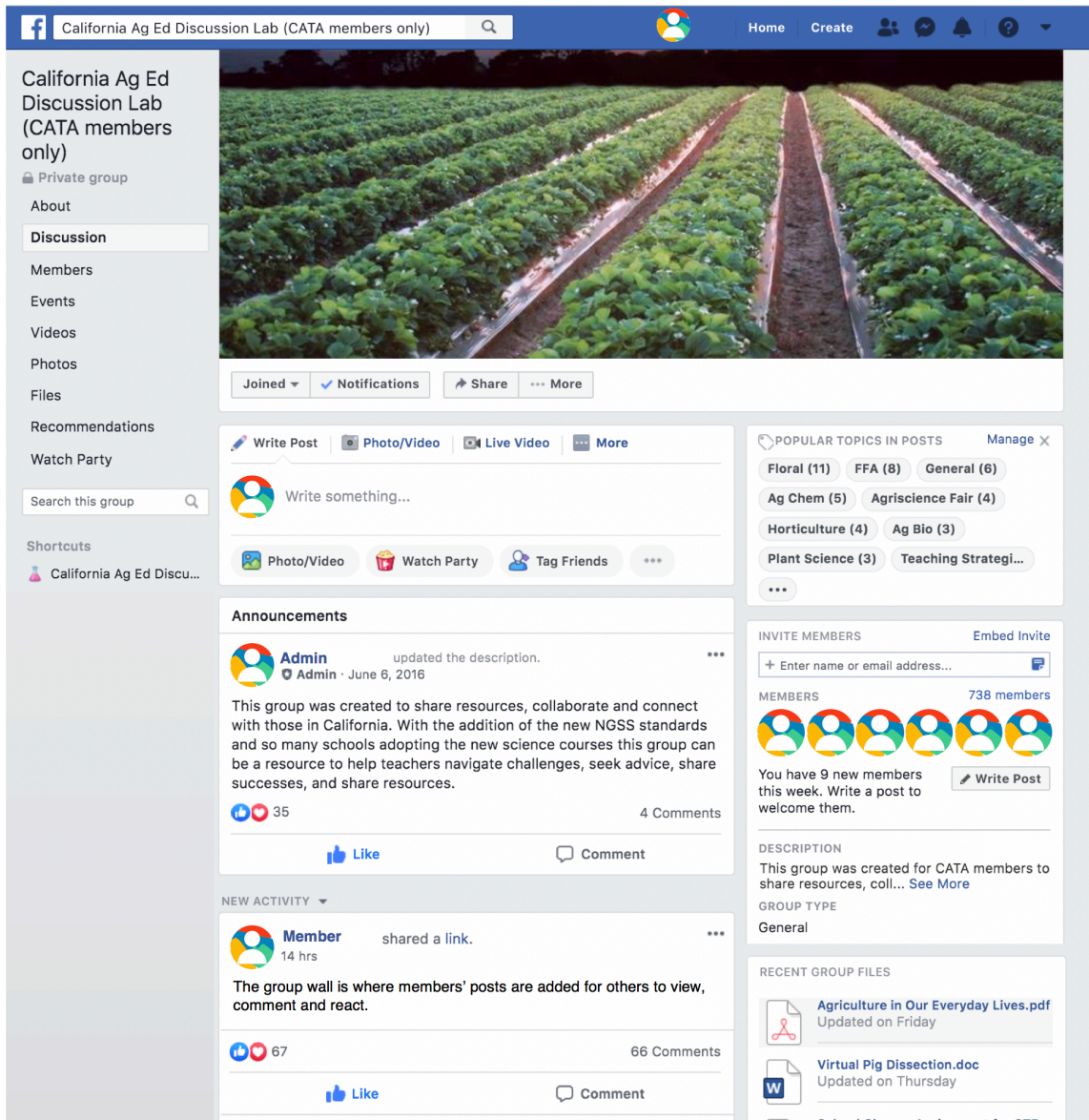
CHAPTER II

REVIEW OF LITERATURE

Chapter II is a review of literature organized into eight sections: History of school-based agricultural education; Roles of SBAE teachers; Professional development needs in agricultural education; Collaboration; Mentorship; Online communities; Communicative functions of social media; and, Theoretical framework.

History of School-based Agricultural Education

At the turn of the 20th century, secondary education in agriculture was developing rapidly and beginning to broaden (True, 1929). After receiving inconsistent local and state funding, agricultural education in secondary schools began to receive federal funding after the passage of the Smith-Hughes act of 1917 (Talbert et al., 2007). With the passage of the Vocational Education Act of 1963, agricultural education was first defined as more than farming, and the scope of agricultural education was broadened (*History of California Agricultural Education*, n.d.; Talbert et al., 2007). "Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems" (National FFA Organization, n.d., para. 1). Today, more than 800,000 students enrolled in agricultural education, all 50 states provide a systematic program of instruction in and about agriculture (National FFA

Organization, n.d.). The complete agricultural education program is made up of three parts, identified in the three-component model in Figure 1. Each of the three components of agricultural education is an important part of a complete program (Croom, 2008).

In the past ten years, the number of students in California agricultural education has increased by nearly 50% from 65,859 students during the 2008-09 school year, to 92,619 during the 2018-2019 school year (*History of California Agricultural Education*, n.d.). The beginning of agricultural education in California dates back before the passage of the Smith-Hughes Act. In 1916, 93 secondary schools in California offered agricultural education (*History of California Agricultural Education*, n.d.). At the first National FFA Convention in 1928, California became the fourth chartered association in the national organization (*History of California Agricultural Education*, n.d.; National FFA Organization, 2018). Additionally, the California Agricultural Teachers' Association began in 1920, and 100 years later the association continues to provide leadership to the profession and professional development for its members (*History of California Agricultural Education*, n.d.). In 1981, the California Agricultural Teachers' Association hired an executive director to serve the association, becoming the first state to hire an executive director for an agricultural teachers' association (*History of California Agricultural Education*, n.d.).

Roles of School-based Agricultural Education Teachers

An agricultural education teacher assumes various responsibilities that extend outside of the classroom including educator, coach, and advisor (Delnero & Montgomery, 2001; Talbert et al., 2007; Terry & Briers, 2010). Talbert et al. (2007) identified 10 roles and responsibilities of agriculture teachers: (a) Being a school team member, (b) Planning

and developing a program, (c) Preparing to teach classes, (d) Delivering instruction, (e) Evaluating student progress, (f) Advising student organizations, (g) Supervising student experiences, (h) Managing resources, (i) Relating to publics, and (j) Practicing citizenship.

Terry and Briers (2010) identified the agriculture teacher (a) as a facilitator of learning, (b) as a student organization advisor, (c) as a supervisor of experiential learning, (d) as a program administrator, (e) in a caring role, (f) as a professional, and (g) as a total person. They further stated agriculture teachers invest a multitude of time and effort into the various roles of the profession, and these roles are not bound by classroom walls.

Delnero and Montgomery (2001) identified three categories (classroom and lab instruction; FFA and SAE; and administration and professionalism) as the theoretical structure for their perceptions of work in agricultural education study. Using Q method, participants ranked statements developed from literature and SBAE in-service teachers describing various SBAE teacher responsibilities. They found a difference in the perceived needs for professional development among three teacher factor groups that emerged from the Q-sorts (Delnero & Montgomery, 2001). Academic teachers in their study viewed professional development as more formal and instructional, while teachers who sorted to the activities coach and vocational mentor arrays viewed networking as a more important aspect of professional development.

Professional Development Needs in Agricultural Education

The National Association of Agricultural Educators (NAAE) offers multiple opportunities for professional development to its members (National Association of Agricultural Education, n.d.). In addition to targeted professional development by career

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phase, the NAAE also offers regional and national conferences with professional

development opportunities (National Association of Agricultural Education, n.d.).

Furthermore, some state teacher associations, California included, offer in-service

opportunities at their annual teacher conferences, as well as specialized professional

development for student teachers and early career teachers (California Agricultural

Teachers' Association, n.d.).

Professional development is crucial for agricultural education teachers because of

ever-changing technology and advancements in the agricultural industry (Talbert et al.,

2007). Previous research states in-service needs should be determined on a regular basis

(Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Joerger, 2002). Moreover,

Birkenholz and Harbstreit (1987) recommended in-service coordinators should

"periodically monitor the needs of beginning teachers as they change over time and

provide assistance based upon current needs" (p. 48). Claycomb and Petty (1983)

identified the changes in assistance needed for teachers across a three-year longitudinal

study. They found pre-service teachers identified human relations as the lowest need for

assistance but increased in priority as the teachers gained experience in the profession

(Claycomb & Petty, 1983).

SBAE Teacher In-service Needs by Career Phase

SBAE beginning teacher needs are often different than their mid-career and late-

career colleagues (DeLay & Washburn, 2013; Golden et al., 2014; Layfield & Dobbins,

2002). Boone and Boone (2007a) identified 20 problems of beginning and practicing

SBAE teachers, of which, administrative support, discipline, and class preparations

ranked highest for beginning teachers, and shifted to administrative support, student

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motivation, time management, paperwork, and budgets-funding as the top five problems practicing SBAE teachers face.

Figland et al. (2019) sought to determine what Louisiana agriculture teachers desired in terms of classroom-based professional development. They found SBAE teachers differ in their professional development needs based on years of teaching experience and noted professional development organizers should consider years of teaching experience when planning professional development.

Beginning Teachers

Garton and Chung (1996) stated: "research is needed to assess the in-service [*sic*] needs of today's beginning agriculture teachers" (p. 53). They further contended, "the results will be valuable in assessing and developing beginning teacher programs" (p. 53).

Multiple studies have been completed assessing the in-service needs of SBAE teachers. Touchstone (2015) identified 21 professional development needs of beginning SBAE teachers in Idaho across three areas; Teacher Skills and Knowledge, Personal Skills and Professional Development, and Program Area Concerns. Touchstone (2015) also identified traditional training and induction programming may not be sufficient enough to address beginning teachers' needs.

Joerger (2002) determined the perceived in-service needs of beginning SBAE teachers within two cohorts after their first completed semester of teaching. The beginning teachers in the study warranted additional in-service training, especially in program management and teaching and classroom management (Joerger, 2002). Joerger (2002) recommended an assessment of in-service needs for all new cohorts of beginning SBAE teachers to assist in planning and implementing in-service activities.

Mid-Career Teachers

DeLay and Washburn (2013) identified a need for professional development designed specifically for mid-career teachers. Smalley and Smith (2018) identified Experiential Learning and Program Design and Instruction as two areas in which professional development was most desired for mid-career teachers. "Mid-career teachers are at a point in their careers where they are comfortable with the expectations for classroom instruction and leadership development within a complete agricultural education program and are ready to focus additional energy toward experiential learning opportunities" (A. R. Smith & Smalley, 2018, p. 316).

Smalley and Smith (2017) identified lack of time, course planning, and programmatic expectations as challenges for mid-career agriculture teachers in their study. Teachers in their study indicated they networked through the *NAAE Communities of Practice* for support, but still reported a need for professional development to network and reenergize.

Stair et al. (2012) stated it is "impossible to assume that teachers [*sic*] concerns can be completely addressed within a teacher preparation program. Instead focusing on teacher development in stages can allow for long-term support" (p. 160). They expressed further the critical importance of mentoring programs to address the ever-changing needs of beginning teachers.

In addition to establishing and maintaining support groups, beginning teachers struggled with managing stress, balancing work and personal life, and finding adequate preparation time at the beginning of the school year (Myers et al., 2005). Beginning

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teachers also varied greatly in the problems they faced, most likely due to the demands of different programs (Myers et al., 2005).

SBAE Teacher In-service Needs by Competency Area

Competencies not acquired through formal teacher training often are addressed through in-service training provided for SBAE teachers (Birkenholz & Harbstreit, 1987; Duncan et al., 2006; Garton & Chung, 1996; Joerger, 2002; Roberts & Dyer, 2003). Garton and Chung (1996) asked beginning teachers and state staff members in agricultural education to assess the perceived level of importance and level of competence of 50 professional competencies identified in previous research. They calculated discrepancies between the importance and competence scores to identify the perceived in-service needs of beginning teachers. Five of the top twelve competencies identified with a greater need for in-service education were related to instruction. They surmised, the "ranking of the inservice [*sic*] needs as perceived by beginning agriculture teachers did not correspond with the rankings of the inservice [*sic*] needs as perceived by the Joint State Staff (Garton & Chung, 1996, p. 57).

Roberts and Dyer (2003) identified middle and high school SBAE teacher in-service needs by five categories: FFA and SAE supervision, instruction and curriculum, program planning and management, teacher professional development, and technical agriculture. They recommended in-service sessions be directed specifically to meet the individual needs of middle or high school teachers, especially in the areas of instruction and curriculum and technical agriculture (Roberts & Dyer, 2003).

Golden et al. (2014) identified the greatest perceived need for SBAE teacher in-service was writing grant proposals. This finding is consistent with research by Cannon et

al. (2010) and Robert and Dyer (2003) who both identified teachers' need for grant proposal assistance to increase program financial support with grant money.

Duncan et al. (2006) analyzed Georgia SBAE teachers' perceived importance of professional SBAE teaching competencies to help identify in-service needs. The competency areas they identified in their study were technical agriculture, teaching and learning, and program management (Duncan et al., 2006). They also recommended other states examine their pre-service and in-service preparation to determine the specific needs of SBAE teachers in their state (Duncan et al., 2006).

In addition to the need for in-service for technical competencies, Davis and Jayarante (2015) outlined globalization of agriculture as an in-service need for SBAE teachers, including the need for "a better understanding of the role of agriculture in global food security for preparing students to face food security challenges realistically" (p. 55). They further contended teaching the importance of time and stress management in in-service training for SBAE teachers (Davis & Jayarante, 2015).

Roberts and Dyer (2004) identified and compared the self-perceived in-service needs of traditionally and alternatively certified SBAE teachers and found traditionally certified teachers indicate greater in-service needs than their non-traditional counterparts. Stair et al. (2019) also examined the difference in in-service needs of traditionally and alternatively certified teachers in Louisiana and found traditionally certified teachers felt a greater need for professional development in the area of program management over their alternatively certified teaching peers.

Birkenholz and Harbstreit (1987) used a survey research instrument to identify specific topics for beginning teacher in-service programs for teachers in Missouri. The

beginning teachers in their study identified skill development in the areas of agribusiness management and electricity, training student teams for FFA contests, and supervision and assisting students with recordkeeping of student projects as the most needed beginning teacher in-service areas.

Smalley, Hainline, and Sands (2019) evaluated Iowa SBAE teachers' professional development in the areas of teaching, classroom management, and technical agriculture. In their study, the items with the highest perceived training needs were centered primarily around teaching knowledge and skills in biotechnology, agribusiness, and agricultural mechanics. They also identified the training need for teachers to integrate current advances in agriculture technology into curriculum and teach about public issues (Smalley et al., 2019).

Harris (2008) identified the professional development needs of SBAE teachers by career development events (CDEs) in Kansas. He found teachers were most interested in the CDEs with the lowest participation at the state contest, agricultural sales, agribusiness management, and food science and technology (Harris, 2008). He suggested to offer professional development in the form of a weeklong professional development and/or a summer graduate course for teachers to increase their knowledge of CDEs (Harris, 2008).

DiBenedetto et al. (2018) conducted a needs assessment for SBAE teachers. They found professional development needs varied dependent upon the types and experience level of the teachers. They also found six competencies "consistently recurred during the 32 year time period from 1983 to 2015 which included FFA program management, developing public relations programs, program administration/general administrative tasks, SAE development/supervision, managing student behavior, and computer

technology" (p. 67). They also suggested further research in addressing emerging needs in 21st century competence and working with special needs.

Smalley and Smith (2017) found teachers reported a desire to fulfill professional development needs by networking, reenergizing, and improving stress management. Specifically, teachers reported participating in professional organizations, joining teacher listservs, and networking through the *NAAE Communities of Practice* for engagement and support.

Collaboration

"Collaboration is a consistent and persistent means of professional development" (DeLay & Washburn, 2013, p. 113). Collaboration and support from others within the SBAE profession is a critical tool for teacher development and the emotional support can reduce job dissatisfaction and teacher burnout (DeLay & Washburn, 2013; Kelly & Antonio, 2016). Collaboration removes the barrier of classroom walls and connects teachers in a variety of contexts related to common professional interests (DeLay & Washburn, 2013). Common planning time and collaboration with other teachers in the same subject area is an effective factor in reducing teacher turnover (Ingersoll & Smith, 2003). Ingersoll and Smith (2004) identified having a mentor from the same field of study and being part of an external network of teachers were prominent factors in reduced teacher turnover. Boone and Boone (2007) identified professional brotherhood as a motivating factor for teachers who remain in the profession.

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Mentorship

The lack of teacher induction and mentor programs is one of the major contributing factors to teacher attrition (Darling-Hammond, 2003). Ingersoll and Smith (2003) contended recruitment of teachers will only go so far in closing the teacher shortage gap. They stated, "pouring more water into the bucket will not do any good if we do not patch the holes first" (Ingersoll & Smith, 2003, p. 33). To retain new teachers, mentors are "especially crucial" because "life for beginning teachers has traditionally been described as a sink-or-swim proposition" (Ingersoll & Smith, 2003, p. 33).

Mentoring is an effective way to help people develop in not only their professional career but also their personal lives, including the growth of the protégé's self-efficacy (Kenahan et al., 2016). Stair et al. (2012) expressed the critical need for establishing and maintaining mentoring programs to address the ever-changing needs of new teachers. Mentoring as a form of formal support helps build the self-confidence of beginning teachers and lessens the feelings of insignificance and isolation often experienced by beginning teachers (Burris et al., 2006). This feeling of isolation led teachers to entertain the idea of leaving the profession, especially when working independently for prolonged periods of time (DeLay & Washburn, 2013).

The manner in which participants are connected through mentorship programs is a critical component to the success and effectiveness of the program (Bearman et al., 2007). Desimone et al. (2014) found teachers preferred help, both formal and informal, that was nearby and consistently available and spend substantially more time with mentors who are in the same building, compared to those at a different school.

Tummons et al. (2016) expressed the importance of using perceived similarity as a primary criterion when matching mentors and beginning teachers. Despite relationships with other subject area teachers on campus, SBAE teachers desire regular interaction with others in agricultural education (DeLay & Washburn, 2013). "Ideally, the beginning agriculture teacher is paired with an experienced agriculture teacher as a mentor. This is not always practical, as the beginning teacher may be the only agriculture teacher in the school system" (Talbert et al., 2007, p. 34).

Talbert et al. (2007) added regardless of the in-service provided, camaraderie and socialization should be encouraged in beginning teacher in-service programs. "Beginning agriculture teachers can be isolated both within their schools and geographically" (Talbert et al., 2007, p. 35) so giving them a chance to build connections can help them navigate the experiences they are going through. Tummons et al. (2016) shared future research in mentoring of SBAE teachers should "investigate the variation in content and format of mentor/protégé interactions" and "examine how mentors interact with beginning teachers" (p. 80).

Electronic Mentorship

Electronic mentoring (E-mentoring) is the process of using electronic means as the primary channel of communication (Hamilton & Scandura, 2003). E-mentoring has become more popular because it can connect people across geographic distances (Bearman et al., 2007). By taking advantage of technology, E-mentoring eliminates geographical constraints, meaning individuals can connect regardless of their location (Hamilton & Scandura, 2003). E-mentoring "opens the possibility for relationships that cross boundaries of time, geography, and culture unlikely to happen under the classical

model" (Bierema & Merriam, 2002, p. 220). Message boards, like the CAEDL Facebook group, are one type of interaction used in E-mentoring (Hamilton & Scandura, 2003). "E-mentoring is not necessarily based on a wise elder dispensing advice and instruction to a protegé. Rather it is a mutually beneficial relationship that is highly versatile and can be adapted to work in a variety of settings" (Bierema & Merriam, 2002, p. 219).

Although beginning teachers receive support through induction programs, induction programs vary greatly in duration, scope, intensity, and sponsorship (Ingersoll & Smith, 2004; Tummons et al., 2016). "Utilizing social networking sites like Facebook can enhance the induction support and professional development of novice teachers" (Staudt et al., 2013, p. 158).

Online Communities

Professional development programs can be costly and are often limited to geographical and time constraints (Talbert et al., 2007). Darling-Hammond (2005) asserted, "teachers have almost no in-school time for professional development for professional learning or collegial work" (p. 240). Teachers must often commit time for workshops and courses that take place during designated professional days, or during time outside of the regular school day, specifically after school and on the weekend (Darling-Hammond, 2005). Online communities fulfill teachers' opportunity to learn from their peers with access to like-minded professionals through discussion (Duncan-Howell, 2010). Online learning communities have the potential to provide support to teachers by facilitating "informal knowledge sharing, the transfer of expertise and experiences, and the exchange of ideas in ways that contribute to teachers' continual professional learning" (Bishop, 2007, p. 26). Online communities are also attractive to

teachers burdened by the cost of professional development as teachers make use of existing networks that are freely available and at no personal cost to them (Duncan-Howell, 2010).

"With online communities set to become an increasingly important aspect of professional development, there is a need to continue to develop our understanding of this existing evidence base" (Lantz-Andersson et al., 2018, p. 304). "Social networking forums can help reveal how online tools and places shape the ways in which individuals learn from and with one another" (Gerber et al., 2017, p. 25). Communities of teachers created online are a form of "bottom-up initiatives involving a group of practitioners who chose to come together to discuss, share information and work together (Lantz-Andersson et al., 2018, p. 304). Online communities are an active learning environment that provides a source of professional learning for teachers and can offer opportunities for peer support and guidance (Duncan-Howell, 2010).

Social Media

The term *social media* refers to "media which is primarily used to transmit or share information with a broad audience, while social networking is an act of engagement as people with common interests associate together and build relationships through community" (Edosomwan et al., 2010, para. 18). "Communication is a central aspect of online social networking sites that can be facilitated through posts, comments, messages, and chat options" (Gerber et al., 2017, p. 25).

Facebook launched in April of 2004, and in less than one year, one million people were active on the platform (Facebook, 2020). The number of monthly active Facebook users in the United States reached 248 million with nearly 2.5 billion active monthly

users worldwide at the end of 2019 (*Facebook Users Worldwide 2019*, n.d.). *Facebook Groups* were introduced in October 2010 (Facebook, 2020). "Groups are a place to communicate about shared interests with certain people" (Facebook, 2020).

In 2017, Facebook launched a new mission statement, "Give people the power to build community and bring the world closer together." (Facebook, 2020). Social networking fosters relationships and brings together people with shared interests (Staudt et al., 2013). Facebook increases access to individuals and information that would not be as readily available without the connectivity of social media (Staudt et al., 2013).

Facebook Groups

"If the goal is to ensure novice teachers have ready access to continued program support and contact, extended mentoring, and private spaces for professional discourse, then Facebook can serve as a viable platform to satisfy those needs" (Staudt et al., 2013, p. 161). Hart and Steinbrecher (2011) stated, "in what ways can Facebook groups provide an ongoing community of practice that is not limited by the length of a single course or an entire degree program?" (p. 328). Previous research found teachers use Facebook for three major purposes: (a) to collaborate and generate ideas, (b) to connect with and support one another, (c) and to seek professional advice (Hart & Steinbrecher, 2011; Kelly & Antonio, 2016). Facebook provides opportunities for teacher collaboration through the ability to share resources, post questions and comments, and engage with peers in smaller communities through the Groups feature (Staudt et al., 2013). Facebook presents additional opportunities to build social capital based on common interests, and to remain connected to individuals teachers interact with and find common ground with at face-to-face meetings (Staudt et al., 2013).

Hart and Steinbrecher (2011) stated teachers engage in meaningful and timely conversations through Facebook that provide resources for their learning and support needs. "Facebook has all the tools necessary to create an online community to provide support from experts, professional training, resources, and peer interaction desperately needed by struggling novice teachers" (Staudt et al., 2013, p. 158).

Communicative Functions of Social Media

Saxton and Waters (2014) employed a message-level analysis to analyze different types of Facebook statuses. They identified five categories of communicative functions present in an organization's Facebook statuses; Information sharing, Promotion, Mobilization, dialogue, community-building. Information-sharing is defined as a one-way messaging strategy intended to share information using text alone or in combination with other forms of multimedia (Saxton & Waters, 2014).

Morris et al. (2010) identified the types of questions people ask within their social networks. They found the most popular types of questions asked were recommendation and opinion questions. They further defined the question types and included factual knowledge, rhetorical, invitations, favors, offers, and social connections as question types in their study. In addition to identifying the types of questions, Morris et al. (2010) also identified popular question topics, or subject matter, of the questions asked within participants' social networks.

Ellison et al. (2013) defined Mobilization as a "request for action related to provisions of social, informational, or other forms of support or assistance" (p. 159). Ellison et al. (2013) used inductive coding to condense the question types identified by

Morris et al. (2010) and derived five characteristics of Mobilization posts as shown in

Figure 3.

Figure 3

Categories, Functional Definitions, and Examples of Mobilization Posts

Request Type	Functional definition Examples (created for this paper based on observed patterns)
Recommendation & Social Connection	A subjective, open-ended request for suggestions, or, in the case of referrals/social connections, a request to be referred or introduced to a specific person.
	"What movie should I watch tonight?" "Can anyone recommend a good local plumber?"
Factual Knowledge	A question posed that assumes and expects a correct answer; objective as opposed to subjective.
	"Does anyone know where *Grease* is playing in town?" "What's the weather going to be like for the game tomorrow?"
Social Coordination, Invitation, & Offer	A search for others with similar agendas or motives or for company (an invitation), with an assumed goal of collaboration or meeting.
	"Who wants to get together after the conference for some drinks?" "Where should we meet before the concert Saturday?"
Favor/Request/ Collective Action	A request for help or action from one's network for any number of things, including physical assistance, needed items, or emotional support.
	"I need to get to the airport tomorrow morning and my car is on the fritz. Who can give me a ride pretty please?" "Can anyone loan me their copy of *Romeo and Juliet* this weekend? I need to read it for class."
Opinion/Poll	A request for an opinion to be given in reaction/response to a status update; a vote or a choice between two alternatives to be made; or a general solicitation of what people are doing.
	"What do people think of Proposition 4?" "Chicken pot pie or beef stew for dinner?"

Note. Adapted from Ellison et al. (2013)

Lampe et al. (2014) further adapted the typology set out by Morris et al. and

Ellison et al. by categorizing *Mobilization Requests* as "one or more of the following;

recommendations, factual knowledge, social coordination, favor/request, and

opinion/poll" (p. 7). Lampe et al. (2014) found Mobilization posts of different categories

vary substantially in the number of comments they receive and in the receipt of likes on a

post (p. 9). This variation in comment count is dependent on the characteristics of the

message itself, including the author's communicative intent of the post (Arguello et al.,

2006). In return, the value of the community to its members and the overall success of an

online community is dependent on the engagement of members through post comments

(Arguello et al., 2006; Bishop, 2007; Booth, 2012). This valuable exchange of comments

lends itself to increasing the capital or worth of the social network communities, which is a product of members asking and answering resource requests within the online community (Lampe et al., 2014).

More recently, Meyer et al. (2017) mobilized the communicative functions set forth by Saxton and Waters to investigate the conversations on the Teach Ag Facebook page during Teach Ag Day. Their research compared audience engagement of posts using mean scores for reactions, comments, and shares. All posts in their study received more reactions than comments (Meyer et al., 2017).

Theoretical Framework

This study is influenced by the theory of Media Ecology. The term Media Ecology was first introduced by Neil Postman but was born from the work of Marshall McLuhan (R. L. West & Turner, 2018). Media Ecology surveys how communication technologies affect the sharing of information and how the technologies impact individuals in society, including human perception, feeling, emotion, and value (Postman, 1979; R. L. West & Turner, 2018). "Media Ecology is a network of ideas, individuals, and publications, and it is possible to follow the links of the network in any number of directions" (Strate, 2004, p. 5). Technologies create a symbiotic relationship first described by Marshall McLuhan where "we create technology, and in turn, technology recreates who we are" (R. L. West & Turner, 2018, p. 437). The product of this symbiotic relationship is the theory of Media Ecology (Strate, 2004).

"Media can organize societies socially" (West & Turner, 2018, p. 441). People get the information they require from constantly evolving media (Velázquez et al., 2018). Part of this evolution includes an increase in interpersonal communication because of

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access to electronic technologies (Strate, 2004). Electronic media has broken down barriers and created a vast environment of shared information, thus changing social roles and relationships originally based on the accessibility of information (Strate, 2004). "Media ecology is the study of human environments" (Postman, 1979, p. 186) and in this electronic era "communities in different geographic locations around the world are able to remain connected" (R. L. West & Turner, 2018, p. 444).

Media Ecology explains that media ties together the world into a global village (Strate, 2004; Velázquez et al., 2018; R. L. West & Turner, 2018). McLuhan (1962) discussed the transition to electronic media from print media and said, "the new electronic interdependence recreates the world in the image of a global village" (p.43). With the initiative by Facebook to "give people the power to build community and bring the world closer together" (Facebook, 2020), McLuhan's ideas are even more relevant today. Strate (2004) identified the introduction of the *global village* as, "one of McLuhan's most enduring ideas" (p. 6).

McLuhan asserted media play an instrumental role in the organization of societies (R. L. West & Turner, 2018). Even before the advancements in computer and communication technologies today, like Facebook, McLuhan sought to answer the question, "What is the relationship between technology and members of a culture" (R. L. West & Turner, 2018, p. 437)? The format of media, including social media and more specifically Facebook, changes society by organizing the way we live our lives, including what we communicate in our social organizations (Strate, 2004; R. L. West & Turner, 2018).

CHAPTER III

METHODOLOGY

Chapter III is a presentation of the methodological approach and decision process

carried out as the study was conducted. Included in this chapter is the description of the

population, research design, data collection, reliability of the study, and a description of

the data analysis. The study was reviewed by the Oklahoma State University Office of

Research Compliance and the Institutional Review Board (IRB). The protocols and

procedures for data collection were deemed exempt and the study was approved.

Population

The population of this study was Facebook posts authored in the CAEDL

Facebook group from January 1, 2017, to December 31, 2019. In total, 870 posts were

downloaded and analyzed for this study.

Research Design

This study employed a quantitative content analysis to meet the identified

research objectives. Content analysis, both qualitative and quantitative, is a research

method that uses a systematic approach and a set of procedures to sort data through a

series of defined steps in order to make valid inferences from text (Croucher & Cronn-

Mills, 2019; Kerlinger & Lee, 2000; Weber, 1990). Riffe et al. (1998) defined

quantitative content analysis as:

> The systematic and replicable examination of symbols of communication, which
>
> have been assigned numeric values according to valid measurement rules and the
>
> analysis of relationships involving those values using statistical methods, to
>
> describe the communication, draw inferences about its meaning, or infer from the
>
> communication to its context, both of production and consumption. (p. 25)

Quantitative content analysis is concept-driven (Croucher & Cronn-Mills, 2019) and

"reduces communication phenomena to manageable data from which inferences may be

drawn about the phenomena themselves" (Riffe et al., 1998, pp. 23–24). Although

content analysis can be used to identify categories and themes, it cannot provide causality

for how or why categories or themes emerge or develop (Croucher & Cronn-Mills, 2019).

I chose to analyze posts in the CAEDL because of the accessibility to the group

and familiarity with California agricultural education content. Initially, I sought to

analyze posts from the national *Ag Ed Discussion Lab*, however, I was unable to gain the

level of access to the group needed to carry-out data collection. The three-year period of

posts was chosen to account for differences over time and capture a more holistic

representation of posts in the CAEDL Facebook group. All posts created by members of

the CAEDL Facebook group from January 1, 2017, to December 31, 2019, were

collected and analyzed.

Unit of Analysis

The unit of analysis is defined by the element of that content "based on a definable physical or temporal boundary or symbolic meaning" (Riffe et al., 1998, p. 68). Individual posts from the CAEDL Facebook group were chosen as the unit of analysis to address the purpose of this study. A total of 870 posts from January 1, 2017, through December 31, 2019, were included in the analysis.

Validity and Reliability

The posts are the naturalistic thoughts and shared ideas of the members of the group and represent a multitude of members throughout the state of California. For the 2018–2019 school year, the California FFA website reported 926 agricultural education teachers in the state of California (*History of California Agricultural Education*, n.d.). Although not all agricultural education teachers in California use the CAEDL Facebook group, it does provide an avenue for teachers with questions or seeking advice to find the answers they desire.

This study followed the research protocol from Riffe et al. (1998) and Weber (1990) to assess the reliability of the coding process and subsequent coded data. A more in-depth explanation is included in the data analysis section of this chapter.

Data Collection

The third-party application Sociograph was used to initially record information from the CAEDL Facebook group on January 10, 2020. Sociograph gathered the posts' timestamp, type of post, text, reactions, comments, and shares in a .csv file that formed

the frame for the data. Sociograph was unable to provide critical post information, including types of reactions (Like, Love, Haha, etc.). Thus, post content from Sociograph was sorted by timestamp in reverse chronological order using Microsoft Excel and compared to the live CAEDL Facebook group (California Ag Ed Discussion Lab, n.d.) feed to quantify the types of reactions. Through this process, I realized 40 posts were not included in the Sociograph download. To mitigate this missing information, I compared timestamps and text from the downloaded posts to those on the CAEDL Facebook group wall, and added text, and post characteristics (timestamp, type of post, text, reactions, comments, and shares) from the missing posts to the downloaded excel file. Once all posts were accounted for, they were sorted reverse chronologically and then assigned a post ledger number to assist in the coding process and future analysis. The Microsoft Excel file was used to populate the coding transcript using the mail merge feature in Microsoft Word.

Sociograph does not gather any graphic content from the posts (photos, link previews, shared file previews, and video previews) that provide context to the posts. Therefore, once the downloaded text-based information was included in the coding transcript, I captured screenshots of post content from the live CAEDL Facebook group wall that included elements other than, or in addition to text. This step ensured photos and other visual elements not downloaded with Sociograph were included in the transcript to more accurately assess the context of the posts. This information was crucial in many cases for the content of the CAEDL Facebook group to be classified, as shown in Figure 4.

Figure 4

Example of CAEDL *Facebook Post Requiring Additional Context to Provided Text.*
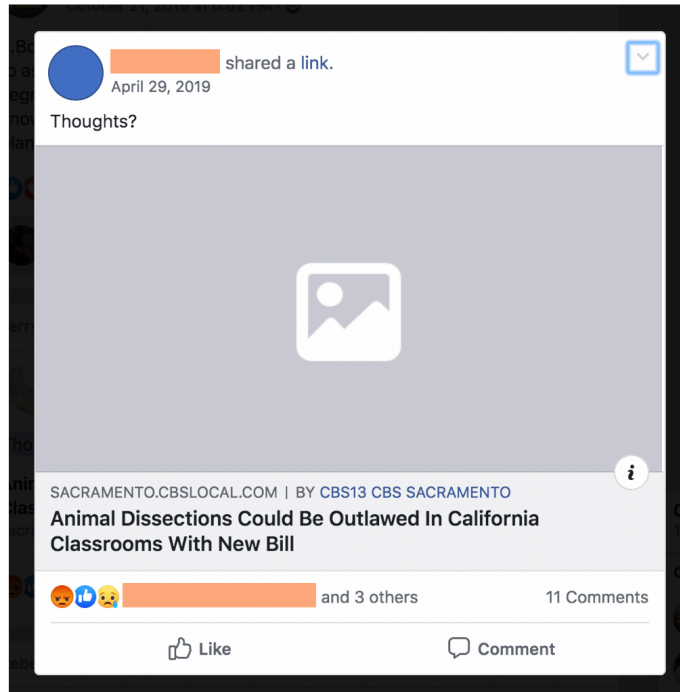
As an administrator of the group, I used the *Insights* feature in the CAEDL

Facebook group to download demographic information for the group on January 10,

2020. A list of members and dates joined was created in Microsoft Excel from the Group

Members page of the CAEDL Facebook group. Once the member list was complete, data

validation in Microsoft Excel was used, along with post ledger numbers, timestamp, and

text, to identify the individual authors of each of the posts sourced by Sociograph. A list

of pseudo names was created to retain authorship counts while also providing anonymity.

Quantitative Coding

The coding protocol was developed and implemented as defined by Weber (1990). Weber (1990) identified eight steps (shown in blue in Figure 5) to be followed in creating and testing a coding scheme. For this study, the following three sections outline the steps taken to follow this model. The relationship between these sections and Weber's (1990) eight steps is shown in the hierarchy of Figure 5, where the green text boxes show the section headings.

Figure 5

Eight Steps to Creating and Testing a Coding Scheme
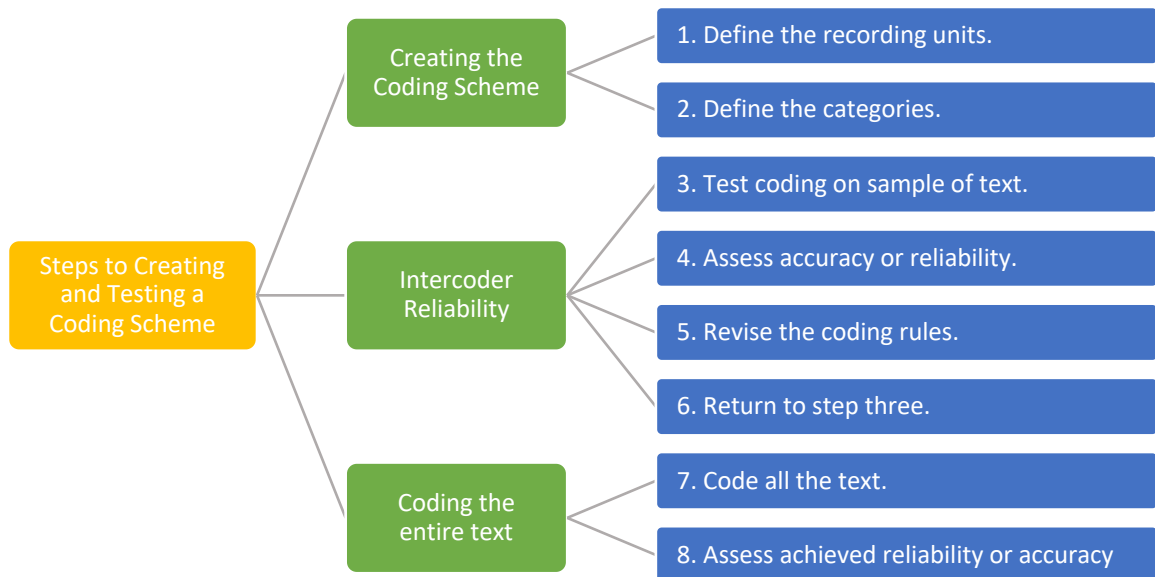
Note. Adapted from Weber, 1990, pp. 21-24

Creating the Coding Scheme

First, the recording units were defined as posts from the CAEDL Facebook group from January 1, 2017, to December 31, 2019. Next, categories for coding were defined using the communicative functions of social media (Ellison et al., 2013; Lampe et al., 2014; Saxton & Waters, 2014) and the SBAE teacher roles defined from the literature. Weber (1990) stated, during the creation of categories, investigators must decide (a) whether the categories are to be mutually exclusive, and (b) how narrow or broad the categories will be. For this study, two coders identified the intent of the post (*communicative function*) and the role of the agricultural teacher (*SBAE teacher role*) that included subcategories representing current practice in the profession. To simplify the coding process, all SBAE teacher role and communicative function categories were set to be mutually exclusive. Categories are shown in the conceptual framework displayed in Figure 6. Sub-categories were developed to further identify each SBAE teacher role category. Croucher (2019) suggested building a coding frame, by first starting with a few pre-set codes based on the research question and then use open coding to allow additional codes to emerge as the study progresses. An additional *Notes* category allowed coders to open code posts, which helped during the negotiation of coding discrepancies.

Figure 6

Roles of an Agricultural Educator Across the Communicative Functions of Social Media
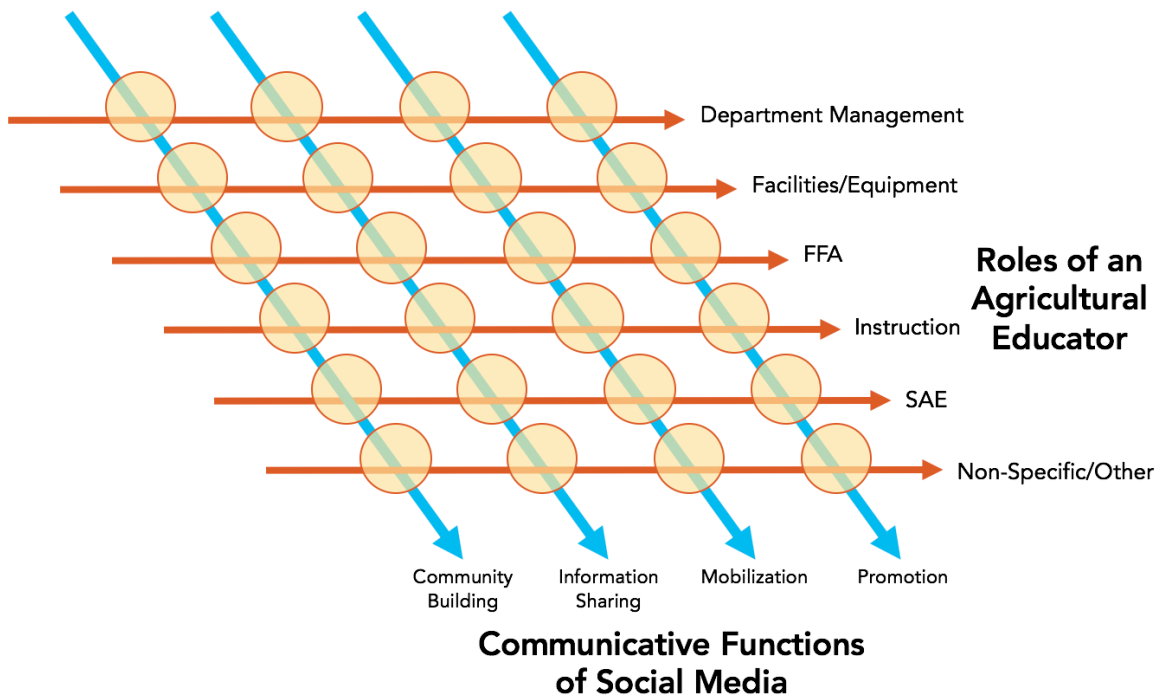
Conceptual Framework

Although both SBAE teacher roles and communicative functions can be utilized to independently describe the posts in the CAEDL, the combination of the two concepts allows for the communicative function of the SBAE teacher role to be revealed. Within the CAEDL Facebook group, members are interacting in the community, e.g. social media ecosystem. By utilizing the roles of the SBAE teacher, the content of the topics of conversation are identified, and the communicative functions of social media help to understand the intent of the communication. The conceptual framework was developed for this study to understand the context and intent of conversations within the community to identify what members are communicating in this social space (Strate, 2004; R. L. West & Turner, 2018).

School-based Agricultural Education Three-circle Model

The three-circle model of SBAE (National FFA Organization, n.d.), combined with research on the roles of SBAE teachers were used to develop the six SBAE teacher role categories used in this study. Although the three areas of SBAE are integral to the success of a complete program (Croom, 2008), the definition of teacher roles goes beyond the three-circle model as shown in the literature (Terry & Briers, Talbert et al., Delnero & Montgomery, 2010). Furthermore, research on the in-service needs of SBAE teachers also identified the many responsibilities of SBAE teachers (Boone & Boone, 2007a; Claycomb & Petty, 1983; DeLay & Washburn, 2013; Figland et al., 2019; Garton & Chung, 1996; Golden et al., 2014; Layfield & Dobbins, 2002; Stair et al., 2012). For the purpose of this study, the roles of the SBAE teacher were defined as Department Management, Facilities/Equipment, FFA, Instruction, SAE, and Non-Specific/Other.

Department management responsibilities of the SBAE teacher encompassed program management, e.g. grants, student contracts, student recruitment, fundraisers, and parent groups. Facilities/Equipment included management of school facilities, e.g. school farm and greenhouse, and purchasing of equipment with special attention to depreciable items, or those with more than one year of life, e.g. floral coolers, welders, greenhouse supplies, animal scales, and buildings. The FFA SBAE teacher role included any activities related to the SBAE leadership component, including career development events, officer teams, and conferences. The Instruction SBAE teacher role category included any consumable resources used for classroom instruction, as well as resources for teacher planning and instruction, e.g. course outlines, grading and assessment, lesson plans, and textbook recommendations. SAE included management and ideas for student

projects, e.g. student record books, student contracts specific to SAEs, and student livestock. Finally, the Non-Specific/Other SBAE teacher role category included posts about teacher certification, job opportunities, teacher professional development, and sharing of general resources. A list of SBAE teacher role categories and subcategories can be found in the codebook for this study located in the appendix.

Communicative Functions of Facebook Posts

The communicative functions of the conceptual framework for this study combined the communicative functions outlined by Saxton and Waters (2014) and Ellison et al. (2013). Specific classifications of communicative functions include Community Building, Information Sharing, Mobilization, and Promotion. The Mobilization communicative function includes five subcategories: Factual knowledge, Favor/Request, Opinion/Poll, Recommendation, and Social Coordination. These subcategories are shown in Table 1.

Table 1

Categories, Functional Definitions, and Examples of Mobilization Posts

Mobilization Category	Functional Definition *Examples of Communicative Function Defined for this Study*
Recommendation	A subjective, open-ended request for suggestions, or, in the case of referrals/social connections, a request to be referred or introduced to a specific person. "What hotel do you recommend for State Convention?" "Which Agriscience textbook do you use in your class?"
Factual Knowledge	A question posed that assumes and expects a correct answer; objective as opposed to subjective. "Where will State Convention take place this year?" "When does registration for MFE/ALA open?"
Social Coordination	A search for others with similar agendas or motives of for company (an invitation), with as assumed goal of collaboration or meeting. "Who is attending the NAAE Meeting in April?" "Who wants to meet after the workshop to write curriculum?"
Favor/Request	A request for help or action from one's network for any number of things including physical assistance, needed item, or emotional support. "Does anyone have A-G Soil Science curriculum they'd be willing to share?" "I am looking for a copy of the FFA Creed in Spanish, does anyone know where I can find it?"
Opinion/Poll	A request for an opinion to be given in reaction/response to a status update, a vote or a choice between two alternatives to be made, or a general solicitation of what people are doing. "What do people think of the changes to the new UCCI curriculum?" "Should students be able to wear FFA shirts instead of Official Dress to meetings?"

Note. Adapted from Ellison et al. 2013 and created for use in this study

Intercoder Reliability

A coder training session was held for the coding team to review the initial codebook and discuss the protocol for individual codes. Coder training is important to "reduce the amount of variability in how [coders] view and interpret data" (McHugh, 2012, p. 276). The codebook included examples of posts and descriptions of codes for each of the areas. The timestamp and assigned post number served as the foundation for the coding sheet in Microsoft Excel. An index for the five communicative functions and five subcategories, as well as an index for SBAE teacher role categories and subcategories, was created so codes could be easily referenced by the coders.

Both coders were school-based agricultural education teachers for seven years and were students in a doctoral program in agricultural education. Although not necessary, my dissertation committee saw value in the coders being familiar with school-based agricultural education to understand the roles of the agricultural education teacher. Furthermore, it was valuable for the coders to have completed a research methods course to understand the deductive coding process. The primary and secondary coder coded 45 practice posts outside the time frame of the study. After the initial practice coding, the greatest discrepancy between coders existed with the communicative functions and with SBAE teacher role secondary categories. Consequently, I decided to limit the posts to one primary SBAE teacher role category and identify subcategories for the single SBAE teacher role category. The codebook was updated to reflect this change.

Next, the primary and secondary coder simultaneously coded another 50 posts that were not part of the study's post population to test the changes to the codebook and to help better relay descriptions of the communicative functions. Once coders were

comfortable with the content, they coded a subset of 60 posts, determined by coding

session length, and checked for intercoder reliability using Cohens kappa (κ). Cohen's

kappa was chosen because unlike simple agreement, kappa controls for chance agreement

among coders (McHugh, 2012). All variables reached a level of satisfactory agreement

using Cohen's kappa ($\kappa > .60$) before moving on to code the remainder of the posts. The

acceptable values of kappa are shown in Table 2. Additional tests of reliability were

conducted again after coding 120 and 400 posts.

Table 2

Suggested Interpretation of Cohen's Kappa.

Cohen's interpretation		McHugh's Interpretation		
Value of Kappa	Level of Agreement	Value of kappa	Level of Agreement	% of data that are reliable
≤ 0	No agreement	0–.20	None	0–4
.01–.20	None to slight	.21–.39	Minimal	4–15
.21–.40	Fair	.40–.59	Weak	15–35
.41–.60	Moderate	.60–.79	Moderate	35–63
.61–.80	Substantial	.80–.90	Strong	64–81
.81–1.00	Almost Perfect	Above .90	Almost Perfect	82–100

Note. Table adapted from (McHugh, 2012, p. 279)

After all of the posts were coded, the reliability of the entire data set ($N = 870$)

was calculated before the coders met to resolve disagreements among codes to build the

final data set for analysis. Weber (1990) stated: "the reliability of the coding should be

calculated before [disagreements] are resolved" (p. 17). Riffe et al. (1998) suggested both

the simple agreement (*OA*) and a statistical agreement (κ) should be reported in content

analysis studies, thus both statistics are shown in Table 3 for all four checkpoints of this

study.

Table 3

Reliability Scores of the CAEDL Quantitative Content Analysis

# of codes	Communicative Function		Primary SBAE Teacher Role		Sub Code SBAE Teacher Role	
	κ	*OA*	*κ*	*OA*	*κ*	*OA*
60	0.8459	0.8833	0.8195	0.8333	0.7682	0.7833
120	0.8339	0.8750	0.7767	0.8333	0.7127	0.7333
400	0.7724	0.7725	0.6787	0.8325	0.6137	0.6375
870	0.7020	0.7747	0.7834	0.8379	0.6205	0.6460

Note. Reliability scores > .60 are considered acceptable (McHugh, 2012).
κ = Cohen's kappa, *OA* = observed agreement

The coding sheets for both coders were compared in Microsoft Excel and a list of disagreements was printed for negotiation purposes. I reviewed the list and corrected any typographical errors before conducting the tests for reliability. A new list of disagreements was then printed. Codes that failed to match between coders were discussed by the coders until consensus was reached.

Data Analysis

Primary Data Analysis Procedures

The negotiated coded posts were combined into a Microsoft Excel database for data analysis using their post number and timestamp. The negotiated communicative functions and SBAE teachers' roles were combined with reactions, comments, and author list for data analysis. Microsoft Excel pivot tables were used to calculate all descriptive statistics, e.g. frequencies, means, and percentages, for each objective, and served as the primary analysis procedure for all data collected. This use of descriptive analysis as the

primary data analysis procedure is consistent with Riffe et al. (1998) who stated, "simple

description of content has its place in communication research" (p. 33).

Secondary Data Analysis

Statistical Package for Social Sciences (SPSS) version 20 was used to calculate

statistical significance for Objectives 1, 2, and 8. Analysis of covariance was used for

Objectives 2 and 8 to control for the increase in members in the CAEDL Facebook group.

A repeated measures ANOVA was conducted for Objective 2 to test for significance in

the number of posts per year and month.

CHAPTER IV

FINDINGS

Chapter IV is the presentation of results based on the objectives of the study. Findings are organized by objective with data presented in tables, figures, and narrative form.

Findings Associated with Objective 1

The first objective of this study was to describe the selected characteristics (i.e., age and gender) of members of the CAEDL Facebook group.

As of January 10, 2020, 698 Facebook users were members of the CAEDL Facebook group. Gender and age characteristics were provided for 694 members from Facebook insights. More than two-thirds of group members who reported age and gender in their profile (n = 694) were female (n = 496, 71.47%). Males represented 28.53% (n =198) of the members. Nearly one-half of the 694 members included in the download of member characteristics (n = 321, 46.25%) were between 25 and 34 years of age. Table 4 displays the distribution of members' ages and gender across all Facebook Insight determined groups.

Table 4

Selected Member Characteristics of the CAEDL Facebook Group

Age Range	Women		Men		Total	
	n	% of total	n	% of total	n	%
18–24	58	8.36	13	1.87	71	10.23
25–34	253	36.46	68	9.80	321	46.25
35–44	113	16.28	54	7.78	167	24.06
45–54	47	6.77	24	3.46	71	10.23
55–64	18	2.59	26	3.75	44	6.34
65+	7	1.01	13	1.87	20	2.88
Total	496	71.47	198	28.53	694	

Note. Member characteristics were provided by Facebook Insights, not all members allow permissions for Facebook Insights for use in analysis

From the time the group began in June of 2016, 255 members retained membership in the CAEDL Facebook group until data were collected on January 10, 2020. The 698 members of the group on January 10, 2020, represent the total number of members who remained in the group from their join date and does not include members who joined and left the group during this time frame.

The greatest increase in membership following the initial membership drive occurred in July 2019 ($n = 38$). The months with the greatest average number of new members joining the group across the three years of posts in were June ($M = 26.00$), July ($M = 23.00$), and August ($M = 22.00$). There were three months, March 2018, November 2018, and December 2019, in which only one new member joined the group. For the period included in this study, the month with the lowest average frequency of new members joining the group was February ($M = 4.00$). These data are displayed in Table 5.

Table 5

CAEDL Group Membership Joining by Month

Month	2016	2017	2018	2019	2020	Total	M^a
January		10	11	5	2	28	6.00
February		4	6	2		12	4.00
March		5	1	4		10	3.33
April		2	8	13		23	7.66
May		10	3	4		17	5.66
June	255	27	25	26		333	26.00
July	4	25	6	38		73	23.00
August	3	26	26	14		69	22.00
September	7	10	9	12		38	10.33
October	5	6	6	13		30	8.33
November	12	5	1	9		27	5.00
December	4	29	4	1		38	11.33
Total	290	159	106	141	2	698	10.50

Note. Does not account for members that left the group, only includes the add dates for current members as of January 10, 2020.
[a] Reflects the average number of members added per month based on the time frame of study, January 1, 2017, to December 31, 2019

The relationship of the increase in membership from one month to the next compared to the average membership increase per month is also shown in Figure 7. The steeper slope is found typically in the months of June, July, and August and depicts a greater increase in membership during those months. A less steep slope signifies less increase in membership, specifically in the first few months of each year, January to April. However, in 2018, there is a noticeable change of slope between June, July, and August, which signifies a lull in membership growth. Additionally, a noticeable spike occurs in December 2017 when the second most members were added to the group in a single month ($n = 29$).

Figure 7

Growth of Membership in the CAEDL Facebook Group
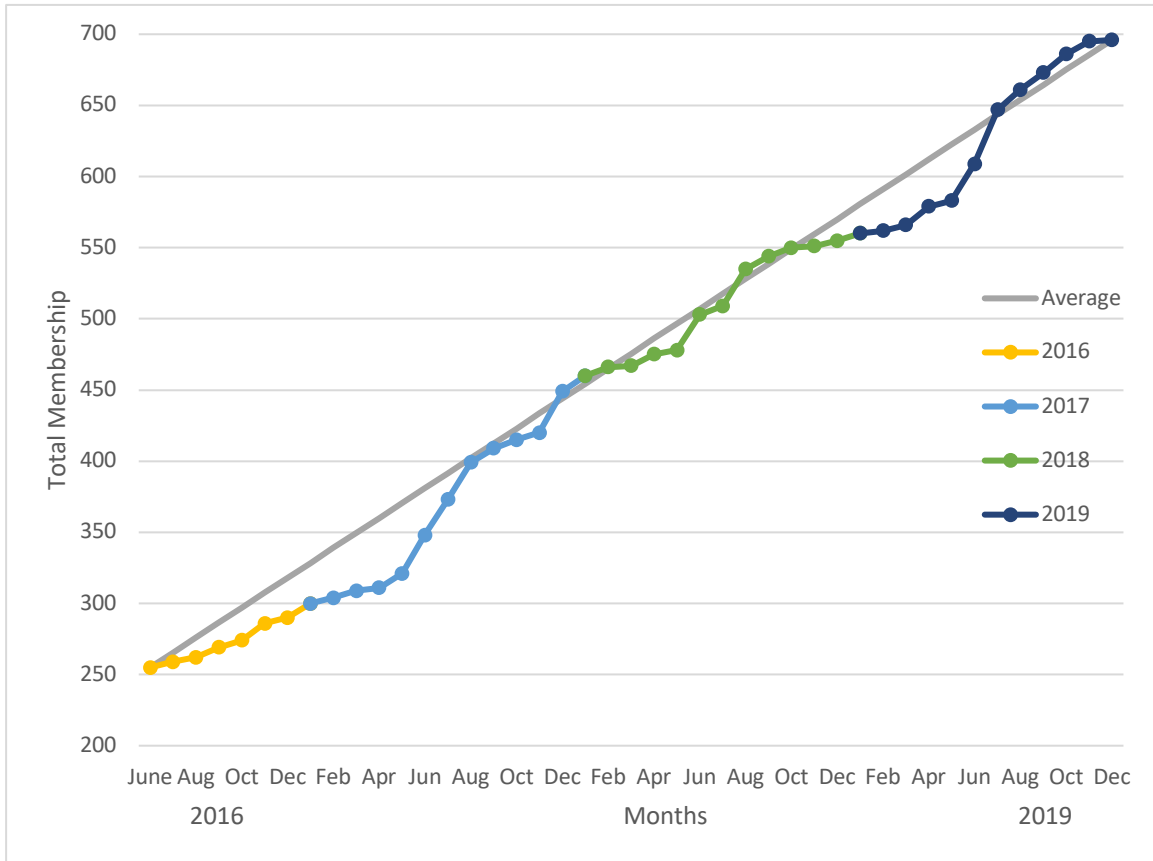
Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.

Findings Associated with Objective 2

The second objective of this study was to describe the use of the CAEDL from January 1, 2017, to December 31, 2019. Use is defined as posting to the group's Facebook page. A total of 870 posts from January 1, 2017, to December 31, 2019, were coded. After coding for communicative functions and roles of the SBAE teacher, the coders determined 866 posts contained usable information. Four posts (#507, #594, #630, and #828) were removed from the database before data analysis. Post #594 contained no

content, and posts #507 and #630 contained broken links to content and were unable to be

coded. Post #828 was an administrative post that updated the name of the group from

California Ag Ed Discussion Lab to *California Ag Ed Discussion Lab (CATA Members*

Only) (CAEDL).

Number of Posts per Year

Post count per year increased by 183 posts (from 132 to 315) from 2017 to 2018,

and by 104 (from 315 to 419) posts from 2018 to 2019. When comparing the number of

posts per year, 2019 ($n = 419$, 48.38%), had more than three times the number of posts

than 2017 ($n = 132$, 15.24%). These data are displayed in Table 6.

Table 6

Number Posts by Year in the CAEDL Facebook Group

			Posts per month	
Year	*n*	*%*	M	SD
2017	132	15.24	11.00	7.30
2018	315	36.37	26.33	11.96
2019	419	48.38	34.92	7.37
Total	866		24.08	13.40

Note. Data represent the time frame of the study, January 1,
2017, to December 31, 2019.

Analysis of covariance was used to test the effect of year on the number of posts

made by month when controlling for the number of members in the group. The

observations were independent, failed Shapiro Wilk's test of normality but remain

normally distributed based on skewness ($< |\pm1.96|$) and kurtosis ($< |\pm1.96|$) of a sample

size less than 50 (Kim, 2013; S. G. West et al., 1995). The data had equal variances

(based on Levene's statistic, $p > .05$), and the dependent variable (number of posts) and

covariate (total membership) had a linear relationship as shown in Figure 8. All groups had a positive regression coefficient that were somewhat equal (2017, $B = .084$; 2018, $B = .075$; 2019, $B = .024$) and there was no interaction between the dependent variable and the covariate ($p > .05$). Results of the ANCOVA suggest the number of posts each month was not statistically significantly different across years, once the number of members in the group was controlled for ($F(2,32) = 0.74$, $p > .05$).

Figure 8

Relationship of Number of Posts per Month Across Number of Members in CAEDL *Facebook Group*
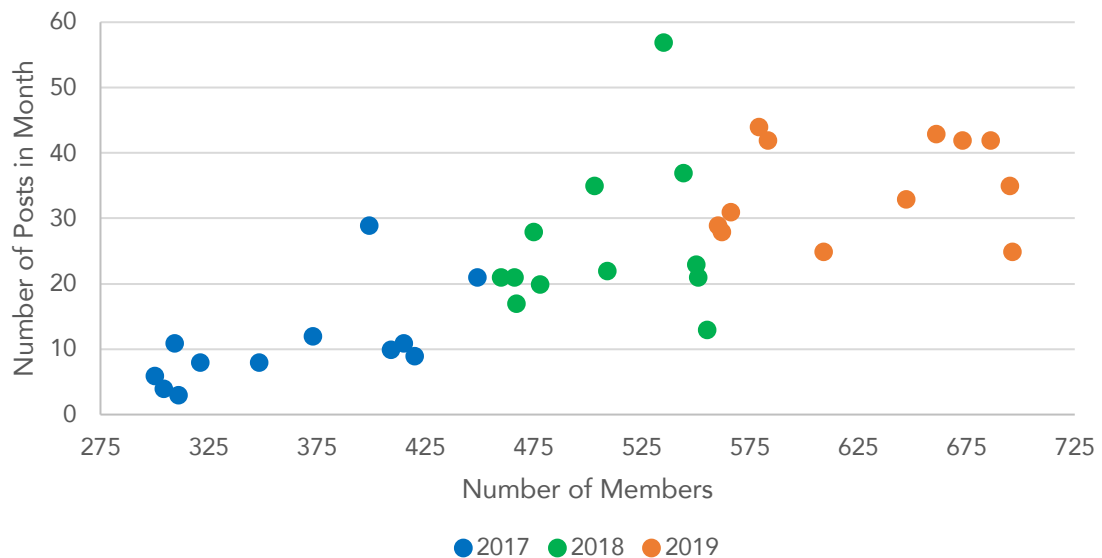
Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

A repeated measures ANOVA was used to test the difference in the number of posts each month per year. The dependent variable was tested for normality using the Shapiro Wilks test and two of the three groups failed the assumption of normality. Although the assumption of normality failed, the F-statistic remained robust when sample sizes across groups (number of months per year) were held equal (Bradley, 1980). The

data also met the assumption for Mauchly's test of sphericity ($p > .05$). As such, no modifications were necessary.

The repeated measures ANOVA of posts each month per year showed statistically different numbers of posts across the three years of the study ($F(2,22) = 32.31$, $p < .05$). The year in which posts were made accounts for 9.72% of the variability in the number of posts with a medium effect size ($f = .328$). A Bonferroni post hoc analysis revealed there was a statistically significant difference ($p < .05$) between the number of posts made when comparing 2017 to 2018 ($MD = 15.250$, $p < .05$), and 2017 to 2019 ($MD = 23.917$, $p < .05$). There was no statistically significant difference when comparing 2018 to 2019 ($MD = 5.667$, $p > .05$).

Number of Posts per Month

The minimum number of posts made in a month was three (April 2017), and the maximum was 57 (August 2018). As shown in Table 7, the average number of posts per month was 24.08 ($SD = 13.40$).

A repeated measures ANOVA was used to test the difference in the number of posts each year per month. The dependent variable was tested for and met the assumption of normality using the Shapiro Wilks test ($p > .05$). The data failed the assumption for Mauchly's test of sphericity ($p < .05$), thus, the Greenhouse-Geisser adjustment was used for the test.

The repeated measures ANOVA showed no statistical difference in the number of posts per month ($F(1.98, 3.96) = 2.56$, $p > .05$).

Table 7

Frequencies of Posts by Month in the CAEDL Facebook Group

Month	Year 2017	2018	2019	Total	*M*	*SD*
January	6	21	29	56	18.67	11.68
February	4	21	28	53	17.67	12.34
March	11	17	31	59	19.67	10.26
April	3	28	44	75	25.00	20.66
May	8	20	42	70	23.33	17.24
June	8	35	25	68	22.67	13.65
July	12	22	33	67	22.33	10.50
August	29	57	43	129	43.00	14.00
September	10	37	42	89	29.67	17.21
October	11	23	42	76	25.33	15.63
November	9	21	35	65	21.67	13.01
December	21	13	25	59	19.67	6.11
Total	132	315	419	866	24.08	13.40

Note. Data are from January 1, 2017, to December 31, 2019

Number of Posts per Day

For data observed across the three years, there were a total of 1,095 days. Of those, there were 593 days (54.16%) with no posts and 502 days (45.84%) with at least one post. The most frequent number of posts made per day was one. This accounted for 25.66% ($n = 281$) of days in the study's timeframe. The frequency of posts per day within each year is shown in Table 8. In 2017, there were more days with no posts ($n = 275$, 75.34%) than there were days with posts ($n = 90$, 24.66%). However, both 2018 and 2019 included more days with posts ($n = 188$, 51.51% and $n = 224$, 61.37%, respectively) than days without posts ($n = 177$, 48.49% and $n = 141$, 38.63%, respectively).

Table 8

Frequency of the Number of Posts in CAEDL Facebook Group per Day by Year

Year	Number of posts per day									
	0	1	2	3	4	5	6	7	8	9
2017	275	60	21	6	3	0	0	0	0	0
2018	177	114	48	12	9	3	0	0	0	2
2019	141	107	74	23	12	3	3	2	0	0
Total	593	281	143	41	24	6	3	2	0	2

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

Findings Associated with Objective 3

The third objective of this study was to describe engagement frequency per post (comments, reactions, and shares) of the CAEDL Facebook group from January 1, 2017, to December 31, 2019. Engagement is defined as users commenting and reacting (e.g., clicking some type of emotional response of like, love, and laughter, to name a few) to initial posts within the group's Facebook page or sharing the post to another Facebook group, member, or page.

Comments and Reactions per Post

A majority of posts received at least one comment and at least one reaction ($n = 498$, 57.51%). Posts receiving no comments accounted for 22.75% ($n = 197$) of all posts and 233 posts (29.91%) received no reactions (see Table 9). A total of 7.16% ($n = 62$) of posts received no interaction from other members in the form of comments or reactions.

Table 9

Comparison of the Engagement of Posts in the CAEDL Facebook Group

Comments per post	Reactions[a] per post					
	n = 0		n >1		Total	
	n	*%*	*n*	*%*	*n*	*%*
n = 0	62	7.16	135	15.59	197	22.75
n >1	171	19.75	498	57.51	669	77.25
Total	233	29.91	633	73.09	866	100.00

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.
[a]Reaction = like, love, haha, wow, sad, mad.

Average Number of Comments per Post

A total of 5,057 comments were made on the 866 posts included in this study. The mean number of comments per post was 5.84 (SD = 8.11). The average number of comments per post is summarized by month in Table 10. Figure 9 shows the relationship of the mean comment count per post in each month and year (bars) and with the overall mean comment count per post each month for all years (line). August (M = 7.72, SD = 11.63), June (M = 6.85, SD = 8.96), and November (M = 6.69, SD = 7.82) had more comments per month on average than any other month. Three of the four months with the highest mean of comments per post per month were in 2017. The four months with the highest mean of comments per month were February 2017 (M = 10.75, SD = 11.84), August 2018 (M = 9.49, SD = 14.65), September 2017 (M = 8.90, SD = 10.77), and August 2017 (M = 8.44, SD = 8.17), shown in bold in Table 10.

Table 10

Descriptive Statistics of Comments per Post by Month in the CAEDL Facebook Group

Month	Total *M*	Total *SD*	2017 *M*	2017 *SD*	2018 *M*	2018 *SD*	2019 *M*	2019 *SD*
January	4.45	8.18	5.50	5.65	5.67	10.60	3.34	6.55
February	5.66	6.64	**10.75**	**11.84**	6.05	6.54	4.64	5.70
March	4.19	4.74	5.82	4.71	3.41	4.47	4.03	4.91
April	4.72	5.24	3.67	3.79	3.79	5.14	5.39	5.37
May	5.10	5.02	6.50	4.57	6.45	5.61	4.19	4.71
June	6.85	8.96	6.88	9.45	6.86	10.26	6.84	7.00
July	6.39	10.03	5.83	7.58	5.23	7.32	7.36	12.27
August	7.72	11.63	5.62	6.90	**9.49**	**14.65**	6.79	9.29
September	6.21	7.91	**8.90**	**10.77**	3.76	4.20	7.74	9.15
October	5.28	7.08	4.73	4.36	4.35	5.41	5.93	8.38
November	6.69	7.82	**8.44**	**8.17**	5.19	4.39	7.14	9.26
December	4.59	6.16	6.05	7.51	4.23	4.19	3.56	5.74
Total	5.84	8.11	6.33	7.16	5.83	8.85	5.69	7.81

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

Figure 9

Average Number of Comments per Post by Month in the CAEDL Facebook Group
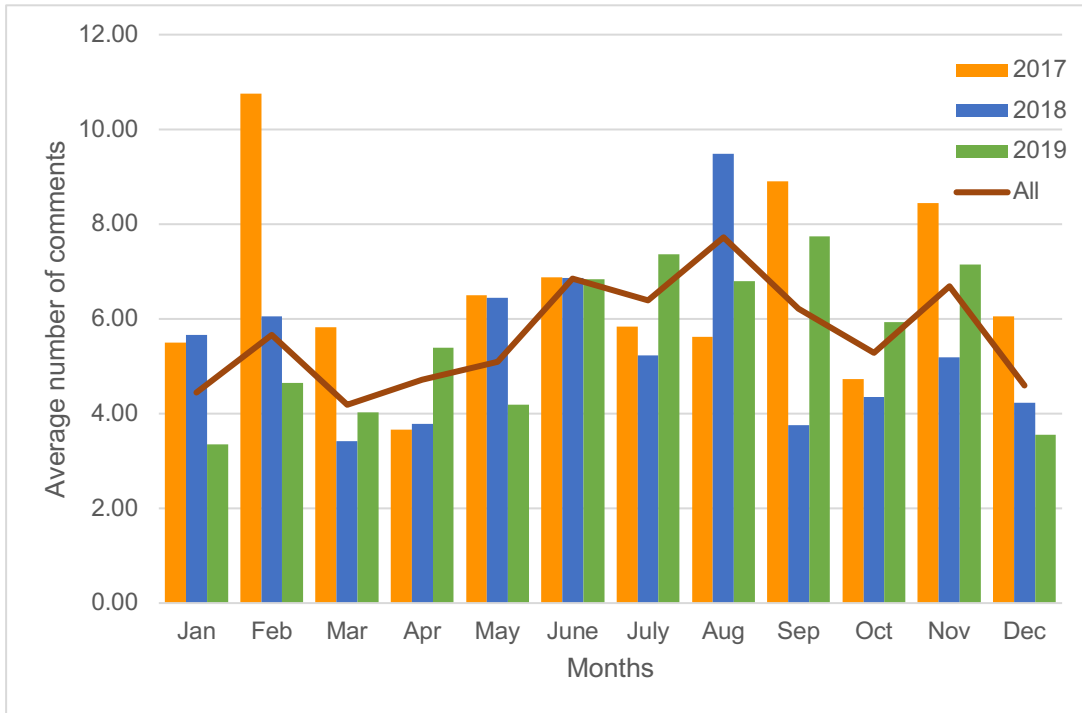
Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

The number of comments per post ranged from 0 to 100. The breakdown of frequencies is shown in Table 11. The most frequent number of comments per post was two (*n* = 93), and the most comments on a single post were 100. Just over five percent of posts (*n* = 45, 5.20%) received in excess of 20 comments.

Table 11

Frequency of Comments per Post in the CAEDL Facebook Group

	Posts with 1-10 comments									
# of comments	1	2	3	4	5	6	7	8	9	10
# of posts	89	93	60	70	49	42	33	28	34	30
	Posts with 11-20 comments									
# of comments	11	12	13	14	15	16	17	18	19	20
# of posts	16	17	14	11	4	12	4	9	3	6
	Posts with 21-30 comments									
# of comments	21	22	23	24	25	26	27	28	29	30
# of posts	6	4	4	2	3	1	5	2	3	3
	Posts with 31-100 comments									
# of comments	31	32	33	37	46	48	50	58	65	100
# of posts	1	1	3	1	1	1	1	1	1	1

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019. Post counts reflect only those increments with actual posts present.

Average Number of Reactions per Post

A total of 5,018 reactions were made on the 866 posts included in this study. The average number of reactions per post is summarized by month in Table 12. Figure 10 shows each month's mean reaction count per post (bars) and the overall mean reaction count per post across all years (line). June and July had the highest average reactions per month than any other month ($M = 9.40$, $SD = 20.20$ and $M = 7.12$, $SD = 8.65$, respectively). Three of the four months with the highest mean of reactions per post per month were in 2017. The four months with the highest mean of reactions per month were July 2017 ($M = 12.00$, $SD = 13.32$), June 2019 ($M = 10.96$, $SD = 27.25$), June 2017 ($M = 10.88$, $SD = 17.79$), and August 2017 ($M = 9.66$, $SD = 17.74$).

Table 12

Mean Reaction per Post in the CAEDL Facebook Group

	Total		2017		2018		2019	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
January	2.96	4.21	4.00	5.22	3.90	5.49	2.07	2.60
February	3.68	5.65	1.50	1.91	3.62	5.86	4.04	5.89
March	4.90	8.43	4.91	5.79	3.88	5.40	5.45	10.48
April	6.71	10.52	0.00	0.00	7.43	9.24	6.70	11.54
May	4.01	6.15	3.63	3.66	3.85	5.93	4.17	6.71
June	9.40	20.20	10.88	17.79	7.94	14.50	10.96	27.25
July	7.12	8.65	12.00	13.32	5.82	6.64	6.21	7.31
August	6.82	11.99	9.66	17.74	6.07	10.48	5.91	8.64
September	5.88	8.17	7.60	9.29	5.86	8.67	5.48	7.58
October	5.70	10.08	2.55	1.92	4.43	7.73	7.21	12.12
November	6.86	14.09	3.00	4.21	7.24	17.07	7.63	13.92
December	3.15	4.86	3.57	5.75	4.46	5.72	2.12	3.31
Total	5.79	10.67	6.29	11.33	5.68	9.75	5.72	11.13

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

Figure 10

Average Number of Reactions per Post by Month in the CAEDL Facebook Group
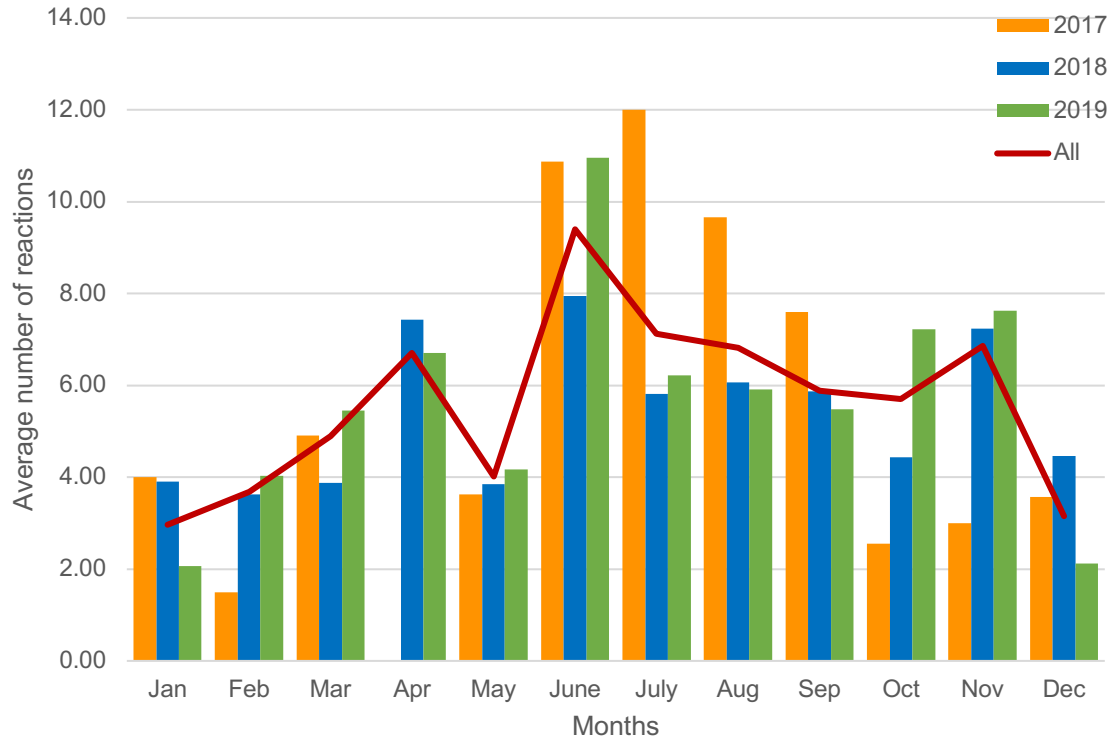
Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

Number of Reactions per Type per Post

The most common reaction to posts was Like. Of the 866 total posts in the study, 72.17% ($n = 625$) received at least one Like. The mean number of reactions per post was 5.79 ($SD = 10.67$), with a total of 5,018 reactions on all 866 posts. There were 233 posts that received no reactions (26.91%) and 136 received one reaction (15.70%). Nearly 99% (98.74%) of posts that received at least one reaction ($n = 633$) received at least one Like. Likes also accounted for 92.25% ($n = 4629$) of all reactions in the CAEDL Facebook

group from January 1, 2017, to December 31, 2019. The frequency of reactions by type

are shown in Table 13.

Table 13

Type of Post Reactions from the CAEDL Facebook Group

Type	Symbol	# of posts	Reaction Count	M	SD
Like		625	4629	5.35	9.41
Love		110	277	0.32	1.52
Haha		16	81	0.09	0.86
Wow		11	20	0.02	0.25
Sad		5	5	0.01	0.08
Mad		4	6	0.01	0.12
Total		633	5018	5.79	10.67

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

When comparing mean comment and reaction counts, comments had a higher

overall mean ($M = 5.84$, $SD = 7.73$) than reactions ($M = 5.79$, $SD = 10.67$). The mean

number of comments per post were also more narrowly distributed based on a lower

standard deviation.

Number of Shares per Post

Only 18 of the 866 (2.08%) posts on the CAEDL Facebook group from January 1,

2017, to December 31, 2019, were shared. Of the 18 shared posts, more than one-half (*n*

= 10, 1.15%) were shared only once. The other eight shared posts were shared twice (*n* =

5, 0.58%), four times ($n = 2$, 0.32%) and six times ($n = 1$, 0.12%). The frequency of posts

by the number of shares is shown in Table 14.

Table 14

Frequency of Shared Posts in CAEDL Facebook Group

Number of shares	# of posts	% of total posts
0	848	97.92
1	10	1.15
2	5	0.58
4	2	0.23
6	1	0.12

Note. Data represent the time frame of the study, January 1, 2017, to
December 31, 2019.

Findings Associated with Objective 4

The fourth objective of this study was to classify the communicative functions of

posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

Specific classifications of communicative functions include Community Building,

Information Sharing, Mobilization, and Promotion. The Mobilization communicative

function includes five subcategories: Factual knowledge, Favor/Request, Opinion/Poll,

Recommendation, and Social Coordination.

The frequency of communicative function posts and the mean comment and

reaction count per post in each of the categories is shown in Table 15. Mobilization posts

were the most prominent ($n = 564$, 65.13%) and Community Building posts were the

least prominent ($n = 20$, 2.31%).

When factoring out the Mobilization subcategories, favor/request posts and

recommendation posts accounted for 82.80% of all Mobilization requests which equates

to 53.93% of all posts in the CAEDL Facebook group from January 1, 2017, to December

31, 2019. The Favor/Request subcategory had the most posts of any Mobilization

subcategory ($n = 261$, 46.28%) and five more posts than the Information Sharing

communicative function ($n = 256$).

Mobilization posts had the highest mean comment count ($M = 6.89$, $SD = 7.73$)

and the lowest mean reaction count ($M = 2.12$, $SD = 3.44$). Community Building had the

highest mean reaction count ($M = 30.40$, $SD = 34.27$).

Table 15

Mean Comment and Reaction per Post by Communicative Function in the CAEDL Facebook Group

Communicative Function	f		% of total	% of Mobilization	Comments M	SD	Reactions M	SD
Community Building	20		2.31		3.90	5.08	30.40	34.27
Information Sharing	256		29.56		3.84	8.85	11.34	11.87
Mobilization	564		65.13		6.89	7.73	2.12	3.44
Factual Knowledge		42	4.85	7.45	4.57	3.44	0.95	1.55
Favor/Request		261	30.14	46.28	6.04	7.85	2.48	3.94
Opinion/Poll		52	6.00	9.22	9.15	8.13	2.87	4.26
Recommendation		206	23.79	36.52	7.92	7.89	1.56	2.15
Social Coordination		3	0.35	0.53	4.00	6.93	13.33	7.37
Promotion	26		3.00		4.12	6.22	11.92	14.10
Total	866				5.84	8.11	5.79	10.67

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

Frequencies of posts receiving no comments and reactions were compared across the communicative functions. All promotional posts received at least one reaction evidenced by their zero counts (see Table 16). Mobilization posts had the lowest percentage of posts without comments ($n = 74$, 13.12%) and the highest percentage of posts without reactions ($n = 207$, 36.70%).

Table 16

Frequency and Percentage of Posts Receiving No Comments or Reactions by Communicative Function in the CAEDL Facebook Group

Communicative Function	Total # of posts	Posts without Comments		Posts without Reactions	
		n	%	*n*	%
Community Building	20	3	15.00	1	5.00
Information Sharing	256	108	42.19	25	9.77
Mobilization	564	74	13.12	207	36.70
Promotion	26	12	46.15	0	0

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

Three of the four communicative functions had a higher percentage of posts with reactions than comments. However, Mobilization posts had a higher percentage of posts with comments (86.88%) than posts with reactions (63.30%). This relationship is displayed in Figure 11.

Figure 11

Relationship of Percentage of Posts with Comments and Reactions by Communicative
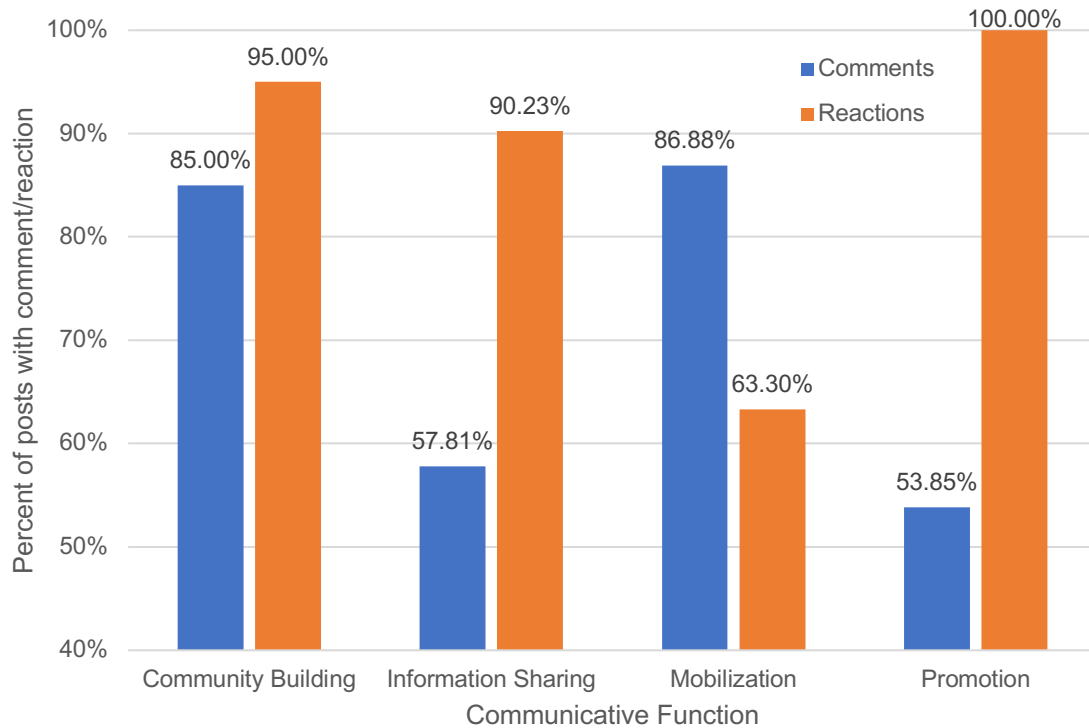
Function in the CAEDL Facebook Group

Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.

Findings Associated with Objective 5

The fifth objective of this study was to classify the SBAE teacher roles identified

in CAEDL Facebook group posts from January 1, 2017, to December 31, 2019.

Teachers' roles are defined as Department Management, Facilities/Equipment, FFA,

Instruction, SAE, and Non-Specific/Other.

Instruction (38.91%) and FFA (20.32%) accounted for more than one-half of the

posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019. The

Non-Specific/Other category, comprised of 188 posts, accounted for 21.71% of all posts.

The mean comment and reaction counts per post by SBAE teacher role are shown in

Table 17. Mean comments per SBAE teacher role post varied from 5.27 to 6.55, for a

mean difference of 1.28 comments per post. The mean reactions per post in the SBAE

teacher role categories had a greater mean difference than comments ($MD = \pm\ 7.82$) with

a range from 1.99 to 9.81 reactions per post.

Table 17

Descriptive Statistics of the SBAE Teacher Roles Identified in the CAEDL Facebook

Group

			Comments		Reactions	
SBAE Teacher Roles	*n*	*%*	*M*	*SD*	*M*	*SD*
Department Management	51	5.89	6.47	6.51	4.18	7.30
Facilities/Equipment	71	8.20	6.55	6.75	1.99	5.02
FFA	176	20.32	5.27	6.00	3.51	6.90
Instruction	337	38.91	6.01	9.44	6.19	9.54
SAE	43	4.97	6.49	7.97	2.67	3.23
Non-Specific/Other	188	21.71	5.47	8.18	9.81	16.21
Grand Total	866		5.84	8.11	5.79	10.67

Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

As shown in Objective 3, 197 posts received no comments and 233 posts received

no reactions. The Non-Specific/Other category had the highest percentage of posts

without comments ($n = 50$, 26.60%). The percentage of posts without comments was

lower than the percentage of posts without reactions for the Department Management,

Facilities/Equipment, FFA, and SAE teacher role categories. Nearly one-half ($n = 33$,

46.48%) of the Facilities/Equipment posts received no reactions. The number of SBAE

teacher role posts without comments and reactions are shown in Table 18.

Table 18

Frequency and Percentage of Posts Receiving No Comments or Reactions by SBAE

Teacher Role in the CAEDL Facebook Group

SBAE Teacher Role	Total # of posts	Posts without Comments		Posts without Reactions	
		n	%	*n*	%
Department Management	51	6	11.76	15	29.41
Facilities/Equipment	71	14	19.72	33	46.48
FFA	176	36	20.45	71	40.34
Instruction	337	82	24.33	65	19.29
SAE	43	9	20.93	13	30.23
Non-Specific/Other	188	50	26.60	36	19.15

Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.

The Instruction and Non-Specific/Other SBAE Teacher role categories were the only categories that had more posts with reactions than comments. All other categories had more posts with comments than reactions as shown in Figure 12. Additionally, Facilities/Equipment posts had the greatest variation in percentage of posts with comments and reactions (difference = ± 26.76%) and Instruction had the least variation (difference = ± 5.04).

Figure 12

Relationship of Percentage of Posts with Comments and Reactions by SBAE Teacher

Role in the CAEDL Facebook Group
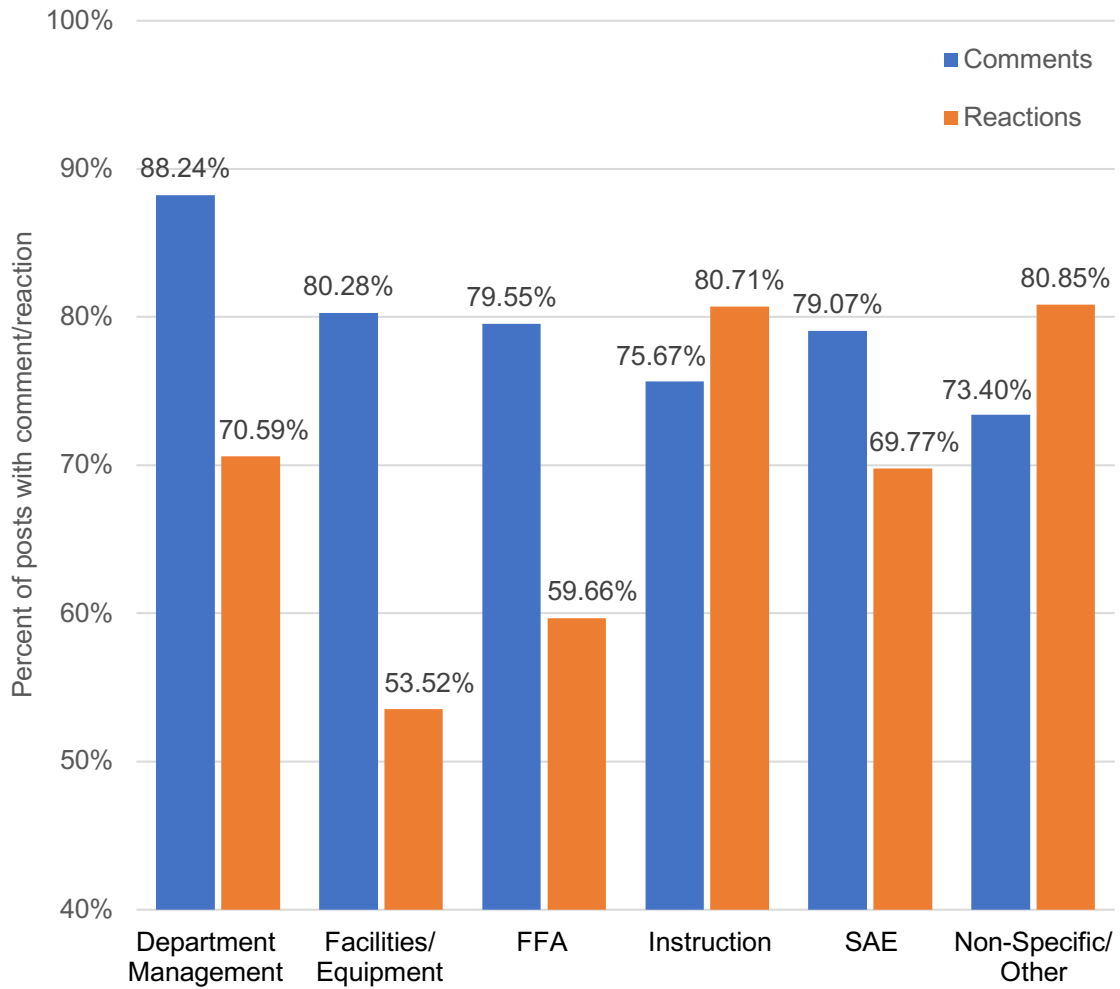
Note. Data represent the time frame of the study, January 1, 2017, to December 31, 2019.

SBAE Teacher Roles Distributed Across Months

Table 19 and Figure 13 show the distribution of posts identified by SBAE teacher

role across the months of the year. Instruction posts were most frequently posted in

August ($n = 70$). August had more than twice the number of Instruction posts than 10 other months, September excluded ($n = 39$). There were also three times more Instruction posts in the month of August than the number of posts in six other months (January, February, April, May, June, November, and December). FFA posts rose to 30 in April. This frequency is 11 more than the month with the next greatest number of FFA posts (October, $n = 19$) and at least twice as many posts as six other months (February, March, May, June, July, and November).

There were almost twice as many Non-Specific/Other posts in June ($n = 38$) than the month with the next greatest number of Non-Specific/Other posts (July, $n = 20$). The number of posts per month in the Department Management, Facilities/Equipment, and SAE SBAE teacher roles more closely matched the mean number of posts for each subcategory as evidenced by their lower standard deviation scores.

Table 19

Frequency of posts identified by SBAE teacher role in the CAEDL Facebook Group

Month	Department Management	Facilities/ Equipment	FFA	Instruction	SAE	Non-Specific/Other
January	1	6	18	18	4	9
February	5	5	11	18	3	11
March	2	4	9	29	4	11
April	2	1	30	23	1	18
May	7	7	14	23	3	16
June	0	8	3	10	9	38
July	2	2	9	29	5	20
August	8	9	17	70	6	19
September	7	10	16	39	4	13
October	5	6	19	32	2	12
November	5	7	13	24	1	15
December	7	6	17	22	1	6
Total	51	71	176	337	43	188
M	4.636	5.917	14.667	28.083	3.583	15.667
SD	2.501	2.644	6.706	15.163	2.353	8.184

Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.

Figure 13

Comparison of Number of Posts by SBAE Teacher Role by Month in the CAEDL Facebook Group
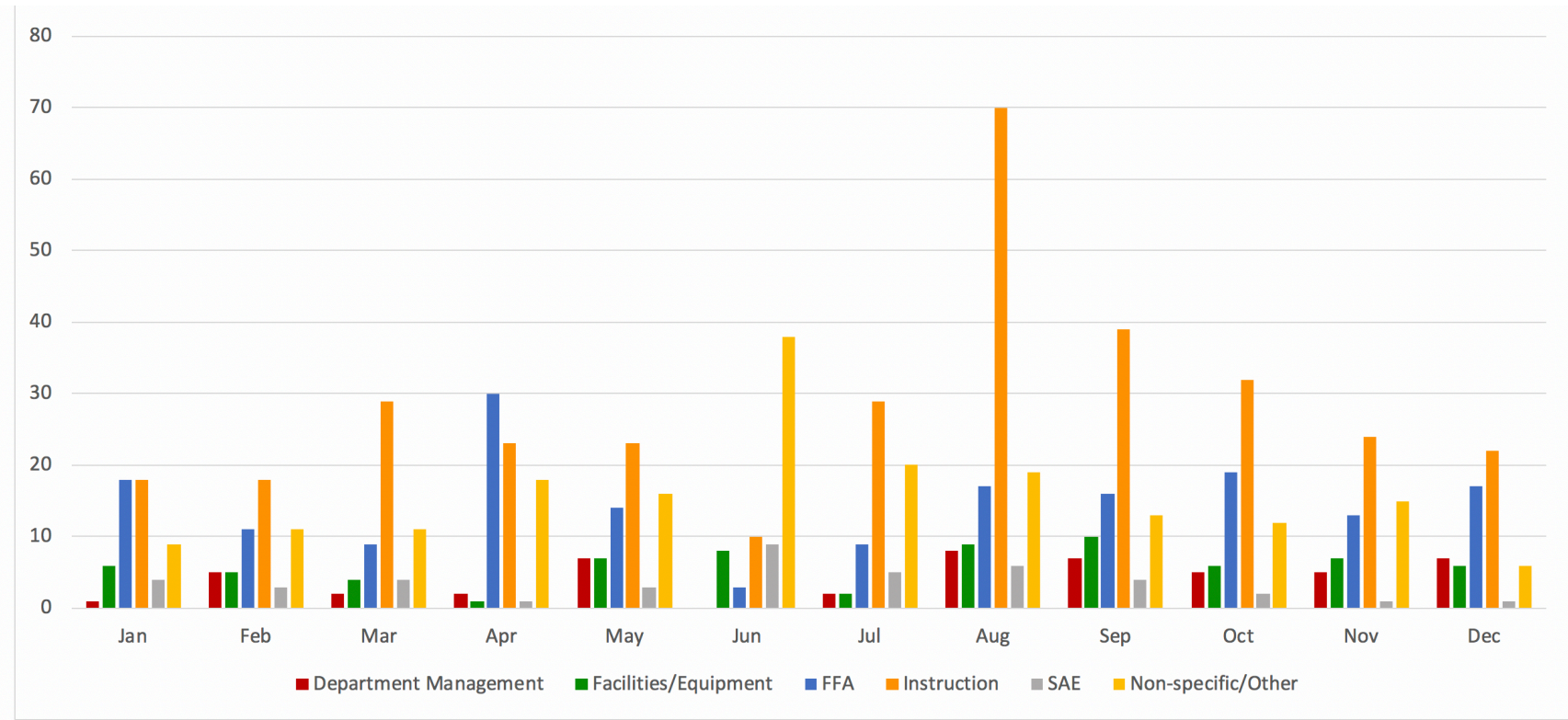
Findings Associated with Objective 6

The sixth objective of this study was to examine relationships among frequencies of posts in each of the identified SBAE teacher roles across communicative functions.

Community Building posts ($n = 20$) were distributed across three of the six SBAE teacher role categories, the most frequent ($n = 17$) in the Non-Specific/Other category (see Table 20). All other communicative function categories had posts that were distributed across all six SBAE teacher role categories. The largest portion of Information Sharing posts ($n = 256$) were in the Instruction category ($n = 114$, 13.16% of total posts). Mobilization posts ($n = 564$) were distributed across the SBAE teacher roles with counts ranging from 35 (4.04% of total posts) to 221 (25.52% of total posts). All SBAE teacher roles/Mobilization posts accounted for at least 4.04% of the total post count. Promotion posts had the second-lowest frequency overall but were still distributed across all six SBAE teacher role categories, with Non-Specific/Other being the most frequent SBAE category in the Promotion communicative function ($n = 12$, 1.39%).

The cross categories are shown in Table 20 and Figure 14 with the most prominent categories shown in bold in Table 20. Mobilization posts in the Instruction category accounted for 25.52% of all posts ($n = 221$), more than 10% more posts than the next category (Mobilization/FFA, $n = 132$, 15.24%). The Information Sharing communicative function had the next greatest number of posts in the Instruction SBAE teacher role category ($n = 114$, 13.16%).

Table 20

Post Frequency of the SBAE Teacher Roles Across Communicative Functions of the

CAEDL Facebook Group

SBAE Teacher Role Category	Communicative Function							
	Community Building		Information Sharing		Mobilization		Promotion	
	n	% of total	*n*	% of total	*n*	% of total	*n*	% of total
Department Management			6	0.69	39	4.50	6	0.69
Facilities/ Equipment			6	0.69	64	7.39	1	0.12
FFA	2	0.23	38	4.39	**132**	**15.24**	4	0.46
Instruction	1	0.12	**114**	**13.16**	**221**	**25.52**	2	0.23
SAE			7	0.81	35	4.04	1	0.12
Other	17	1.96	85	9.82	73	8.43	12	1.39
Total	20		256		564		26	

Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.

Figure 14

Graphic Representation of the Frequency of CAEDL *Facebook Group Roles of an*

Agricultural Educator Across the Communicative Functions of Social Media
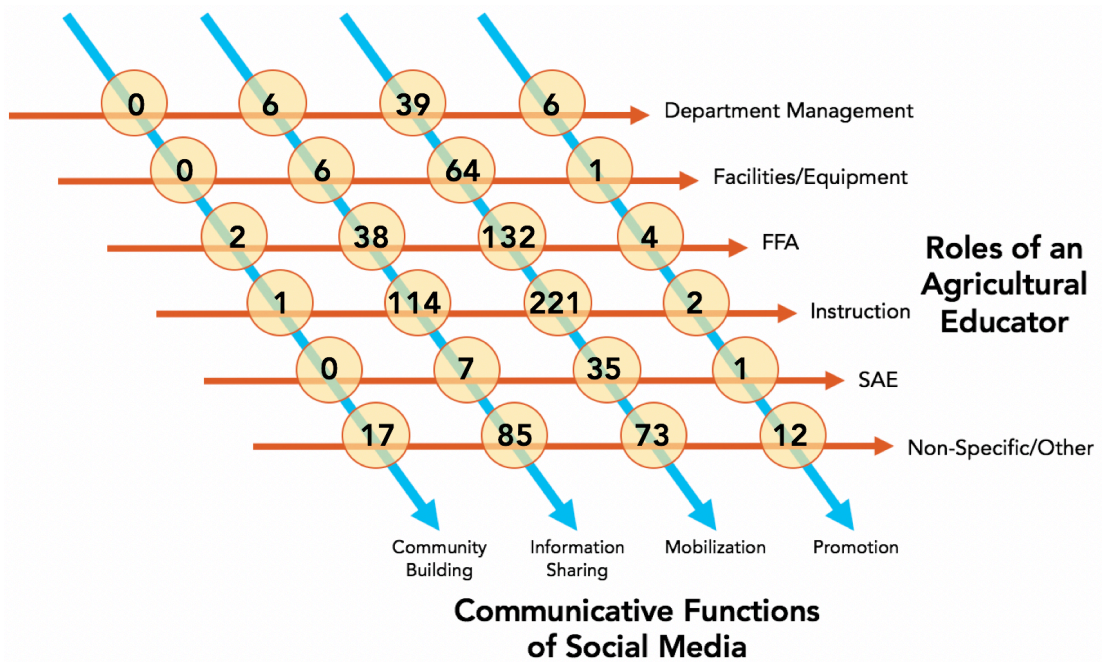
Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.

Findings Associated with Objective 7

The seventh objective of this study was to identify conversations within each

SBAE Teacher role using content subcategories.

Thirteen subcategories were identified in the Department Management SBAE

teacher role category. The frequencies of the Department Management SBAE teacher

roles posts by communicative function are shown in Table 21. Fundraisers had the

greatest frequency of posts ($n = 10$) in the Department Management SBAE teacher role

and were split among 60% Promotion, and 40% of posts seeking recommendations from

other group members. Posts in the combined subcategories of grants and funding

accounted for 13.73% ($n = 7$) of the Department Management posts and were all

considered in the Mobilization communicative function.

Table 21

Frequency of Department Management SBAE Teacher Role Post Subcategories by

Communicative Function

	Number of Posts					
Department Management Subcategory	Total	FK	FR	IS	OP	P	R
AET Record Books	1	1					
AET Scanners	1						1
Booster Clubs/Parent Groups	2		1				1
Class Scheduling	8		2	1	2		3
Funding	4	2	1				1
Fundraisers	10					6	4
Grants (AIG, CTEIG, Writing, Managing)	3		2				1
Other	7		2	2			3
Parents/Stakeholders	7		2	2			3
Recruitment	1		1				
Roster	3	1	1	1			
Student Accounts	1				1		
Student Contracts	3		3				
Total	51	4	15	6	3	6	17

Note. Communicative Functions are abbreviated for space consideration; Factual
Knowledge (FK), Favor/Request (FR), Information Sharing (IS), Opinion/Poll (OP),
Promotion (P), Recommendation (R).

Nine subcategories were identified in the Facilities/Equipment SBAE teacher role

category. The frequencies of the SBAE teacher roles posts by communicative function

are shown in Table 22. Learning laboratory areas, such as greenhouses and school farms,

accounted for 54.93% of the Facilities/Equipment SBAE teacher role category. Among

all Facilities/Equipment categories, Greenhouse/OH/Floral had the highest frequency of

posts, which included Mobilization posts ($n = 20$), and Information Sharing posts ($n = 1$).

Table 22

Frequency of Facilities/Equipment SBAE Teacher Role Post Subcategories by

Communicative Function

Facilities/Equipment Subcategory	Number of Posts					
	Total	FR	IS	OP	P	R
AET Scanners	3			1		2
Ag Mechanics Shop	1					1
Ag Truck/Department Vehicles	4	1		1		2
Classroom Supplies/Furniture	11			1		10
Greenhouse/OH/Floral (including pots and floral equipment)	21	5	1	3		12
Livestock owned by the school	2				1	1
School Farm	18	5		2		11
Storage	2	1	1			
Other	9	1	4			4
Total	71	13	6	8	1	43

Note. Communicative Functions are abbreviated for space consideration; Favor/Request (FR), Information Sharing (IS), Opinion/Poll (OP), Promotion (P), Recommendation (R).

Posts in the FFA SBAE teacher role category were sub-coded into 18 categories listed in Table 23. The greatest frequency of posts in this teacher role category was conferences ($n = 72$). These posts were distributed across seven communicative functions, with the most frequent in favor/request ($n = 21$) and Information Sharing ($n = 20$). During the span of this study, members of the CAEDL also posted 33 times about career development and leadership development events and 25 times about managing the FFA chapter, including FFA chapter meetings/activities ($n = 11$) and officer teams ($n = 14$).

Table 23

Frequency of FFA SBAE Teacher Role Post Subcategories by Communicative Function

FFA Subcategory	Number of Posts							
	Total	CB	FK	FR	IS	OP	P	R
Banquet/Awards Ceremonies	6		1	2	1			2
Career Development Events	27		5	12	3		2	5
Chapter Meetings/Activities	11	1		3		1		6
Conferences	72	1	13	21	20	4	1	12
FFA Degrees (Requirements/Applications)	4		2	2				
FFA Jackets	3			2	1			
Field Day Specific (Fresno, Chico, Cal Poly etc.)	4				1			3
Fundraisers	3			2				1
General Resources	3			1	2			
Leadership Development Events	6			4	1			1
Officer Teams (Applications, Training, Management, etc.)	14			7	1	1		5
Other	10			1	3	1	1	4
Recruitment	3							3
Scholarships & Grants	5				5			
Social Media	1					1		
Student Accounts	1			1				
Student Contracts	1			1				
Student Motivation	2							2
Total	176	2	21	59	38	8	4	44

Note. Communicative Functions are abbreviated for space consideration; Community. Building (CB), Factual Knowledge (FK), Favor/Request (FR), Information Sharing (IS), Opinion/Poll (OP), Promotion (P), Recommendation (R).

Member posts identified within the Instruction category accounted for nearly 40% (38.91%, *n* = 337) of all posts. As shown in Table 24, 10 subcategories were identified among these posts. Members shared 69 posts classified in the general resources/Information Sharing cross-section. These resources included video links,

project ideas, infographics, and other items that were not part of the specific lesson or unit plan subcategories. The most frequent favor/request posts in the Instruction category was for lesson curriculum and/or sub plans ($n = 49$). Members also shared lesson curriculum and/or substitute teacher plans through the Information Sharing communicative function, for a total of 32 posts. Overall, the favor/request and recommendation communicative function accounted for more than half ($n = 200$; 59.35%) of the Instruction posts with Information Sharing representing 33.83% ($n = 114$) of the Instruction SBAE teacher role category.

Table 24

Frequency of Instruction SBAE Teacher Role Post Subcategories by Communicative Function

Instruction Subcategory	Number of Posts							
	Total	CB	FK	FR	IS	OP	P	R
Course Outlines/Pacing Guides	55		2	41	4	2		6
Field Trips	11			2	2	1		6
General Resources	106		1	17	69	4	1	14
Grading/Rubrics	4			1		1		2
Instructional Supplies	21			3	4	1		13
Lesson Curriculum/Sub Plans	102	1	1	49	32	3	1	15
NGSS	3			1	1	1		
Testing/Assessment	16		1	7	2	1		5
Textbook Recommendations	12					1		11
Unit Curriculum	7			4				3
Total	337	1	5	125	114	15	2	75

Note. Communicative Functions are abbreviated for space consideration; Factual Knowledge (FK), Favor/Request (FR), Information Sharing (IS), Opinion/Poll (OP), Promotion (P), Recommendation (R).

Although the Other subcategory in the SAE teacher role category had the most

posts (*n* = 11), members of the CAEDL most often asked for student contracts in the SAE

SBAE teacher role category as shown in Table 25. These requests (*n* = 10) were all sorted

to the favor/request category in the Mobilization communicative function. Overall, SAE

posts (*n* = 43) accounted for only 4.97% of all posts.

Table 25

Frequency of SAE SBAE Teacher Role Post Subcategories by Communicative Function

SAE Subcategory	Number of Posts						
	Total	FK	FR	IS	OP	P	R
AET Record Books	2	2					
Fair	7		1		2	1	3
General Resources	5		2	3			
Ideas	5	1			3		1
Livestock	1			1			
Livestock Camp	1			1			
Proficiencies	1						1
Student Contracts	10		10				
Other	11	1	2	2			6
Total	43	4	15	7	5	1	11

Note. Communicative Functions are abbreviated for space consideration; Factual
Knowledge (FK), Favor/Request (FR), Information Sharing (IS), Opinion/Poll (OP),
Promotion (P), Recommendation (R).

The final teacher role category was the Non-Specific/Other category. Posts in this

category summarized all other duties of the SBAE teacher, but also provided a place for

posts that were *non-specific* to one of the other SBAE teacher roles. The subcategories in

the Non-Specific/Other category are identified in Table 26. Information sharing was the

most frequently used communicative function in the Non-Specific/Other SBAE teacher

role category, including posts about professional development (*n* = 21), the annual

conference of the agriculture teachers' association (*n* = 17), and job opportunities (*n* =
14). Members also used the CAEDL to ask about and share information about credentials
and industry certifications (*n* = 11). The *other* subcategory in the Non-Specific/Other
category included posts about outside resources for teachers that did not fit into any
category.

Table 26

Frequency of Non-Specific/Other SBAE Teacher Role Post Subcategories by

Communicative Function

Non-Specific/Other Subcategory	Number of Posts								
	Total	CB	FK	FR	IS	OP	P	R	SC
CATA General (includes Golden Slate)	6		1	3		1			1
CATA Summer Conference (includes Banquet, workshops, etc.)	32	2		9	17	2	1	1	
Commiserate	3				2	1			
Credentials/Certifications	11	2	2	3	2	1		1	
Funny/Humor	9	6			2		1		
General Resources	5			2	2	1			
Goodwill (Checking on others after disaster)	6	3	1		2				
Job Opportunities	18		1	1	14			2	
Other	53	3	2	12	22	3	4	7	
Personal life/ Work-life balance	1			1					
Professional Development	38	1	1		21	2	6	5	2
Stipends/Salaries	4			2		2			
Vision 2030	2			1	1				
Total	188	17	8	34	85	13	12	16	3

Note. Communicative Functions are abbreviated for space consideration; Factual
Knowledge (FK), Favor/Request (FR), Information Sharing (IS), Opinion/Poll (OP),
Promotion (P), Recommendation (R).

Findings Associated with Objective 8

The final objective of this study was to describe authorship of posts the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

There were 251 unique authors among the 866 posts analyzed, of which, 250 were current members of the group as of January 10, 2020. One author left the group between posting in the group and the date data were collected. Founding members, those who joined in the first month of the group (June 2016) accounted for 115 (46%) of the 250 authors. The 250 authors represent 35.82% of the total membership of the CAEDL Facebook group ($n = 698$). Authors posting only once accounted for 45.42% ($n = 114$). Thirty members, including the group moderator, accounted for more than half ($n = 437$, 50.46%) of posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

The authors posted an average of 3.45 posts ($SD = 5.32$) during the time frame of this study. Authors received an average of 20 comments ($SD = 31.45$) across all posts, with the maximum number of comments per author being 202. Eighteen authors received no comments on any of their posts. The reactions per author ranged from 0 to 605, with 43 authors receiving no reactions on their posts. One author received 605 reactions to their posts. On average, authors received 19.99 ($SD = 56.23$) reactions to their posts. Five authors received no comments and no reactions to their posts.

Analysis of covariance was used to test the effect of year on the number of unique authors by month when controlling for the number of members in the group. The observations were independent, normally distributed (skewness $< \pm |1.96|$ and kurtosis $< \pm |1.96|$; (Kim, 2013; S. G. West et al., 1995), had equal variances (Levene's statistic, $p >$

82

.05), and the dependent variable (number of unique authors) and covariate (total membership) had a linear relationship as shown in Figure 15. All groups had a similar positive regression coefficient (2017, $B = .064$; 2018, $B = .059$; 2019, $B = .024$) and there was no interaction between the dependent variable and the covariate ($p > .05$). Results of the ANCOVA suggest the difference in the number of unique authors per month across years was not statistically significant when controlling for the number of members in the group ($F_{(2,32)} = .80$, $p > .05$).

Figure 15

Relationship of Membership Over Time to Active Authorship in the CAEDL Facebook Group
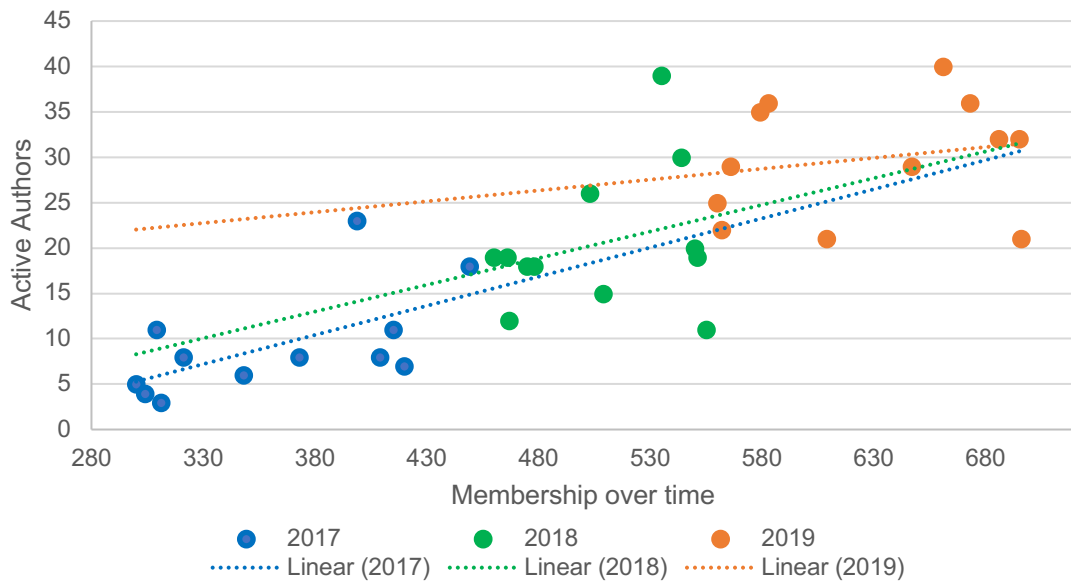
Members who joined in the first month of the group (June 2016) authored 508 posts (58.66%) in the CAEDL Facebook group from January 1, 2017, to December 31, 2019. These posts were authored by 115 authors, for an average of 4.42 posts per author.

Furthermore, during 29 of the 36 months analyzed in this study, founding members posted more than non-founding members as shown in Figure 16. The range of founding members posting each month varied from 3 to 24, with an average of 11.28 ($SD = 4.75$) founding members posting each month. Non-founding member authorship ranged from 0 to 23, with an average of 8.61 ($SD = 7.00$) posting each month.

Figure 16

Difference in Number of Founding Authors and All Other Authors by Month in the CAEDL
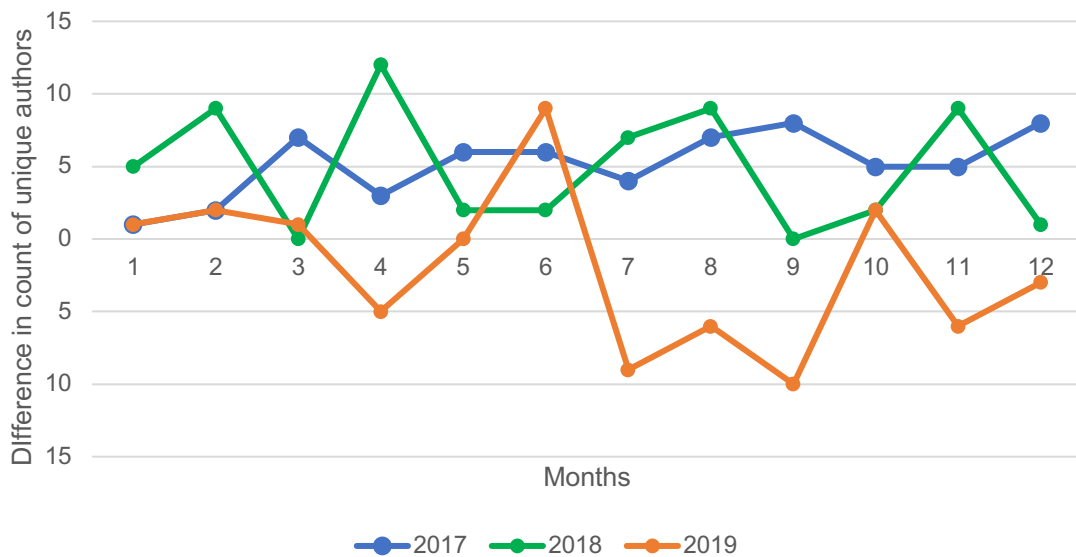
Note. A number above the center line represents the difference in authors in favor of founding authors, whereas the number below the center line represents the difference in authors in favor of non-founding authors. A value of zero indicates the same number of founding and non-founding authors posted in that month.

Because posts before January 1, 2017, were not included in data collection, there is no way to assess the time between when all members join the group and make their

first post. However, those who joined after January 1, 2017, waited for an average of

13.60 months (*SD* = 8.43) before making their first post.

Authorship by Communicative Function

More than half of the authors posted a favor/request (*n* = 135, 53.78%). Nearly

one-half (*n* = 116, 46.22%) authored recommendation posts and in excess of one-third (*n*

= 86, 34.26%) authored Information Sharing posts. Authorship by communicative

function is shown in Table 27

Table 27

Authorship of CAEDL *Facebook Group posts by Communicative Function*

Communicative Function	# of posts	# of authors[a]	# of posts per author	
			M	*SD*
Community Building	20	16	1.25	0.58
Information Sharing	256	86	2.98	5.13
Mobilization				
Factual Knowledge	42	27	1.56	0.97
Favor/Request	261	135	1.93	1.57
Opinion/Poll	52	39	1.33	0.81
Recommendation	206	116	1.78	1.52
Social Coordination	3	1	3[b]	-
Promotion	26	18	1.44	1.20

Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.
[a]Total number of authors is 251; [b]all three Social Coordination posts were made by the same author.

Authorship by SBAE Teacher Role Category

Each SBAE teacher role category had a minimum of 30 authors contribute to the

category. Among authors who posted in the time frame of the study, 141 (56.18%)

different authors contributed to the Instruction SBAE teacher role category and

contributed an average of 2.39 (*SD* = 2.99) posts per person. The total authorship by

SBAE teacher role is shown in Table 28.

Table 28

Authorship of CAEDL *Facebook Group posts by SBAE Teacher Role*

SBAE Teacher Role	# of posts	# of authors[a]	# of posts	
			M	*SD*
Department Management	51	38	1.34	0.91
Facilities/Equipment	71	54	1.31	0.75
FFA	176	89	1.98	1.89
Instruction	337	141	2.39	2.99
SAE	43	30	1.43	0.82
Non-Specific/Other	188	92	2.04	2.86

Note. Data represent time frame of the study, January 1, 2017, to December 31, 2019.
[a]Total number of authors is 251.

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Chapter V presents conclusions, implications, and recommendations associated with the purpose and objectives of this research.

Purpose and Objectives

The purpose of this study was to analyze the naturalistic posts in the CAEDL Facebook Group to classify and further analyze conversations of California SBAE teachers.

The following objectives framed this study:

1. Describe the selected characteristics (age and gender) of members of the CAEDL Facebook group.

2. Describe members' use of the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

3. Describe engagement per post (comments, reactions, and shares) of the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

4. Classify the communicative functions of posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

5. Classify the SBAE teacher roles identified in CAEDL Facebook group posts from January 1, 2017, to December 31, 2019.

6. Examine relationships among frequencies of posts in each of the identified SBAE teacher roles across communicative functions in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

7. Identify conversations within each SBAE Teacher role using content subcategories of posts classified in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

8. Describe authorship of posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

Conclusions and Implications Associated with Objective 1

The first objective of this study was to describe the membership of the CAEDL Facebook group. Based on the findings of this study, I conclude membership in the CAEDL Facebook group increases most during the summer months. This increase likely results from the influx of new teachers entering the profession at this time of year and promotion of the group during the annual CATA (California Agriculture Teachers Association) Conference. Membership in the CAEDL Facebook group increased at an average rate of 10 people per month for the duration of the analysis. The measurement of membership growth is limited in this study, however, because only the join dates of current members were available. A better analysis of membership growth could be calculated if the number of members who left the group could have been attained.

The typical CAEDL Facebook group member is female, and 25 to 44 years old. To be precise, more than one-third (36.46%) of members of the CAEDL were females

between the ages of 25 and 34, and another 16% were 35- to 44-year-old females. With less than 30% of the group comprised of males (28.53%, n =198), could this mean more females see value in the Facebook group? Additionally, according to the *Teach Ag California* webpage, 58% of SBAE teachers in California are female and 42% are male. What does this mean for the males in the profession, and where do they turn to ask questions and share resources?

It is unclear how many of the original members who joined in June of 2016 left the group over time, but at least one-third ($n = 255$, 36.53%) of the current membership is made up of individuals who joined in the first month. Although their posting and reaction activity prior to January 1, 2017, is unknown, more than half (54.90%, $n = 140$) of the original members chose not to post during the time frame of the study. Even so, these *lurkers*, members who do not actively post in the group, have remained in the group, which suggests they valued the group when it was first started as a bottom-up initiative (Lantz-Andersson et al., 2018) and continue to see value from the group as it grows. Could these members be active in a different role? Does their inactivity in posting mean they do not feel the need to start conversations but are monitoring the group to possibly help others?

In the literature, founding members of such groups are referred to as *elders* and can play a key role in group participation and supporting others in the community (Bishop, 2007). Elders in groups like the CAEDL share tacit knowledge as a form of informal mentorship through their comments and informational posts in the group (Booth, 2012). This connection to elders is made possible through the ability of the CAEDL to connect members in the global village that exists because of the media (Strate,

2004; Velázquez et al., 2018; R. L. West & Turner, 2018). Could elders influence be instrumental in reducing teacher turnover by connecting with beginning SBAE teachers on common interests and encouraging them through the external network (Ingersoll & Smith, 2004; T. M. Smith & Ingersoll, 2004)?

Conclusions and Implications Associated with Objective 2

The second objective of this study was to describe the use of the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

Based on the findings of this study, it can be concluded the number of posts in the CAEDL Facebook group increases as membership increases. The number of posts per year increased each year from 2017 to 2019. The increase in posts was statistically significant from 2017 to 2018, but there was not a statistically significant increase from 2018 to 2019. It can be concluded further, the number of posts made by members in the CAEDL is relative to the number of members in the group. The ANCOVA found no statistically significant difference in the number of posts made when controlling for the number of members in the group. This finding suggests the number of posts made in the group increases as the number of members in the group also increases. The theory of Media Ecology tells us as media evolves, so does interpersonal communication because of the increased access to the technology (Strate, 2004; Velázquez et al., 2018). Moreover, members consistently post in the CAEDL throughout the calendar year with no statistically significant difference in the number of posts made from one month to the next. Could this imply the CAEDL Facebook group is a growing community that evolves with the technology and demands of society?

Conclusions and Implications Associated with Objective 3

The third objective of this study was to describe engagement frequency per post (comments and reactions) of the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

Based on the findings of this study, it can be concluded the CAEDL Facebook group is a successful platform for meaningful and engaging interaction among members. The CAEDL Facebook group benefits its members and is successful as an online community because of the willingness of members to engage with posts through comments (Arguello et al., 2006; Lampe et al., 2014). Zell and Moeller (2018) surmised comments require more effort and more comments could be meaningful indicators of genuine care and interest. Although the difference between the two engagement indicators is small ($n = 39$; $MD = 0.15$), the members engaged more with comments ($n = 5,057$) than reactions ($n = 5,018$) for the duration of the analysis.

The most common reaction added to posts by members of the CAEDL Facebook group is Likes. Nearly 99% of reactions recorded on posts from January 1, 2017, to December 31, 2019, were Likes. These reactions create a positive atmosphere within the CAEDL ecosystem (Velázquez et al., 2018; R. L. West & Turner, 2018) for members as a greater number of Likes can also affirm positivity and importance of a post (Zell & Moeller, 2018). Does this increase in reactions on mobilization posts imply the mobilization requests are being answered, or are more teachers identifying the same need with a follow in the comments?

It can be also be concluded increased membership does not equate to increased engagement on posts. Members in the CAEDL posted fewer comments per post in 2019

than in 2017 and 2018. This finding is consistent with Ayres' (n.d.) conclusion that posts on Facebook pages generate fewer comments per post as followership increases. Could this mean the larger a group gets, the less personal and connected its members feel within the group? Does the increase in members overload the CAEDL ecosystem and force it into a reversal where it becomes ineffective (R. L. West & Turner, 2018)?

Conclusions and Implications Associated with Objective 4

The fourth objective of this study was to classify the communicative functions of posts in the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

Based on the findings of this study, I conclude members of the CAEDL use the network of members in the Facebook group to gain answers to questions to cover the variation in demands of the profession (Myers et al., 2005). In response, the network provides answers. It can be further concluded that members in the CAEDL comment on posts to provide support to other members' Mobilization requests (Arguello et al., 2006; Lampe et al., 2014). More than two-thirds of posts analyzed in this study were Mobilization posts and received more comments per post than any other communicative function. The Mobilization category was also the only communicative function with more comments per post than reactions per post. This finding is consistent with Lampe et al. (2014) who found significantly more comments and fewer likes on Mobilization posts than on non-Mobilization posts. This also implies the success of the CAEDL Facebook group through members' interactions (Arguello et al., 2006; Lampe et al., 2014) and addresses McLuhan's interest in how media socially impacts the ecosystem (McLuhan, 1964; R. L. West & Turner, 2018) by understanding how communication technologies control the direction of information (Velázquez et al., 2018).

Conclusions and Implications Associated with Objective 5

The fifth objective of this study was to classify the SBAE teacher roles identified in the CAEDL Facebook group posts from January 1, 2017, to December 31, 2019.

Classroom instruction is the key concern for members of the CAEDL Facebook group. Posts about instruction accounted for nearly 40% of all posts in CAEDL Facebook group from January 1, 2017, to December 31, 2019. Members of the CAEDL Facebook group posted about instruction most in the months of August, September, and October. Coincidentally, lack preparation time at the beginning of the school year was found to be a challenge for beginning teachers (Myers et al., 2005) and mid-career teachers (S. W. Smalley & Smith, 2017). The increase in resources being shared during the months of August to October suggests teachers are trying to save time and not reinventing the wheel when it comes to creating instructional resources.

These findings imply frequencies of posts increase concert with events occurring throughout the calendar year. Spikes of posts associated with FFA increased in April which coincides with the California FFA State Convention. Posts focusing on instruction increased during the months of August, September, and October as schools began a new academic year. In June, posts categorized as Non-Specific/Other increased as teachers focused on the annual teachers' conference. This conclusion aligns with Batorski and Grzywińska (2018) who stated an increase in the number of posts is often dependent on events happening within the public sphere. Members of the CAEDL Facebook group are using the social network and community in the Facebook group to navigate key events within the school year. This finding also suggests the members' choice to limit membership to CATA members supports the sharing of state-specific content in the

spikes for FFA and Non-specific/other posts. Could this mean other state's teacher Facebook groups would have similar spikes throughout the year for events occurring throughout the year within their own *global village*?

Conclusions and Implications Associated with Objective 6

Objective 6 examined relationships among frequencies of posts in each of the identified SBAE teacher roles across communicative functions.

Based on the findings of the study, I conclude the purpose of the CAEDL Facebook group to "share resources, collaborate and connect with those in California" (California Ag Ed Discussion Lab, n.d., para. 1) is being met. Members engage the CAEDL Facebook group to request instructional resources from other members. Not only are CAEDL Facebook group members asking for resources, (Mobilization/Instruction), they are also providing resources to other members (Information Sharing/Instruction). This ability for social media to connect teachers from throughout the state creates a form of McLuhan's global village where the Facebook group can break down geographical barriers of professional development (Ingersoll & Smith, 2003; R. L. West & Turner, 2018). This finding also supports previous research about how teachers use social media: (a) collaboration and idea generation, (b) connecting and supporting each other, (c) and seeking advice (Hart & Steinbrecher, 2011; Kelly & Antonio, 2016). Mobilization posts were the most frequent communicative function used for all SBAE teacher roles areas and the most frequent combination of communicative function and SBAE teacher role was Instruction/Mobilization. In addition, 114 posts shared instructional information. What does this mean for the other areas of SBAE in California? Does this imply that SAE is not as important to teachers, or are they gaining SAE resources elsewhere?

Conclusions and Implications Associated with Objective 7

The seventh objective of this study was to identify conversations within each SBAE Teacher role using content subcategories.

The CAEDL offers a forum for teachers to share resources and seek information about a multitude of topics. The findings of this study indicate the CAEDL is much more than an idea share for California SBAE teachers. Rather, this analysis of posts shows the group allows for the interaction of members to solve issues and offer advice when asked about topics ranging from coaching career development events to planning lesson curriculum. The group also provides possible solutions to major problems facing beginning teachers (Boone & Boone, 2007a; Myers et al., 2005; Talbert et al., 1994), especially in providing curriculum and lesson plan resources. The group even provides opportunities to attain answers to time-sensitive questions and requests, especially when away at FFA and professional development conferences.

Conclusions and Implications Associated with Objective 8

The final objective of this study was to describe authorship of posts the CAEDL Facebook group from January 1, 2017, to December 31, 2019.

A small number of members account for the majority of posts in the CAEDL Facebook group. Nearly 64% of the members in the CAEDL Facebook group did not author a single post during the time frame of this study. Furthermore, 114 (45.42%) of those who authored posts authored only one post during the time frame of the study. This pattern of minority participation is similar to other studies about participation in social network communities (Batorski & Grzywińska, 2018; Rensfeldt et al., 2018). Does this

communication technology still provide value to members who are not posting in the group?

Founding members provide a foundation of content and continually add value to the group by remaining active in the CAEDL Facebook group. This conclusion supports previous research from Ranieri et al. (2012) who found members who were in the group for a longer period of time were more active in the group. Almost half of the members (*n* = 115; 46%) who posted during the time frame of this study joined the CAEDL Facebook group in June of 2016. These members accounted for 58.66% (*n* = 508) of posts authored in the CAEDL Facebook group from January 1, 2017, to December 31, 2019. Bishop (2007) referred to these members as *elders* and credits them for regularly participating in a group and supporting other members. Why are so few new members posting in the group? Are these members first observing in the group to understand the climate of other conversations? Does this imply new members need to first adapt to the community?

Recommendations for Practice

Further analysis of post comments, including author and content, could provide a clearer picture of how members are active in the community and see if members requesting similar resources by commenting on or following original posts (Rensfeldt et al., 2018). Furthermore, identifying authors of comments would allow for the analysis of the social networks created through comments and reactions to better understand how members are connected within the social ecosystem. Understanding better how members interact in the groups through post and comment threads could identify new group moderators and mentors for new teachers. This could also provide evidence of how mentors interact with beginning teachers as called for by Tummons et al. (2016).

Furthermore, identifying member locations could provide evidence for the benefit of social media breaking down the geographical barrier to professional development (T. M. Smith & Ingersoll, 2004; R. L. West & Turner, 2018).

The profession should encourage the use of closed Facebook groups like the CAEDL to promote collaboration and support for all teachers. Facebook groups serve a purpose in connecting members to resources and like-minded professionals (Kelly & Antonio, 2016; Zell & Moeller, 2018). The availability of support and the ability to find mentors in the profession is paramount to the success of a new teacher (Staudt et al., 2013; Talbert et al., 2007). Connecting teachers through online communities limits the feelings of isolation often felt by teachers who have thought about leaving the profession (DeLay & Washburn, 2013; T. M. Smith & Ingersoll, 2004).

Early exposure to the CAEDL for young teachers could fuel teachers' confidence and expose them to a collaborative community from the start, increasing career satisfaction and commitment (DeLay & Washburn, 2013). Additionally, the profession should use SBAE teacher Facebook groups to identify the needs of members during the calendar year and provide support from group elders during time periods when different SBAE teacher roles spike in posts. There is also the potential for the profession to utilize the CAEDL to promote professional development and meet the unique needs of the underrepresented population of mid-career teachers who are part of the second-largest age group (35 to 44 years of age; DeLay & Washburn, 2013).

Recommendations for Future Research

Further research should be done to analyze the engagement of members in Facebook groups. Literature and resources exist to benchmark the responsiveness and

engagement of Facebook pages. However, the dearth of literature about Facebook group analyses, more specifically closed Facebook groups, sheds a light on a need for more research in the area of Facebook group engagement. Without benchmark data for closed Facebook groups, it is difficult to rate the true engagement of the CAEDL Facebook group, and other closed teacher support groups. This recommendation is in support of Zell and Moeller (2018) who called for future research to find ways to measure responsiveness on Facebook. Additionally, Kelly and Antonio (2016) stated with the significant activity of teachers in closed Facebook groups, the need exists to examine the support systems occurring in closed groups.

Members post more requests in the instruction and FFA SBAE teacher roles. Are these areas more mobilized through the CAEDL Facebook group because members need more assistance in these areas or are they seeking new opportunities? If teachers really feel more competent in the FFA component of the three-circle model than other components (Birkenholz & Harbstreit, 1987; Garton & Chung, 1996; Joerger, 2002; Myers et al., 2005), why are there more FFA requests than SAE? Is the lack of SAE posts representative of less weight placed on the SAE component in California? Future research should investigate why members are not inquiring about SAEs or investigate what other resources teachers are utilizing for SAE mentorship and support.

Future research should be done to account for members who were active in the CAEDL Facebook group by commenting and reacting to posts. Although these members do not contribute as post authors their comments and reactions are important to the success of the community (Arguello et al., 2006; Lampe et al., 2014). Additional research to identify lurkers, the members who do not contribute to the group, could show how

consumers of information also gain value from the group, even though they are not actively participating.

Finally, it is recommended this study be replicated using other SBAE teacher groups to identify the important conversations at each state level. The findings from this study are specific to the CAEDL and emphasize the Instruction SBAE teacher role. Would other state SBAE teacher groups yield similar frequencies of communicative functions and SBAE teacher roles? Would other groups, especially those anecdotally known for SAE and/or FFA prominence, emphasize another aspect of the three-circle model? The use of the conceptual framework with other state teacher groups would identify how the SBAE teacher Facebook groups are being used by members. Furthermore, the replication of this study using the national Ag Ed Discussion Lab could provide direction to the administrators of the group to begin promoting more targeted collaboration and mentor/mentee opportunities to teachers with specific mentorship needs, regardless of geography.

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APPENDIX

CODEBOOK FOR CAEDL FACEBOOK GROUP

Codebook for CAEDL Facebook Group

General Directions: Record all data in Excel Spreadsheet. Follow specific instructions for each variable. Record "99" for any information that is unavailable.

Directions for Variables 1-17: Record information based on the California Ag Ed Discussion Lab Facebook group page.

Variable # and Name	Directions Descriptions	Cohen's kappa	Data Type	Method of Recording
1 Post Date	When the message was posted on the organization's page. Record as MM/DD/YY.		Interval	*Recorded by Sociograph
2 Post Time	Record the time the message was posted on the organization's page. Use PST military time (HH:MM).		Interval	*Recorded by Sociograph
3 Text	Record the text content present in the post. If no text is present, Record "999."		Nominal	*Recorded by Sociograph
7 Reactions	Record the total number of reactions (like, love, haha, wow, sad, angry) to the post.		Ratio	*Recorded by Sociograph
8 Likes	Record the number of "likes"		Ratio	Hand coded
9 Loves	Record the number of "loves"		Ratio	Hand coded
10 Haha	Record the number of "hahas"		Ratio	Hand coded
11 Wow	Record the number of "wows"		Ratio	Hand coded
12 Sad	Record the number of "sads"		Ratio	Hand coded
13 Angry	Record the number of "mads"		Ratio	Hand coded
14 Shares	Record the number of shares.		Ratio	*Recorded by Sociograph
15 Comments	Record the number of comments listed.		Ratio	*Recorded by Sociograph

	Content Coding		.	.	

18	Communicative Function	- Community Building
		- Information Sharing
		- Mobilization*
		  o Recommendation
		  o Factual Knowledge
		  o Social Coordination
		  o Favor/Request
		  o Opinion Poll
		- Promotion
		
		*Mobilization posts will be coded as their sub-category
			Nominal	Hand coded	

19	Follow-up	- No email or PM was provided - Provided email address - Asked others users to PM/DM	Nominal	Hand coded	
20	Level of teaching experience identified	0 - not identified 1 - First Year Teacher 2 - Second Year Teacher 3 - three to five years 5 - more than 5 years P - Pre-service (still in college) S - Student Teacher	Nominal	Hand coded	

	Teacher Roles				
22	Primary Area	- Department Management - Facilities/Equipment - Instruction - FFA - SAE - Non-Specific/Other	Nominal	Hand coded	
23	Primary Category	*See color coded sheet	Nominal	Hand coded	
24	Primary Sub Category	*See color coded sheet	Nominal	Hand coded	
26	Notes	Individual coder notes (not intended for analysis)	Nominal	Hand coded	

Communicative Functions

1 - Information Sharing

"The first type of social media status focuses on information-sharing, which highlights a one-way messaging strategy that simply shares information" (Saxton)

2 - Promotion

"Although remaining one-way in nature, the purpose of these updates is to encourage and empower those who see the message to do something for or on behalf of the organization" (Saxton)

3 - Mobilization - Facebook status updates in which users requested help or action from their network (Ellison, 2014)

A -

Request Type	Functional definition
	Examples (created for this paper based on observed patterns)
Recommendation & Social Connection	A subjective, open-ended request for suggestions, or, in the case of referrals/social connections, a request to be referred or introduced to a specific person.
	"What movie should I watch tonight?"
	"Can anyone recommend a good local plumber?"
Factual Knowledge	A question posed that assumes and expects a correct answer; objective as opposed to subjective.
	"Does anyone know where *Grease* is playing in town?"
	"What's the weather going to be like for the game tomorrow?"
Social Coordination, Invitation, & Offer	A search for others with similar agendas or motives or for company (an invitation), with an assumed goal of collaboration or meeting.
	"Who wants to get together after the conference for some drinks?"
	"Where should we meet before the concert Saturday?"
Favor/Request/ Collective Action	A request for help or action from one's network for any number of things, including physical assistance, needed items, or emotional support.
	"I need to get to the airport tomorrow morning and my car is on the fritz. Who can give me a ride pretty please?"
	"Can anyone loan me their copy of *Romeo and Juliet* this weekend? I need to read it for class."
Opinion/Poll	A request for an opinion to be given in reaction/response to a status update; a vote or a choice between two alternatives to be made; or a general solicitation of what people are doing.
	"What do people think of Proposition 4?"
	"Chicken pot pie or beef stew for dinner?"

Table 1: Mobilization Categories

Recommendation

B - Factual Knowledge

C - Social Coordination

D - Favor/Request

E - Opinion Poll

4 - Community Building

"Thank you to…"

"Congratulations to…"

(Ellison, et al., 2013)

Follow-up

0 - No email or PM was provided

1 - Provided email address

2 - Asked others users to PM/DM

Level of teaching experience identified

0 - not identified

1 - First Year Teacher

2 - Second Year Teacher

3 - three to five years

5 - more than 5 years

P - Pre-service (still in college)

S - Student Teacher

Instruction	Use the following subcategories if noted	
Classroom Management Course Outlines/Pacing Guides Unit Curriculum Lesson Curriculum/Sub Plans Field Trips General Resources Grading/Rubrics Instructional Supplies NGSS Testing/Assessment Project Plans	Ag Biology Ag Chemistry Ag Econ/Ag Business Ag Leadership Ag Mechanics Agriscience (General) Animal Science California Commodities CASE Curriculum Current Events/Government Earth Science FFA (FFA Unit, Activities, etc.) Floral Design	General Shop Greenhouse/OH Natural Resources Plant Science Safety Small Engines Soil Science UC/CSU/A-G Approved Course UCCI Vet Science Welding Wood Shop Other

FFA	SAE

Alumni
Banquet/Awards Ceremonies
Career Development Events
*Identify area in notes section (includes Agriscience Fair)
Chapter Meetings/Activities
Conferences (includes logistics)
    State FFA Convention (includes CA Adventure/Disney)
    National FFA Convention
    MFE/ALA/Greenhand
    Other (includes general Travel/ Hotels)
FFA Jackets
Field Day Specific (Fresno, Chico, Cal Poly etc.)
Fundraisers
Leadership Development Events
(Creed, Impromptu, Prepared, Extemp, Parli Pro, Job Interview, etc.)
Officer Teams (Applications, Training, Management, etc.)
Student Motivation
Scholarships & Grants
Social Media
Other
	General
	AET Record Books
	Fair
	Ideas
	Management
	Proficiencies
	Show Teams
	Student Contracts
	Student Motivation

	Department Management
	*Management of funds Booster Clubs/Parent Groups Budgets (Budget cuts) Class Scheduling Funding Grants (AIG, CTEIG, Writing, Managing) Parents/Stakeholders Recruitment Roster (FFA Roster, R2, etc.) Other (make note if necessary)

Facilities/Equipment	Non-Specific/Other
*Defined as goods that are depreciable/last more than one year. *Items for sale or purchasing items *Equipment purchased with grant money will be categorized here, and noted as a grant purchase. Ag Mechanics Shop Ag Truck/Department Vehicles Building Improvements Classroom Supplies/Furniture Greenhouse/OH/Floral (including pots and floral equipment) Livestock owned by the school School Farm Storage Other (make note if necessary)	CATA General (includes Golden Slate) CATA Summer Conference (includes Banquet, workshops, etc.) Professional Development (XLR8, CASE, Delta, NAAE, Teacher Ambassadors) Commiserate Credentials (CSET, CBEST, Additional Credentials) Funny/Humor Job Opportunities Personal life/ Work-life balance Stipends/Salary Vision 2030 Goodwill (Checking on others after disaster) Other (includes CalAgPlates, MJDOA, Current Events/Govt. make note if necessary)

VITA

Kathryn Louise Teixeira

Candidate for the Degree of Doctor of Philosophy

Thesis: CONTENT ANALYSIS OF A CLOSED FACEBOOK GROUP FOR SCHOOL-BASED AGRICULTURAL EDUCATION TEACHERS IN CALIFORNIA

Agricultural Education

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy/Education in your major at Oklahoma State University, Stillwater, Oklahoma – May 2020.

Completed the requirements for the Master of Science in Agriculture at California Polytechnic State University, San Luis Obispo, CA – June 2014.

Completed the requirements for the Bachelor of Science in Agricultural Science at California Polytechnic State University, San Luis Obispo, CA – March 2009.

Experience:

July 2017 to present	**Graduate Teaching Assistant** Agricultural Education, Communications and Leadership Department, Oklahoma State University
August 2011 to June 2017	**Agriculture Teacher**, Anderson Union High School Anderson, California
August 2010 to June 2011	**Agriculture Teacher**, East Nicolaus High School Trowbridge, California

Professional Memberships:
- Oklahoma Farm Bureau Young Farmer and Ranchers, Member
- International Society for the Scientific Study of Subjectivity, student member
- American Association for Agricultural Education (AAAE), student member
- California Agricultural Teachers Association – Member