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Review Process for the North Central Research Conference

University of Minnesota faculty, as the 2020 NC-AAAE Conference Research Host, and members of the North Central AAAE Research Committee wish to recognize the nine colleagues who served as the panel that evaluated this year's research submissions. Of the 47 research abstracts submitted, 12 abstracts were selected for poster presentation at the 2020 Virtual North Central Conference.

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**Application of Transformative Learning Theory (TLT) to Extension Programming:
Implications for Extension Professionals**

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Application of Transformative Learning Theory (TLT) to Extension Programming: Implications for Extension Professionals

Introduction and Background

"Since its inception, the main purpose of the Cooperative Extension Service has been to change human behavior by teaching people how to apply the results of scientific research" (Rogers, 1963 p.16). Extension educators developing programs that involve changing human behavior must understand concepts of educational theories to improve the probability of realizing desired program outcomes. Program development (PD) has a long history in Extension. Its early efforts date back to the 1940's when Tyler (1949) proposed a three-step (plan, do, and review) model. Since Tyler's model, several experts (Boyle, 1981; Boone, Safrit, & Jones, 2002; Caffarella & Daffron, 2013; Franz, Garst, & Gagnon 2015; and Seevers & Graham, 2012) have discussed program development models keeping in mind the changes that have occurred in Extension. Consensus from these discussions suggest that the goal of PD is to facilitate changes in knowledge, attitude, skills and behaviors (KAS-BC) through a systematic process.

To develop most effective Extension programs, Extension professionals must understand the importance of program theory and its role in the PD process. Theory also provides uniformity and "becomes a predictor of facts" and "stimulates and guides scientific inquiry and analyzes and explains its findings" (Boone, Safrit, & Jones, 2002 p.65). Direct application of program/learning theories can guide Extension program development, delivery, and evaluation. According to Sidani and Sechrest (1999), program theory consists of a set of statements that describe a particular program, explain why, how, and under what conditions the program effects occur, predict the outcomes of the program, and specify the requirements necessary to bring about the desired program effects.

Considerable debate exists on when to use program theory in the PD process. Once the conceptual foundation for a program has been developed, then it is appropriate to consider program theory (Prosavac and Carey, 1997). Such sequence in the early stages of the program increases the chance of program success. Therefore, a program theory should be developed prior to the commencement of the program (Bickman, 1987; Prosavac & Carey, 1997, Rogers et al, 2000). This is not often the case (Bickman, 1987; Reynolds, 1998; Rogers et al, 2000; Stufflebeam, 2000). However, even if the program is already underway, it is important to consider developing a program theory. Therefore, program theories can be developed during the operation of the program (Rogers et al, 2000) or prior to evaluating a program (Bickman, 1987).

Purpose and Objectives

The overall purpose of this paper is to emphasize the importance of program theory in the Extension program development process. To accomplish the purpose, we have crafted four objectives. First, we discuss the importance of program theory for Extension programming. Second, we briefly discuss the 10 stages of the Transformative Learning Theory (TLT). Third, we compare program theory and learning theory and how both have applicability to Extension programming. And fourth, we discuss applicability of TLT to Extension program development, delivery, and evaluation.

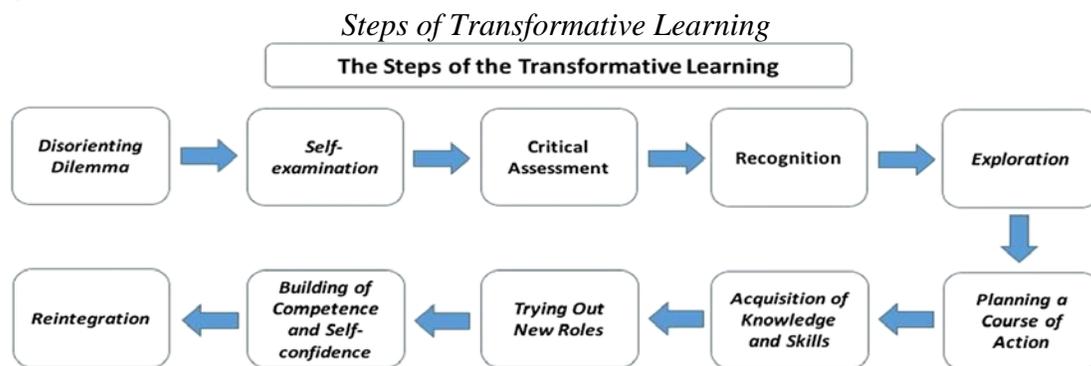
An overview of 10 stages of TLT (Figure 1 and Table 2) and the PD process is provided followed by application of this theory and its limitations using two distinct Extension programs.

Transformative Learning Theory (TLT)

Transformative learning theory, developed by Mezirow in the late 1990’s, focuses on how adults and groups change. Mezirow describes transformative learning as “learning that transforms problematic frames of reference to make them more inclusive, discriminating, reflective, open, and emotionally able to change” (Mezirow, 2009, p.22). Categorically allocated into the two dimensions: *point of view* and *habits of mind*, these frames of reference are the products of the absorption of cultural norms experienced by an individual due to the influence of predominant caregivers (Mezirow, 1997). Points of view, which are derived from beliefs, judgments and expectations, shape and influences how individuals see things (Mezirow, 2000) while “a habit of mind is a set of assumptions-broad, generalized, orienting predispositions that act as a filter for interpreting the meaning of experience” (Mezirow, 2000, p. 17). Deriving meaning, which is essential to the learning process, requires critical thinking and at least some degree of reflection. Critically reflecting on these assumptions on which we base our points of view and habits of mind allow individuals to transform their frames of reference (Mezirow, 1997). According to Mezirow, TLT explains how adult learners make sense or meaning of their experiences, how social and other structures influence the way they construe that experience, and how the dynamics involved in modifying meanings undergo changes when learners find them to be dysfunctional (Mezirow, 1997).

Mezirow’s theory, expressed in lay terms, argues that every individual has a unique view of the world. The unique worldview may or may not be well articulated. Transformative learning aims to help individuals challenge existing assumptions and make both behavioral and mental changes if they wish (Christie et al. 2015). According to TLT, individuals deciding on situations that affect their lives observe the adverse effects that occur in their decisions (Steps 1 through 3). In the future, individuals react differently not to feel the same effect again when they meet similar situations. Figure 1 illustrates the order of steps of the TLT.

Figure 1



Source: Yıldırım, M., Yelken, T.Y. The Development of Transformative Learning Scale for Information and Communication Technologies. *Tech Know Learn* (2019)

There have been numerous critiques with the most common argument suggesting that a significant flaw in Mezirow’s theory was its failure to account for context. In Taylor’s 1997 article ‘Building upon the Theoretical Debate: A critical review of the empirical studies of Mezirow’s transformative learning theory,’ he concluded that the influence of context in transformative learning has to be better understood and accounted for and that critical reflection is essential. Still, diversity in terms of class, ethnicity, gender, and sexual orientation needs to be addressed (Taylor, 1998).

We believe awareness and review of TLT stages and their applicability to the Extension PD process will help in developing strong and robust Extension programs. Further, the selection of an appropriate theory requires a needs assessment, target audience identification, development of the curriculum/program, determination of the proposed behavioral change, and establishment of measurable outcomes.

Program theory and learning theory, though two separate concepts, complement each other throughout the programming process. Transformative learning theory for example, as noted by Howie and Bagnall, (2013) “...begins with a person being engaged in activities that cause a disorienting dilemma leading them to modify or shift one of their meaning schemas or meaning perspectives, which are part of their frame of reference (Mezirow, 1991).” Program theory, which incorporates the function of identifying resources, activities and program outcomes (Bickman, 1987), is the means in which the activities utilized by the program are chosen or developed to foster transformative learning. Essentially, learning theory explains the process and in what manner transformational learning takes place while program theory acts as a guide to incorporate how the means in which an environment and activities are created or identified for this learning process to occur. Extension programming, through conjoined utilization of these two concepts, could benefit throughout the entirety of the program process through increased likelihood of program success via guidance of learning theory, as well as usage of identified effective activities that enhance the likelihood of participant and program success. Having these two theories can better inform the overall programming and evaluation process also. Program theory in particular has been used in the evaluation of outcomes in summative evaluation as well as formative evaluation to inform programmers of potential improvements during the program by monitoring program performance indicators (Rogers, 2000). Though there are similarities and differences between the two theories, Table 1 illustrates how the two complement each other in relation to the programming process.

Table 1:
Program Theory Vs. Learning Theory

Program Theory	Concepts	Learning Theory
Chosen by the programmer. Choice of program theory is dependent on desired program outcomes. “A program theory is concerned with understanding the effects expected of a program” (Sidani & Sechrest, 1999, p. 228).	Genesis	Chosen by the programmer to provide a framework for affective activities for transformational learning to take place.

<p>Identify effective program activities and conditions necessary for program affects to occur</p> <p>Predict the outcomes of the program as well as offers explanation of why and how the program works</p>	<p>Purpose</p>	<p>Describes the ‘types’ of activities necessary for ‘disorienting dilemma’ to take place</p> <p>Offers guidance or steps programmers can apply to activities to better ensure desired outcomes.</p>
<p>Selection of program theory is dependent on the six elements of program theory previously described by Sidani and Sechrest (1999) as “...problem definitions, mediating processes, expected output, exogenous factors, critical inputs and implementation issues” (p. 229)</p>	<p>Meaning/Approach</p>	<p>Selection of learning theory is based on, needs assessment, target audience, determination of proposed behavior change, etc.</p>
<p>“Broader” and more dependent on the type of program being implemented</p>	<p>Scope</p>	<p>More “specific” in that choice of learning theory is dependent on type of learning/behavior change desired</p>
<p>Non-formal – Cooperative Extension, volunteer organizations</p>	<p>Setting</p>	<p>Formal settings – secondary and post-secondary</p>

*Adopted from Imenda (2014): “*Is There a Conceptual Difference Between Theoretical and Conceptual Frameworks?*” Taylor, E.W. (2007). An update of transformative learning theory: a critical review of the empirical research (1999–2005), *International Journal of Lifelong Education*, 26, 2, 173-191, DOI: [10.1080/02601370701219475](https://doi.org/10.1080/02601370701219475)

Application of TLT to Extension Programs

Extension programs that lend themselves to adopt the TLT include a paradigm shift based on new research. Two examples of how Extension programs can adopt Mezirow’s theory:

- a. Dining with Diabetes – A nutrition education program for changing dietary habits of individuals with type 2 diabetes.
- b. Tree Fruit Mechanization – A horticulture program for increasing tree fruit production efficiency by reducing labor inputs.

For transformative learning to occur, the individual must pass through several stages. Taylor (1998) lists the ten stages of the transformative learner. Table 2 shows the 10 stages of TLT and its application to two major Extension programs—Dining with Diabetes and Tree Fruit Mechanization. Extension educators can see the value in not only understanding TLT, but also aligning their Extension programs when incorporating TLT in their PD process.

Table 2:*Application of TLT Stages to Two Distinct Extension Programs*

TLT Stages	Dining with Diabetes	Tree Fruit Mechanization
Disorienting Dilemma: This occurs due to an experience that does not fit the individual's diagram of meaning.	Individuals are diagnosed with type 2 diabetes and need to change their dietary guidelines	A shift in labor availability due to changing demographics and immigration creates a need to reduce reliance on hired employees
Self-Examination: the individual experiencing the dilemma examining themselves through certain emotions such as fear, guilt, shame.	During an introductory session, discussions examine the changes in dietary research, and how our food systems and lifestyles have evolved resulting in type 2 diabetes.	The initial session explores trends in regional/national labor availability.
A critical assessment of assumptions - individuals review themselves critically, evaluating their assumptions about the subject.	Individuals enrolled in the diabetes program examine their present lifestyle/diet and share with others in the group. Extension educators create an environment where individuals feel comfortable sharing personal experiences.	Group discussions occur with participants sharing their hiring strategies and failure to attract adequate labor.
Recognition that one's discontent and process of transformation are shared and that others have negotiated a similar change. Individuals become aware of the discontent and the transformation through peer communication	Facilitated group discussion occurs. Participants share struggles to adopt new dietary habits and exercise programs.	Tree fruit growers share experiences and obstacles with adopting new technologies.
Exploration Individuals discover his/her roles, relations, and options for the new situation that is realized at this stage.	Participants explore and share alternative strategies to change dietary habits and increase physical activity.	Orchard managers explore new strategies for mechanizing fruit production operations.
Planning a course of action. Individual has created an action plan based on the	Participants in diabetes management programs	Tree fruit growers formulate a strategy and financial timeline to increase

newly discovered options and roles.	develop an individualized diet and exercise plan	mechanization and reduce reliance on hired labor.
Acquisition of knowledge and skills for implementing plans	Diabetes program participants assemble recipes/ingredient sources and explore options for increasing physical activity	Orchardists research costs and availability of alternatives to mechanize operations and additional training to maintain and operate machinery.
Provisionally trying out new roles.	The individual participant initiates the new behavior independently and records their new activity or behavior in a journal.	For the orchardist, this may entail replanting a block of fruit trees at a higher density or different design to accommodate a mechanical equipment
Building of competence and self-confidence in new roles and relationships. Self-confidence by recognizing his/her competence in the new role. Experience is gained process by solving potential problems.	After successful adoption of new dietary habits and increased physical activity, a program metric such as bloodwork to determine any change in A1C levels or weight loss are measured.	In the orchard, reduction in labor costs and increased profitability are measured. May take a few years to accomplish.
A reintegration into one's life based on conditions dictated by one's new perspective - the individual adapts his/her role based on the conditions of the new approaches.	Program participants successfully make permanent lifestyle changes	Orchard operators successfully integrate multiple labor-saving practices and automation to reduce labor needs.

Summary, Conclusion and Implication for Extension Programming

Several program/learning theories are applicable to a variety of Extension programs with best usage of each theory being situationally dependent.

In conclusion, TLT works well where non-traditional concepts are introduced. An example is the conversion of conventional apple production systems to a new system characterized by mechanically assisted harvesting and retrofitting orchards with new varieties on a seven-year rotation compared to traditional 25-year rotations. The Extension program will initially work to demonstrate how traditional orchard management approaches are no longer ideal with a changing environment of labor shortages and rapidly changing consumer preferences for apple varieties. Once the program participants accept the new paradigm, action plans can be developed to adopt new orchard management practices.

Based on the description of TLT and its applications to two Extension programs, the following recommendations/implications are offered for Extension programming.

First, Extension educators should review program/learning theories and their suitability to the Extension programs they are developing. They need to thoroughly understand the various steps/stages on the theory and how it applies to their Extension programs. We suggest that Extension educators should use a specific theory once the conceptual foundation for the program has been developed.

Second, program developers must link the theory they are using to program design and delivery. Such linkage will help in designing programs that explain why, how, and under what conditions the program effects occur, predict the outcomes of the program, and specify the requirements necessary to bring about the desired program effects (Sidani & Sechrest, 1999). Moreover, failing to incorporate program theory and/or learning theory throughout the programming process increases the likelihood of missed program and participant improvement opportunities, which in turn could also lead to gaps or shortfalls in the evaluation of the program. There are also benefits in developing a program theory. As previously noted, “articulating a program theory can expose faulty thinking about why the program should work, which can be corrected before things are up and running at full speed (Weiss, 1995)” (Rogers et al., 2000, p. 11). Also, developing a program/learning theory which enables staff and programmers to identify critical components and build a common understanding can be a rewarding experience (Rogers et al., 2000) if utilized in this process.

Third, Extension professionals with expertise in program evaluation should develop a profile of program theories/learning theories for Extension educators to use in their PD efforts. A collection of program theories highlighting key components or stages, description of how the theory operates in a programmatic context should be developed as a resource for Extension educators (University of Maryland Extension, 2013).

Finally, Extension staff development units should offer training programs relative to program theories and their application in the PD process. Such training will help strengthen program design, delivery, and evaluation. Both extension professionals and the organizations will immensely benefit from such efforts.

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Branding 1862 Land-Grant Institutions through Legislative Acts: A Historical Review

Audrey E. H. King & M. Craig Edwards

Introduction

A *brand* is defined as a “complex, interrelated system of management decisions and consumer reactions that identifies a product (goods, services, or ideas), builds awareness of it, and creates meaning for it” (Franzen & Moriarty, 2009, p. 6). Brands cannot be understood independent of the world or context in which such exists. A brand’s purpose, vision, and values contribute to its mission and by definition what it illustrates and promotes (Franzen & Moriarty, 2009).

Regarding higher education, including land-grant institutions (LGIs), brands are of utmost importance to success in a rapidly changing consumer climate (Drori, 2013; Drori et al., 2013).

Issues in the Branding of LGIs

According to the Association of Public and Land-Grant Universities (APLU, 2019), LGIs were tasked historically with “teaching agriculture, military tactics, and the mechanic arts as well as classical studies so members of the working classes could obtain a liberal, practical education” (para. 2). At least one LGI was established in every U.S. state and territory. However, each had the freedom to implement its mission in various ways (Gavazzi & Gee, 2018). The different expression and application of legislation by each state may have created identity issues for the nationwide system of LGIs. Gavazzi and Gee (2018) asserted that “the public at large has little understanding of how universities contribute directly to the well-being of communities, let alone understanding the more specific definition of what it means to be a land-grant institution” (p. 29). Nonetheless, Sternberg (2014) noted that “[LGIs] are one of the most precious if not always most highly visible resources this nation has” (p. 1). Although the tripartite mission of LGIs was established by a series of federal legislative acts, implementation of these founding federal statutes differed from state to state making each of the 110 college and universities with land-grant status unique (Campbell, 1995; Gavazzi & Gee, 2018; Sternberg, 2014).

Purpose/Research Question

This study sought to describe the branding of 1862 LGIs over time. One research question guided the study: How did the federal legislative acts associated with the funding and expansion of 1862 LGIs create and direct their *brands* over time?

Methods

We followed historical research methods to achieve the study’s purpose (McDowell, 2002), and interpreted our findings through the lens of Franzen’s and Moriarty’s (2009) branding concepts: *vision*, *purpose*, *values*, *brand mission*, *core concept*, and *essence*. We gathered primary and secondary sources by using Oklahoma State University library search tools. Key search terms were agricultural experiment station, branding, college of agriculture, Cooperative Extension Service, Hatch Act, history, image, land-grant, Morrill Act, Smith-Lever Act, and university. Primary sources included records of legislative acts, related documents, and government reports.

Secondary sources were books describing the history of LGIs and peer-reviewed journal articles. All sources were examined to establish authenticity and accuracy through internal and external criticism, including the triangulation of findings (McDowell, 2002).

Findings

Legislative Acts that Shaped the Brand of the 1862 LGIs

The Land-Grant College Act (or Morrill Act of 1862). The act became law when signed by President Lincoln on July 2, 1862 during the American Civil War (Morrill Act of 1862, 1862). As law, it established the teaching arm of LGIs (Herren & Edwards, 2002). Thirty-thousand acres or an equivalent amount of land scrip was granted to every state for each state's senator and representative in Congress as a source of funding (Campbell, 1995). The LGI was touted as "higher education for the public good," i.e., for the *common man* (Gavazzi & Gee, 2018, p. 1).

Initial Manifestation of the 1862 LGI Brand. With enactment of the first Morrill Act in 1862, the brand of the LGI was formally established. The *mission*, or the focus of the brand, was "to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe" (Morrill Act of 1862, 1862, para. 4). The *vision* of the brand was "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life" (Morrill Act of 1862, 1862, para. 4). The *value*, or lasting contribution to society of the brand, was an educated industrial class of Americans by offering higher education to those who before seldom had that opportunity. "The concept for the land-grant model . . . developed out of the need for a maturing nation to educate its citizens to cope and excel in a world that was changing faster than it had ever changed before" (Herren & Edwards, 2002, p. 95). Therefore, the *essence* of the original LGI brand was education of the masses through teaching, i.e., educating the common man was established as a *core concept* of the brand.

The consumer or audience of the brand at its inception was primarily the nation's white industrial class who were meant to understand the brand as dedicated to educating their sons *and* daughters as a *public good to society*. With the inclusion of females, LGIs were among the first coeducational colleges in the nation (Beale, 1973). For the first time, education was available to common people instead of only the elite or wealthy members of society (Herren & Edwards, 2002). From the beginning, LGIs were intentionally established with an emphasis on public-service to all, despite social standing or class (Campbell, 1995). Or, as Herren and Edwards (2002) concluded: ". . . just as America's government was designed 'of the people, by the people, and for the people' with emergence of land-grant universities, education was now also *of, by, and for the people* [emphasis in the original]" (p. 95).

Hatch Act of 1887. When the Hatch Act was signed into law by President Cleveland, the research pillar of the LGI was established (Campbell, 1995). As such, the purpose of the LGI brand was expanded from being singularly focused on post-secondary education to also include the "scientific investigation and experiment respecting the principles and applications of agricultural science" (Hatch Act of 1887, 1887, para. 2). The act established agricultural

experiment stations in each U.S. state and territory. These experiment stations were founded to conduct agricultural research specific to the regions' respective needs and interests (Kerr, 1987). Of note, the first station was initiated 12 years earlier in Connecticut (Kerr, 1987).

The legislation was first introduced in 1882, but controversy ensued about where control of the research stations would lie. The federal and state governments were expected to supply funding and the land-grant colleges would select the stations' personnel and disseminate their research (Kerr, 1987). The bill that eventually passed specified that stations should conduct original research related to agriculture and were to be created and supervised by the colleges. However, states could choose to have stations not connected with their colleges of agriculture. Similar to the Morrill Act, states were intended to implement provisions of the Hatch Act in concert with their unique needs and priorities (Kerr, 1987).

Expansion of the 1862 LGI Brand. The addition of agricultural research expanded the brand of LGIs. The vision of the brand changed to also include improving agricultural practices based on the application of research findings and not only instruction. This expanded purpose and mission included conducting research appropriate for ready application by farmers. Therefore, the core concept or essence of the LGI brand evolved to include *both teaching and research* that would benefit the nation's agricultural enterprise. The reception of the new brand of LGIs was varied. Although many farmers ignored the newly established research stations, some supported the concept and its aims. This group suggested stations test different varieties of seeds and disseminate their findings to farmers. Legislators also tasked these stations with inspecting seed, feed, food, and fertilizer for quality assurance and value (Kerr, 1987).

Smith-Lever Act of 1914. This act created the U.S. Cooperative Extension Service (CES) [Campbell, 1995; Smith-Lever Act, 1914]. David F. Houston, Secretary of Agriculture in 1914, lauded the Smith-Lever Act as one of the most innovative pieces of educational legislation to ever be implemented by any government (Campbell, 1995). It was part of a "comprehensive attempt to make rural life attractive, comfortable, and profitable . . . [to] solve the chronic problems of agriculture and rural life" (Campbell, 1995, p. 23). The act provided for "cooperative agricultural extension work between the agricultural colleges in the several states receiving benefits of an Act of Congress approved July 2, 1862, . . . and the United States Department of Agriculture (USDA)" (Smith-Lever Act, 1914, para. 1). The CES was created essentially to "diffuse among the people of the United States useful and practical information on subjects relating to agriculture, home economics, and rural energy and to encourage the application of the same" (Smith-Lever Act, 1914, para. 2). The Smith-Lever Act created the third pillar of LGIs.

Dissemination of information by the CES was intended to be practical applications of the research conducted at the research stations. Extension personnel began providing demonstrations for farmers and their wives (Smith-Lever Act, 1914). The term *cooperative* referred to the cooperation that local Extension personnel were to have with the USDA, and to the Service's funding model, i.e., its costs be shared by federal, state, and local governments (Campbell, 1995). Later 4-H was added to the portfolio of CES, thus including rural youth as a primary target group to serve (Beale, 1973).

Further Expansion of the 1862 LGI Brand. Establishment of the CES was an effort to bring the benefits of the LGI to not only college students and mostly agricultural producers and other rural citizens, but rather to all members of society (Campbell, 1995). This legislation completed the land-grant mission as it is known today. The core concepts of the LGI brand were now *teaching, research, and extension* in service to the American people and world.

Conclusions

Enactment of the legislation that established LGIs laid the brand's foundation. Subsequent legislation dictated changes to and adaptation of the brand. Despite that, the original brand mission and vision remained intact. The major legislation that occurred after the Morrill Act of 1862 essentially expanded and bolstered the ways and means for achieving the overall aim of LGIs. These changes supported the brand keeping its *essence* while expanding the foundations and audience. Such consistency is beneficial to a brand's long-term survival and success (Franzen & Moriarty, 2009).

From the beginning, the LGI sought to equip the common man and woman, i.e., children of the America's *industrial class*, with an education while also bettering society (Morrill Act of 1862, 1862). This education was intended to benefit society as a whole by creating opportunities for people to advance themselves and improve their lives, which implied social and economic mobility for many Americans (Herren & Edwards, 2002). The addition of research stations and the CES enabled LGIs to establish stronger brands and increase their brand presence by educating and serving an even larger portion of the nation's populace. These changes were reflective of the contexts in which LGIs evolved and grew. Franzen and Moriarty (2009) asserted that brands cannot be properly understood outside of the contexts in which they exist.

Recommendations

Brands of 1890 and 1994 LGIs should be examined, as well as the *entire land-grant system*. Additional research should also focus on manifestation of the LGI brand at individual institutions and the expression of such through external marketing and communication efforts, especially considering today's challenges and opportunities. Understanding the differentiation of brands associated with LGIs may be essential for preserving the identity and viability of the overall land-grant system while supporting each institution's autonomy and singularity. Moreover, investigating the internal awareness, knowledge, and perception of the LGI brand could benefit the overall system. Our findings should be included in course curricula examining the history of higher education in the United States. Although this study may be of special interest to agricultural communicators, it also could be a learning resource for practitioners of agricultural education, extension, and leadership, as well as future faculty members of those and allied disciplines.

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**A Case Study in Study Abroad Engagement in a College of Agriculture:
*Describing participation from 2014-2018 in relation to university and national benchmarks.***

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Introduction

Across the United States, the demographics of student populations at universities are becoming increasingly diverse, however higher education institutions are still seen underserving and underrepresenting their students of color (AACU, 2019). Similar trends are also reflected in enrollment data of colleges of agriculture, sparking the need for efforts to support and assist these populations in a successful post-secondary education. Integration of High Impact Practices (HIPS) like study internships, undergraduate research and study abroad can assist with retention and success of students (Kuh, 2008). Study abroad enrollment, as well as student diversity within those enrolled, is also increasing, resulting in the need for more studies on how diverse students within colleges of agriculture can benefit from these experiences before, during, and after returning (Smith, et. al., 2013). In order to determine how to best fit these needs, comprehensive examinations of offered study abroad programming, students who are participating, and available resources must be compiled at individual universities. Analyzing the available data for your specific academic program areas and benchmarking against your institution and national information can be a precursor to a gaps analysis for potential interventions.

Theoretical Framework/Literature Review

The demand for global agricultural production has been predicted to increase by 70% (FAO, 2019). As the world adjusts to this increase, it will be vital for students to be studying agriculture, and to be globally competent in their knowledge of the industry. In 2015, the American Association for Agricultural Education (AAAE) published the third edition of the National Research Agenda. The purpose of this document was to identify the top 25 priority areas for those involved in agricultural communications, education, extension, and leadership to focus their research efforts on (Roberts, et al., 2016). Two of the key priority areas identified that are most relevant to this topic are priority 3, “What strategies are effective in recruiting diverse populations into agriculture and natural resources careers?” and priority 5 “What methods, models, and programs are effective in preparing people to work in a global agriculture and natural resources workforce?” (Roberts 6, et al., 2016).

Study abroad has been examined closely in the literature as far as increasing employability and post-return impacts (Harder, et. al, 2015). Studies have shown that employers are more likely to hire students in food and natural resources who have participated in a global experience over those of similar qualifications who have not. Additionally, while scant literature shows any negative ramifications from university students partaking in global learning experiences, the numbers of students who actually participate, particularly in students of color, are still low, although showing increasing trends in recent years. Researchers have attempted to examine the motivations and barriers that students may face when deciding to embark on these experiences. Several reasons found in the literature have shown to be barriers include financial, lack of interest, rigorous or inflexible degree programs, and impact from advisors and faculty (Rust, 2008).

Another group of researchers, Smith, Smith, Robbins, Eash, and Walker (Smith, et al., 2013), examined traditionally under-represented students changes in perceptions following an international experience in the areas of cultural awareness, knowledge of global affairs, interpersonal competence, personal attributes, and knowledge of the host country. The study covers the national trends of students, inside and outside of colleges of agriculture who study abroad, along with barriers for all students, and then specifically for those who fall into the underrepresented category. Ultimately, the study found that targeted efforts to specific to underrepresented students may increase enrollment and success in study abroad experiences for these students. Within the results and discussion portion of the study, the authors reiterate the proven importance of study abroad experiences for students in colleges of agriculture, specifically those who are traditionally categorized as underrepresented. Additionally, they discuss that different methods are recommended for various demographic.

In a summary prepared by Open Doors, a database reporting national data on study abroad, the percentage of students majoring in agriculture who participate in a study abroad experience increased from 1.5% to 2.5% between 2006 and 2016 (Institute of International Education, 2018). While the increase in student participation overall is positive, having such a small percentage of agriculture students' study abroad is becoming a felt need. As the world adjusts to this increase, it will be vital for students to be studying agriculture, and to be globally competent in their knowledge of the industry.

Purpose and Objectives

The purpose of the study was to describe engagement in the global learning portfolio of the Pennsylvania State University College of Agricultural Sciences of from 2014 to 2018 in relation to institutional level and national level accessible data.

The research objectives that guided the study include:

- 1) Describe non-travel options for academic engagement in global learning in agriculture by program in the College of Agricultural Sciences from 2014-2018.
- 2) Describe agriculturally related study abroad programs available in the College of Agricultural Sciences from 2014-2018 including area of study, duration, and location.

- 3) Describe demographics of participants in agriculturally related study abroad programs in the College of Agricultural Sciences from 2014-2018.
- 4) Compare demographics of participants in College of Agricultural Sciences agriculturally related study abroad programs to available university and national data.

Methods and Data

This descriptive research study was a time-bound case study of the College of Agricultural Sciences from 2014-2018. Secondary data sources provided by institutional assessment offices as indicated were utilized. Data was trusted to be valid and reliable in descriptive statistics of a bound population coming from a trusted source. The study was determined to be exempt from Human Subjects Research by the Institutional Review Board.

For research objective 1 (Describe non-travel options for academic engagement in global learning in agriculture by program in the College of Agricultural Sciences from 2014-2018”), Data were analyzed as provided from the College of Agricultural Sciences International Programs Office.

For research objective 2 and 3 (Describe agriculturally related study abroad programs available in the [College] from 2014-2018 including area of study, duration, and location and Describe demographics of participants in agriculturally related study abroad programs in the College of Agricultural Sciences from 2014-2018) Data were analyzed from summary reports provided by the Pennsylvania State University Global Programs Office.

For the final research objective 4 (Compare demographics of participants in the College of Agricultural Sciences agriculturally related study abroad programs to available university and national data), in addition to data provided from summary reports provided by the Pennsylvania State University Global Programs Office data were also utilized as summarized in the Open Doors Report (Institute of International Education, 2018)

Findings

Using organizational software, demographic data over a four-year period including all participants of study abroad opportunities (N=580) within the College of Agricultural Sciences was compared to averages from publicly available institutional and national level data benchmarks.

RO1: Describe non-travel options for academic engagement in global learning in agriculture by program in the College of Agricultural Sciences from 2014-2018.

Opportunities included the International Agriculture undergraduate minor, the International Agriculture and Development (INTAD) graduate program, and various listed careers and internships. Additionally, several research and outreach opportunities were listed, which included the Gender Equity Through Agricultural Research and

Education (GEARE) program, the International Food Safety Initiative, the Consortium for Ukrainian Rural Agricultural Development (CURAD) program, and other global partnerships.

RO2: Describe agriculturally related study abroad programs available in the College of Agricultural Sciences from 2014-2018 including area of study, duration, and location.

Programs included short term international embedded courses and summer programs, which were categorized as either faculty / staff-led, embedded courses, summer programs, domestic study away, or other. The university wide Global Penn State: Semester Abroad search page was listed, in addition to semester abroad by major. An opportunity specific towards Animal Science majors, at an abroad veterinary school was included, in addition to another course working specifically with farmworkers in the state of Pennsylvania

RO3: Describe demographics of participants in agriculturally related study abroad programs in the College of Agricultural Sciences from 2014-2018.

The demographic data that was provided in the secondary data set did not include a robust array of information, however gender, academic grade level, and ethnicity was reported. For gender, the majority was female, which is also reported at the national level. For academic grade level, the data was vastly juniors and seniors, however students are not able to immediately enter into their major program at the Pennsylvania State University which most likely impacted the data. Reported ethnicity was also included, which showed a majority Caucasian, with small percentages reporting Asian, African American, Hispanic/Latino, Indian American, International Student, Multi-Racial/Multi-Ethnic, or unknown.

RO4: Compare demographics of participants in College of Agricultural Sciences agriculturally related study abroad programs to available university and national data.

Data was analyzed by comparing averages and trends. When comparing the ethnic breakdown of participants within the college against that of all enrollees from the university, the college showed less diversity in the ethnicity of participants. Additionally, when looking at the national averages on reported ethnicity of participants, the overall university showed similar percentages with the national averages, yet the college itself was still less diverse.

Conclusions and Recommendations

Literature and data show the increase in diversity in student enrollment in universities and colleges of agriculture; however, diversity in student enrollment is not being reflected in global

engagement participations, such as study abroad, showing a need for improved efforts to increase participation of diverse populations. The case study findings based on the nationally provided data would indicate that nationally, there was an increase in diversity in student enrollment in universities and colleges of agriculture, which was seen slightly in the data provided from the Pennsylvania State University. When looking at participation in global engagement opportunities such as study abroad, the Pennsylvania State University data also showed a decrease in overall student enrollment, yet an increase in number of students participating in studying abroad, however the College of Agricultural Sciences data had a tendency to fluctuate over the time frame. The study only covered the data from one college of agriculture, thus is not generalizable to a larger population but would indicate a need and value in replicating studies with larger data population sets to determine the extent of this possible trend in colleges of agricultural across the nation.

From these findings, we recommend that additional research be conducted on the efforts and interventions being conducted by colleges of agriculture to increase diverse student population participation in study abroad. By examining their own current enrollment trends and encouraging sharing of information by peer institutions, university leadership/faculty should critically analyze potential specific challenges or opportunities are present within their own college processes for all populations to engage.

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**A Comparison of College of Agriculture Students' Pre-Transfer Experiences to Their
University Peers**

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A Comparison of College of Agriculture Students' Pre-Transfer Experiences to Their University Peers

Introduction

The National Center for Education Statistics (NCES) predicts by fall semester of 2027, undergraduate enrollment at postsecondary institutions in the United States will increase from 17 million to 17.4 million (NCES, 2017). An average of 39.3% of those students will enroll at a two-year institution (NCES, 2017) and Shapiro et al. (2018) estimates 38.0% of the students that start at a public, two-year institution will transfer to a four-year college or university. This positions public, two-year institutions as an important educational pathway for many American college students and signals the need for four-year institutions to minimize barriers and develop programming and best practices that support transfer student success. Especially, given that only 42.0% of American students who transfer from a two-year to a four-year institution complete a bachelor's degree program within six years of beginning their post-secondary education (Shapiro et al., 2017).

Hills (1965) first described *transfer shock* as a drastic decrease in academic performance in the semester(s) following transfer to a four-year university. Since that time, many scholars have studied transfer shock and the barriers associated with the phenomenon. Laanan (2001) estimated that nearly 8 out of 10 transfer students experience transfer shock due to a variety of factors. Laanan (2001, 2007) categorized these barriers into three areas: academic, psychological, and environmental. Umbach, et al. (2019) found that the individual characteristics (i.e., academic preparation, academic intention, credit accumulation, associate degree attainment, and transfer adjustment) accounted for 96% of the variance in first-semester GPA after transfer.

Understanding the decision-making process, and the impact of existing resources and programs, on certain populations, like Iowa State University's College of Agriculture and Life Sciences (CALs) students, will open the door for improved services that minimize these barriers.

Conceptual Framework

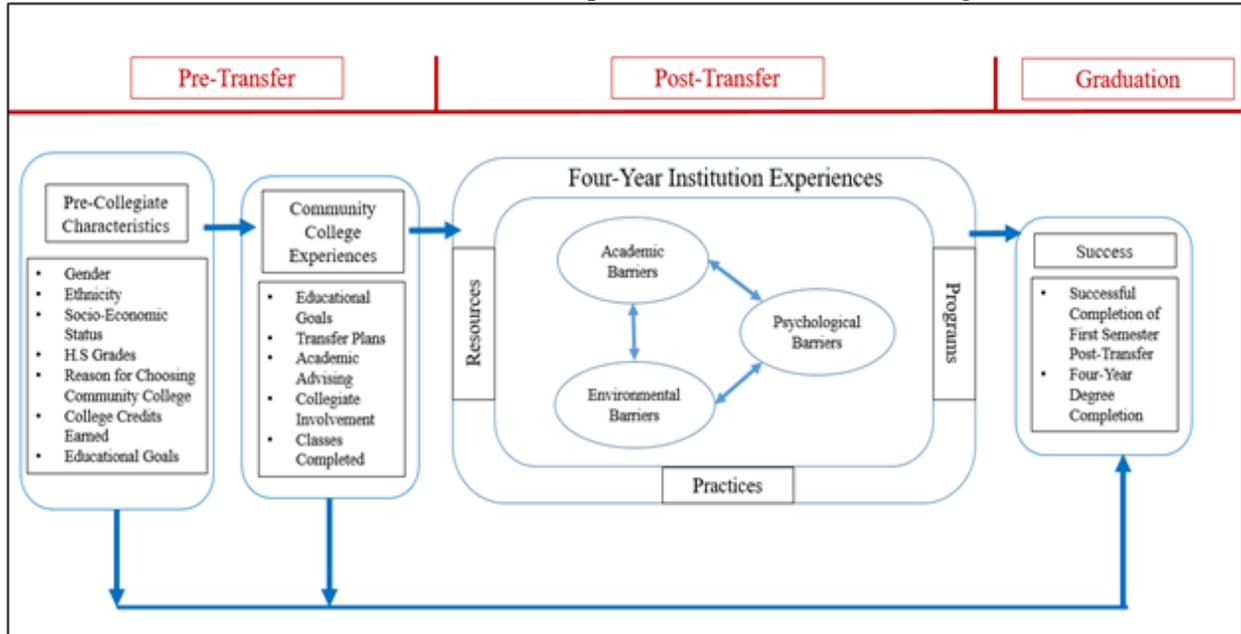
The Pre- and Post-Transfer Characteristics and Experiences Framework Leading to Student Success (Figure 1) was developed to guide this study. Foreman and Retallick's (2012) Collegiate Leadership Development model provided the initial structure and framework for the model and a comprehensive review of literature related to transfer and student success was used to fully develop the framework.

The framework suggests the combination of pre-transfer and post-transfer experiences and characteristics lead to student success including the ultimate success – graduation. Pre-transfer includes both a cadre of student characteristics including demographic, socio-economic, and academic preparation as well as community college experiences like academic rigor, academic advising and support, and transfer planning, resources, and support. The post-transfer component includes programming, resources, and best practices while minimizing academic, psychological, and environmental barriers. Graduation is the end result and the primary measure of success but can be evaluated at a more granular level including first-term completion and

persistence to second term, adequate progress through degree program, and on-time graduation rates. This study focused on the pre-transfer characteristics.

Figure 1

Pre- and Post-Transfer Characteristics and Experiences Framework Leading to Student Success



Purpose and Research Questions

The purpose of this study is to compare pre-transfer experiences of CALS transfer students to their transfer peers across Iowa State University. The following research questions guided the study.

- Are there differences in the factors that influenced student’s decisions and preparation to transfer?
- Are there differences in the transfer resources and their perception of helpfulness?
- Did CALS students utilize different academic advisement tools and have different experiences with their advisers than their peers?

Methods

This study was conducted as part of a larger research project designed to investigate the transfer process at Iowa State University. Second-semester undergraduate transfer students from both from 2- and 4-year institutions were surveyed using a researcher-developed survey instrument.

To develop the survey, six focus groups consisting of first-semester transfer students were conducted. Focus group feedback revealed themes associated with the transfer process (Siberski & Bundy, 2019). Using these themes and previously documented transfer student barriers (Laanan 2001, 2007), the researchers developed a survey instrument that was divided into three

sections: planning to transfer, experiences at previous institution, and experiences that occurred shortly after transfer.

Content and face validity were established by distributing the survey to administrators, faculty members, academic advisers, and student service specialists who were familiar with transfer programs and policies. These individuals were asked to provide feedback on question content as well as the structure, length, and composition of the instrument. Based on their feedback, changes were made to the number and content of questions within the survey. IRB approval was received.

Qualtrics (Qualtrics Labs, Inc., Provo, UT) was used to conduct a pilot study to test the reliability of the survey instrument. The survey was distributed to current transfer students within CALS (N=88) via email. Forty-four students responded (49% response rate). Following pilot data collection, exploratory factor analyses was completed to identify latent factors and facilitate item reduction. Based on the results of the pilot study, the instrument was further refined.

Qualtrics (Qualtrics Labs, Inc., Provo, UT) was used to conduct the survey. Student Registrar data were combined with survey results to address the research questions in this study. The survey instrument was sent via email, and three email reminders were sent to non-respondents. Once the survey closed, data from respondents were matched to Registrar's student records via email addresses. The data were then de-identified to ensure confidentiality.

The student experiences and all data collection for this study occurred prior to the Covid-19 Pandemic. The survey instrument was distributed to all 1,048 ($N = 262$ CALS, $N = 786$ non-CALS) students who entered ISU as a Fall 2019 transfer student. A total of 552 students responded (52.67% response rate) by starting the survey and 481 completed a significant enough portion of the instrument to be included in data analysis resulting in a usable response rate of 45.89%. The usable response rate of those students who responded from CALS was 39.65% ($n = 104$) and from non-CALS 45.67% ($n = 377$).

To address non-response error, demographic variables of respondents and non-respondents were compared using registrar data. Differences were found related to gender ($X^2 = 54.72$, $p < .000$), incoming GPA ($t = -6.02$, $p < .000$), and first semester GPA ($t = -6.026$, $p < .000$), where respondents were more likely to be female and have a higher incoming and first semester GPA. Therefore, caution should be made when generalizing beyond those students who responded.

Because the size of our comparison groups (i.e., CALS students and non-CALS students) was unequal, we used SPSS (version 25) to draw a random sample from the 377 non-CALS respondents to make two equal groups of 104 for analysis. Descriptive statistics including measures of central tendency were used to answer the research questions as where inferential statistics including T-statistics and Chi-squared to determine differences.

Results

To address research question one, data were collected related to factors influencing student decision to transfer and whether students' intention to transfer was planned prior to attending

their previous institution. Respondents were provided 22 different factors that potentially influenced their decision to transfer (Table 1). More than 50% of transfer students reported that availability of major, expertise in major, job placement rates, internship opportunities, and academic clubs and activities were influencers. Of the 22 factors, statistically significant differences were found between CALS and non-CALS with five factors. CALS transfer students were more likely to report that availability of major, expertise in major, job placement rates, and academic/merit scholarships as decision factors. Non-CALS students were more likely to consider the ability to live at home. Between 65% and 67% of respondents reported that they intended to transfer when they enrolled in their previous school and there were no statistically significant differences between the two groups (Table 2).

Table 1
Factors influencing decisions to attend ISU comparing CALS and non-CALS transfer students,
 (N = 208)

Factors Influencing Decision to Attend	CALS (<i>n</i> =104)		Non-CALS (<i>n</i> =104)		χ^2	<i>p</i>
	<i>n</i>	% of Respondents	<i>n</i>	% of Respondents		
Availability of Major	91	87.50	78	75.00	5.33	.02*
Expertise in Major	84	80.77	60	57.69	13.00	.00*
Job Placement Rate	71	68.27	53	50.96	6.47	.01*
Internship Opportunities	63	60.58	53	50.96	1.95	.16
Academic Clubs and Activities	59	56.73	49	47.11	1.92	.17
Academic Support	49	47.11	47	45.19	.08	.78
Academic/Merit Scholarships	42	40.38	28	26.92	4.22	.04*
Study Abroad Opportunities	40	38.46	36	34.61	.33	.57
Other Extracurriculars	32	30.77	38	36.54	.78	.38
Need-based Financial Aid	30	28.85	35	33.65	.56	.45
Student Wellness Services	24	23.08	28	26.92	.41	.52
Participate in Faculty Research	22	21.15	17	16.35	.79	.37
Participate in a Collegiate Team	22	21.15	15	14.42	1.61	.20
Mental Health Services	19	18.27	21	20.19	.12	.73
Less Expensive Tuition	17	16.35	26	25.00	2.34	.12
Ethnically Diverse Student Pop.	16	15.38	24	23.08	1.98	.16
Community Service Opportunity	16	15.38	16	15.38	.00	1.00
Honors Program	15	14.42	19	18.27	.56	.45
Off-Campus Recreation	14	13.46	20	19.23	1.27	.26
Could Live at Home	8	7.69	19	18.27	5.15	.02*
Participation in Athletics	7	6.73	14	13.46	2.56	.11
Participation in Music/Theater	5	4.81	5	4.81	.00	1.00
Other	5	4.81	3	2.88	.52	.47

**p* ≤ .05

Table 2

CALS and non-CALS transfer students' intention to transfer, (N = 208)

Intention to Transfer	CALS (<i>n</i> =104)		Non-CALS (<i>n</i> =104)		χ^2	<i>p</i>
	<i>n</i>	% of Respondents	<i>n</i>	% of Respondents		
Yes	70	67.31	68	65.38		
No	24	23.08	19	18.27	2.43	.29
No Response	10	9.62	17	16.35		

**p* ≤ .05

Research question two focused on transfer resources used and their helpfulness to aid in successful transfer completion (Table 3). Of the seven transfer resources provided, three were statistically different. CALS students were more likely to use a university academic adviser and admissions counselor, while non-CALS students were more likely to use the Admissions Partnership Program (APP). The remaining resources where no differences were found include course equivalency guides, transfer plans, TRANSIT, and availability of transfer scholarships. When asked to rank the helpfulness of these resources, CALS students ranked academic adviser, transfer plans, and course equivalency guides the highest and TRANSIT, Admissions Partnership Program, and university admission counselors lowest (Table 4).

Table 3

Differences in the use of transfer resources between CALS and non-CALS students, (N = 208)

Transfer Resource Use	CALS (<i>n</i> =104)		Non-CALS (<i>n</i> =104)		χ^2	<i>p</i>
	<i>n</i>	% of Respondents	<i>n</i>	% of Respondents		
ISU Academic Adviser	68	65.38	51	49.04	5.86	.05*
Course Equivalency Guide	48	46.15	36	34.62	3.79	.15
Transfer Plan	47	45.19	46	44.23	2.24	.33
ISU Admissions Counselor	24	23.08	9	8.65	9.07	.01*
TRANSIT	23	22.11	26	25.00	2.76	.25
Other	18	17.31	22	21.15	3.07	.22
Admissions Partnership Program	8	7.69	16	15.38	5.92	.05*
Availability of Transfer Scholarships	4	3.85	3	2.88	2.17	.33

**p* ≤ .05

Table 4

Differences in the perceived usefulness of transfer resources between CALS and non-CALS students, (N = 73)

	Mean Weighted Scores of Transfer Resources			
	CALS		Non-CALS	
Transfer Resource Usefulness	<i>n</i>	Ranking	<i>n</i>	Ranking
ISU Admissions Counselor (<i>n</i> = 26)	10	3.30	16	1.94
Admissions Partnership Program (<i>n</i> = 22)	7	3.14	15	2.73
TRANSIT (<i>n</i> = 44)	21	3.05	23	2.17
Availability of Transfer Scholarships (<i>n</i> = 29)	22	2.77	7	3.29
Course Equivalency Guide (<i>n</i> = 71)	38	2.32	33	2.27
Transfer Plan (<i>n</i> = 73)	38	2.29	35	2.37
ISU Academic Adviser (<i>n</i> = 82)	44	1.52	38	2.00
Other (<i>n</i> = 6)	3	1.33	3	1.67

Note. Bold is the highest ranked resource for either CALS or non-CALS students.

Note. 5-point Likert-type ordinal scale was used: 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, and 5 = strongly agree.

Research question three focused on differences in the advisement tools and experiences. When asked to respond to seven statements related to the academic advising experiences (i.e., adviser knowledge of degree requirements, career options, transfer process, transfer resources, courses, responding in a timely manner, and serving as a mentor) there were no statistically significant differences between CALS and non-CALS respondents and the mean responses were all somewhat or strongly agree (Table 5).

Table 5

Differences in academic adviser experiences between CALS and non-CALS students, (N = 208)

Academic Adviser Experience	CALS (<i>n</i> =92)		Non-CALS (<i>n</i> =85)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Knowledge of Degree Requirements	4.67	.73	4.68	.68	-.08	.94
Responds to Concerns in a Timely Manner	4.53	.95	4.64	.71	-.82	.41
Knowledgeable about Applying Transfer Course	4.47	.99	4.46	.91	.06	.95
Knowledgeable about Transfer Process	4.42	.96	4.45	.93	-.16	.87
Knowledgeable about Career Options	4.41	.92	4.41	.81	.01	.99
Knowledgeable about Transfer Resources	4.18	1.01	4.21	1.11	-.16	.87
Served as a Mentor	4.04	1.07	3.79	1.08	1.58	.11

**p* ≤ .05

Note. 5-point Likert-type ordinal scale was used: 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, and 5 = strongly agree.

When asked what types of campus visits they used, the most common for both groups were custom college visits, Experiences Iowa State day, and Transfer Tuesday visit day (Table 7). Of all the options, the only difference between groups was with youth organization/conferences where CALS were more likely to report using them as a type of visit.

Table 6

Differences in utilization of campus visits between CALS and non-CALS transfer students, (N = 208)

Campus Visit Use	CALS (<i>n</i> =104)		Non-CALS (<i>n</i> =104)		χ^2	<i>p</i>
	<i>n</i>	% of Respondents	<i>n</i>	% of Respondents		
Custom College Visit	23	22.12	21	20.19	1.97	.37
Experience Iowa State (EIS)	21	20.19	17	16.35	2.18	.34
Transfer Tuesday Visit Day	19	18.27	26	25.00	4.24	.12
Group Visit	12	11.54	14	13.46	2.37	.31
Admissions Daily Visits	10	9.62	6	5.77	2.75	.25
College/Dept Visit Day	10	9.62	3	2.88	5.46	.06
Youth Organizations/Conferences	9	8.65	0	0.00	10.71	.00*
Other	3	2.88	4	3.85	2.21	.33

* $p \leq .05$

Conclusions, Implications, and Recommendations

This research study examines the pre-transfer characteristics and experiences comparing CALS and non-CALS students. From the results of this study, it could be concluded that more similarities exist than differences. It appears that the similarities between groups occur with university-level resources and the differences are more college-focused. Therefore, it is recommended that university-level efforts continue to focus and develop programming and resources that meet the needs of all students and colleges develop and offer specialized programming that meet the needs of specialized groups and individual student needs, which will result in a more intentional and personalized student experience.

Through this analysis and the supporting literature, it can be concluded that it is vitally important that CALS and the university not only provide resources, but also ensure that incoming transfer students and advisers know those resources exist. Of those student participants who responded to this survey, only 44% report working with an academic adviser prior to transfer. Of those students who worked with an adviser, most reported this resource as the most important tool used in the transfer process and those students who worked with an adviser reported a high degree of satisfaction with the experience. According to this research, academic advisers were an under-utilized communication resource for transfer students and improvement in this area could lead to improved student success and higher levels of completion.

The results of this study have recruitment implications for CALS. CALS students were more likely than their non-CALS peers to indicate that availability of major, expertise in major, job placement rates, and academic/merit scholarships as decision factors in transferring. In addition, CALS students ranked academic adviser, transfer plans, and course equivalency guides as the most helpful resources. Efforts should be made to customize both written materials and campus visits to reflect these priorities.

While this research did reveal important trends in the transfer student experience and in resource use by transfer students, caution would be advised in the interpretation and application due to some instances where there were statistically significant differences and, yet, little practical differences. For example, non-CALS students were more likely to use APP, however only 15% of non-CALS and 8% of CALS students used the program.

This study focused on pre-transfer experiences of transfer students. Further research is needed to learn more about the transfer student experience, specifically those experiences unique to CALS students. Research topics should include barriers to student success, the impact of academic advisers on student completion rates, and the activities and procedures which improve transfer student integration into academic life. It may be necessary to expand the breadth of this topic by studying (quantitatively and qualitatively) future classes for comparative data or conducting interviews with students in order to expand this research: dialogue with students may reveal deeper and more complex examination of the nuances of the student transfer process. It would also be valuable to study the pre-transfer characteristics and experiences of those who intended to transfer, but ultimately did not.

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Compassion Fatigue in Secondary Career and Technical Education Teachers

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Introduction

Student success has been positively correlated with supportive teachers (Klem & Connell, 2004). Students are more likely to become disengaged from school and from post-secondary planning when they do not have a strong connection with educators (Appleton, Christenson, & Furlong., 2008; Appleton, Christenson, Kim, & Reschly., 2006). While there is much support and need for teachers to be kind and empathetic to students, they are also vulnerable to burnout and/or compassion fatigue (Stebnicki, 2007; Figley, 2013).

The concept of compassion fatigue evolved from earlier investigations of professional burnout. Figley (1995) brought clarity to the concept of compassion fatigue by defining burnout as a process that develops over time while compassion fatigue was described as an acute condition that comes on quickly with little or no warning. Mathieu (2007) stated, compassion fatigue is an occupational hazard and that almost every professional who cares about the individuals they are helping.

Agriculture teachers reported having high levels of stress (Lawver & Smith, 2014). According to Johnson et al. (2005), teachers' stress levels are similar to paramedics, police, and social service workers. It is likely that students are negatively impacted when their teachers suffer from burnout or compassion fatigue (Koeing, 2014). Learning more about stress and compassion fatigue can further inform programming and support systems aimed at Career and Technical Education (CTE) teacher retention and student success.

Conceptual Frameworks

The Professional Quality of Life (PRoQOL) Scale (Stamm, 2010) served as the conceptual framework for this study. PRoQOL is defined as the emotions related to an individual's work as a helping professional (Stamm, 2010). The PRoQOL framework explores both positive (compassion satisfaction) and negative (compassion fatigue) elements of work. Compassion satisfaction (CS) explores the emotional rewards of a job well done and the associated feelings of making a positive difference. Compassion fatigue describes the emotional and physical exhaustion that negatively impacts professionals over time (Mathieu, 2012) and is comprised of burnout (BO) and secondary trauma stress (STS) (Stamm, 2010). Baker (2012) defined BO as the progressive loss of idealism, goals, and energy from occupational stress whereas STS results from hearing about a traumatic event experienced by someone else and becoming traumatized (Bride, 2012).

Purpose and Objectives

By understanding the emotional toll of teaching, we can provide targeted professional development to help retain in-service teachers and better prepare preservice teachers. The purpose of this study was to explore compassion fatigue experienced by high school teachers. The specific objectives that guided this study were:

- 1) Describe the levels of compassion satisfaction (CS), burnout (BO), and secondary trauma stress (STS) of CTE teachers.
- 2) Determine if there are any differences in CS, BO, and STS levels between genders, years of experience levels, school district size, and field of CTE.

Methods

The target population for this study was all Career and Technical Education (CTE) teachers in South Dakota. However, the more accessible frame of 241 registered South Dakota Association of Career and Technical Education (ACTE) conference attendees was used. A recruitment letter with a QR code for the survey was placed in each registration folder. One follow-up email was sent for a response rate of 22.1% ($n = 53$). Respondents from administration, school counseling, and post-secondary divisions were removed, leaving a final teacher response rate of 18.7% ($n = 45$). Due to the low response rate and small study population, the results cannot be generalized beyond this study, but it does open the door for future investigations.

The instrument used for this study was the PROQOL scale. The instrument was developed and validated by Stamm (2010) with Cronbach’s alpha scores ranging from 0.72 – 0.87 (Bride, Radey & Figley, 2007). Data analysis followed the recommendations in the ProQOL manual. Due to the descriptive nature of objective one, mean scores and standard deviations were reported. For objective two, raw scores were converted to z-scores, which were converted into t-scores. One-Way ANOVAs on the t-scores for each construct were performed separately for gender, years of experience, school district size, and different areas of CTE.

The average participant of this study was female (76%), had 0-5 years of teaching experience (31.4%), and taught in a school district with PreK- 12 enrollment of 150-350 (26.5%). The participants represented 15 divisions in the ACTE organization.

Findings

Objective one sought to describe the levels of CS, BO, and STS of CTE teachers. Participants had moderate amounts of CS ($M = 39.7, SD = 4.7$) and BO ($M = 25.8, SD = 5.8$). The participants also reported moderate amounts of STS ($M = 24.2, SD = 6.1$) (see Table 1).

Table 1
Descriptive Statistics for Raw Scores of CS, BO, and STS Scales (n = 45)

Variable	<i>M</i>	<i>SD</i>
Compassion Satisfaction (CS)	39.7	4.7
Burnout (BO)	25.8	5.8
Secondary Trauma Stress (STS)	24.2	6.1

Note. The raw score for each construct is the sum of ten questions. (1 = never, 5 = Very often).

The second objective sought to determine if there are any differences in CS, BO, STS, rates between genders, years of experience levels, school district size, and CTE areas. No statistical differences were observed across gender (see Table 2).

Table 2

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by Gender

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
Male	11	50.7	9.1
Female	34	49.8	10.4
Burnout			
Male	11	53.0	9.2
Female	34	49.0	10.2
Secondary Traumatic Stress			
Male	11	51.2	9.0
Female	34	49.6	10.4

No statistical differences were observed across years of experience levels (see Table 3).

Table 3

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by Years of Experience

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
0-5 years	14	46.2	7.4
5-10 years	5	46.0	8.9
10-15 years	1	57.1	--
15-20 years	10	51.9	10.3
20-25 years	6	48.5	11.7
25-30 years	1	63.5	--
30+ years	8	50.0	8.9
Burnout			
0-5 years	14	51.2	8.0
5-10 years	5	52.4	11.8
10-15 years	1	52.0	--
15-20 years	10	48.6	11.0
20-25 years	6	51.8	7.0
25-30 years	1	48.6	--
30+ years	8	46.8	14.7
Secondary Traumatic Stress			
0-5 years	14	49.6	10
5-10 years	5	52.9	12.9
10-15 years	1	57.1	--
15-20 years	10	51.0	10
20-25 years	6	50.5	7.5

25-30 years	1	48.0	--
30+ years	8	48.2	12.9

No statistical differences were observed across school district size (see Table 4). However, school districts with populations of 500-750 and 750-1000 did show some differences across all three constructs that warrant further investigation.

Table 4
Descriptive Statistics for t- Scores of CS, BO, STS Scales, by School District Size

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
Fewer than 150	6	53.9	4.6
150-350	13	48.9	9.6
350-500	5	46.4	13.3
500-750	5	46.0	7.6
750-1,000	2	59.2	9.1
1,000-2,500	6	46.7	8.1
Over 2,500	8	54.1	13.1
Burnout			
Fewer than 150	6	48.8	14.6
150-350	13	50.8	10.7
350-500	5	50.3	8.0
500-750	5	57.9	7.2
750-1,000	2	45.1	.00
1,000-2,500	6	59.0	5.4
Over 2,500	8	48.8	14.6
Secondary Traumatic Stress			
Fewer than 150	6	44.5	7.0
150-350	13	51.7	11.9
350-500	5	48.4	7.1
500-750	5	59.1	4.5
750-1,000	2	39.1	3.5
1,000-2,500	6	51.6	4.0
Over 2,500	8	48.2	12.9

No statistical differences were observed across different areas of CTE. However, visual comparisons of the data indicate some potential differences between certain areas warranting further investigations. Due to submission limitations, Table 5 only explores the six areas of note.

Table 5
Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by CTE area: Agriculture, Food, & Natural Resources (AFNR)

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
AFNR	19	48.6	9.2
Not in AFNR	26	51.0	10.6

Burnout			
AFNR	19	52.4	8.7
<i>Not in AFNR</i>	26	48.2	10.7
Secondary Traumatic Stress			
AFNR	19	50.2	9.0
<i>Not in AFNR</i>	26	49.9	10.9

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by CTE area: Architecture

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
Architecture	1	65.6	--
<i>Not in Architecture</i>	44	49.6	9.8
Burnout			
Architecture	1	45.1	--
<i>Not in Architecture</i>	44	50.1	10.1
Secondary Traumatic Stress			
Architecture	1	41.5	--
<i>Not in Architecture</i>	44	50.2	10.0

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by CTE area: Health Science

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
Health Science	2	41.0	7.6
<i>Not in Health Science</i>	43	50.4	10.0
Burnout			
Health Science	2	54.6	8.6
<i>Not in Health Science</i>	43	49.8	10.1
Secondary Traumatic Stress			
Health Science	2	51.3	11.5
<i>Not in Health Science</i>	43	50.0	10.1

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by CTE area: Information Technology

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
Information Technology	2	47.5	1.5
<i>Not in Information Technology</i>	43	50.1	10.2
Burnout			
Information Technology	2	40.8	3.7
<i>Not in Information Technology</i>	43	50.4	10.0
Secondary Traumatic Stress			
Information Technology	2	41.5	7.0
<i>Not in Information Technology</i>	43	50.4	10.0

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by CTE area: Marketing

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
Marketing	1	63.5	--
<i>Not in Marketing</i>	44	49.7	9.9
Burnout			
Marketing	1	48.6	--
<i>Not in Marketing</i>	44	50.0	10.1
Secondary Traumatic Stress			
Marketing	1	48.0	--
<i>Not in Marketing</i>	44	50	10.1

Descriptive Statistics for t-Scores of CS, BO, and STS Scales, by CTE area: STEM

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Compassion Satisfaction			
STEM	5	56.2	10.7
<i>Not in STEM</i>	40	49.2	9.8
Burnout			
STEM	5	44.0	2.6
<i>Not in STEM</i>	40	50.7	10.3
Secondary Traumatic Stress			
STEM	5	49.7	6.2
<i>Not in STEM</i>	40	50.0	10.4

Discussion

Objective one sought to describe the levels of compassion satisfaction (CS), burnout (BO), and secondary trauma stress (STS) experienced by CTE teachers. While CS and BO rates were higher than an average score, they still fell within one standard deviation. However, measures for secondary trauma stress (STS) were 1.5 standard deviations above the mean, indicating elevated rates of STS.

Objective two sought to determine if there are any differences in CS, BO, and STS rates between genders, years of experience, school district size, and CTE area. No statistically significant differences were found across the groups. This is consistent with another small-scale study by Koenig (2014). However, Lawver and Smith (2014) did find difference in stress levels based on years of experience. Visual inspection of the data indicated some areas for future research with a larger sample size. Teachers who taught in districts with enrollment of 500-750 students had lower CS when compared to peers. Whereas teachers who taught in districts with 750-1,000 students had lower rates of BO and STS compared to their peers. Higher rates of CS were experienced by the Architecture, Marketing, and STEM areas, while Health Science and Information Technology had lower rates of CS. Health Science also had a higher rate of BO when compared to the other areas.

Recommendations for practice include offering professional development and other resources to help teachers manage compassion fatigue. Preservice programming could

incorporate information about how to process secondary trauma and promote self-care. Future research recommendations include completing this survey with a larger sample size, including items on the instrument related to career and technical student organizations (CTSO), and explore how school district size and services offered impacts teachers and their students

While this study focused on all areas of CTE, there are several factors of importance for the agricultural education profession. Literature has noted having an FFA chapter can increase agriculture teachers' stress level (King, Rucker, & Duncan, 2013). Does having a CTSO lead to higher rates of burnout? Supervised Agricultural Experience programs are a part of school-based agriculture education (Phipps, Osborne, Dyer & Ball, 2008). Supervising students in those programs also places additional stress and time commitment on teachers. Finally, it is not uncommon for agriculture teachers to have summer contracts (M. Nelson, personal communication, January 10, 2020). Does the lack of separation from school impact their levels of stress or burnout? More in-depth investigations should be conducted with a larger population of agricultural educators to determine their unique experiences.

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Does 4-H Parent Volunteering Impact Retention of High School 4-H Members?

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Introduction

Cooperative Extension and Land Grant institutions are paramount in serving the needs of young people through organizations such as 4-H. The 4-H mission is to empower youth to reach their full potential, working and learning in partnership with caring adults (4-H, 2013). The 4-H organization is important for both elementary and secondary age youth. 4-H has shown to help develop life skills, academic skills, self-esteem, resiliency, and citizenship; lower risky behaviors; and contribute to the development of communities (Avent & Jayaratne, 2017).

Times are changing, and 4-H is experiencing difficulty in recruitment and retention in certain age groups (Newby & Sallee, 2011). 4-H membership is declining- the number of members enrolling is fewer than the number of youth leaving. Most 4-H members are 8 to 10-year-old youth; however, teenage membership, starting around age 11, is decreasing at an alarming rate (Bartoszuk & Randall, 2011). Additionally, gender seems to also be a factor in decreasing numbers (Bartoszuk & Randall, 2011). One issue may be the 4-H organization is traditionally considered a club for rural and small communities, with mostly white youth, and are not meeting the needs of the ever-changing diversity of the agriculture population. This in turn creates a negative perception of agriculture by those living in urban populations (Newby & Sallee, 2011).

Parents are often involved in 4-H clubs as volunteers; parents often choose their children's experiences and activities (Harder et al., 2005). Radhakrishna et al., (2013) found parents are a vital part of 4-H programs, and their participation ensures unique growth experiences for their children. 4-H programs benefit from the roles that parents play, with many clubs relying on parents as resources for projects, and parents frequently act as 4-H volunteers (Radhakrishna et al., 2013). Parents were found to have the greatest influence on 4-H member enrollment (Gill et al., 2010). The interest of the parents may also factor into the higher rates of enrollment seen from ages 8 – 11, while the steady decline in member population begins at age 12 and continues on through age 18 (Harder et al., 2005).

Theoretical Framework

The study was guided by the Expectancy-Value Theory (EVT) of motivation (Wigfield & Eccles, 2000). Expectancy-value theory suggests adolescents' ability-expectancy beliefs and subjective task values determine their performance and choice to persist in activities. Relative to this study, subjective task values refer to the choice of certain tasks or activities for which students are intrinsically motivated to complete (Loh, 2019). Subjective task values and related

expectancy for success are found positively correlated and interactively linked to students' achievement and academic choices (Loh, 2019).

Objective

The objective of this research was to determine to what extent gender, parental education and involvement in 4-H programs explained differences in retaining high school age 4-H members. Specific research questions included:

1. Describe the gender, community size, and parental education of the sample.
2. Describe the involvement in 4-H of parents of high school agriculture students.
3. Determine to what extent gender, parental education and parental involvement in 4-H programs explained differences in retaining high school age 4-H members.

Ho: No significant differences exist between observed and expected values between gender, parental education, and parental involvement in 4-H programs in retaining high school 4-H members.

Ha: A significant ($p < 0.05$) difference exists between observed and expected values between gender, parental education, and parental involvement in 4-H programs in retaining high school 4-H members

4. Describe the reasons 4-H members chose to stay in 4-H or leave 4-H.

Methods/Procedures

Data was collected at the [University] District FFA Contest in [City, State], on March 10th, 2020. A paper and pencil survey was distributed to all FFA student attendees. This purposive sample was chosen based on their age and active involvement in extracurricular activities. The survey contained five demographic questions and seven questions pertaining to 4-H and FFA membership. 547 of 607 students returned completed surveys for a response rate of 90.1%. The survey was reviewed for face and content validity by a panel of experts prior to distribution, and all suggested edits were incorporated into the paper-and-pencil survey. All students were active participants in their high school secondary agriculture education program, ranging in age from 14 to 18 years of age. Student responses were anonymous, and the project was submitted to and approved by the institution's Institutional Review Board (IRB) prior to data collection.

Findings/Results

Objective 1:

Thirty-one FFA Chapters were represented in the research group. 218 of the 545 students responded that they had been or were currently in 4-H; 38.1% of male FFA students said they had been or were currently in 4-H, and were active in 4-H activities in a range of ages from 5-17. Of the female FFA students, 61% said they had been or were currently in 4-H, and began enrolling in 4-H activities as young as age 3 and as old as age 16. Of the male FFA students and female FFA students, only 7% and 25% respectively, continued to remain as active 4-H members, while also being active FFA members. The remaining statistical analysis was based on the 218 students who continue with dual membership in both 4-H and FFA.

Table 1. Demographics of participants

		4-H members (<i>f</i> ,%) (<i>n</i> =218)	All participants (<i>f</i> ,%) (<i>n</i> =545)
Gender			
	Male	83 (38.1%)	233 (42.8%)
	Female	133 (61.0%)	305 (56.0%)
	Missing	2 (0.9%)	7 (1.3%)
Community			
	Rural	149 (68.3%)	333 (61.1%)
	Suburban	62 (28.4%)	194 (35.6%)
	Urban	4 (1.8%)	12 (2.2%)
	Missing	3 (1.4%)	6 (1.1%)
Parental education			
	No Bachelor's degrees	82 (37.6%)	266 (48.8%)
	1 Bachelor's or higher	77 (35.3%)	154 (28.3%)
	2 Bachelor's or higher	59 (27.1%)	125 (22.9%)

About 38% of 4-H parents had earned no higher than a Bachelor's degree, whereas 49% of non 4-H parents had not earned a BS in their household.

Objective 2:

Researchers queried what proportion of current and former 4-H members' parents served as volunteers in the 4-H organization. One hundred and thirty three current and former 4-H

members (61.1%) responded at least one parent served as a 4-H volunteer, and 77 (35.3%) responded their parents did not volunteer.

<i>Table 2: Parent Volunteerism</i>	Participants (f,%)
Yes, volunteer	133 (61.1%)
No, do not volunteer	77 (35.3%)
Missing	8 (3.7%)

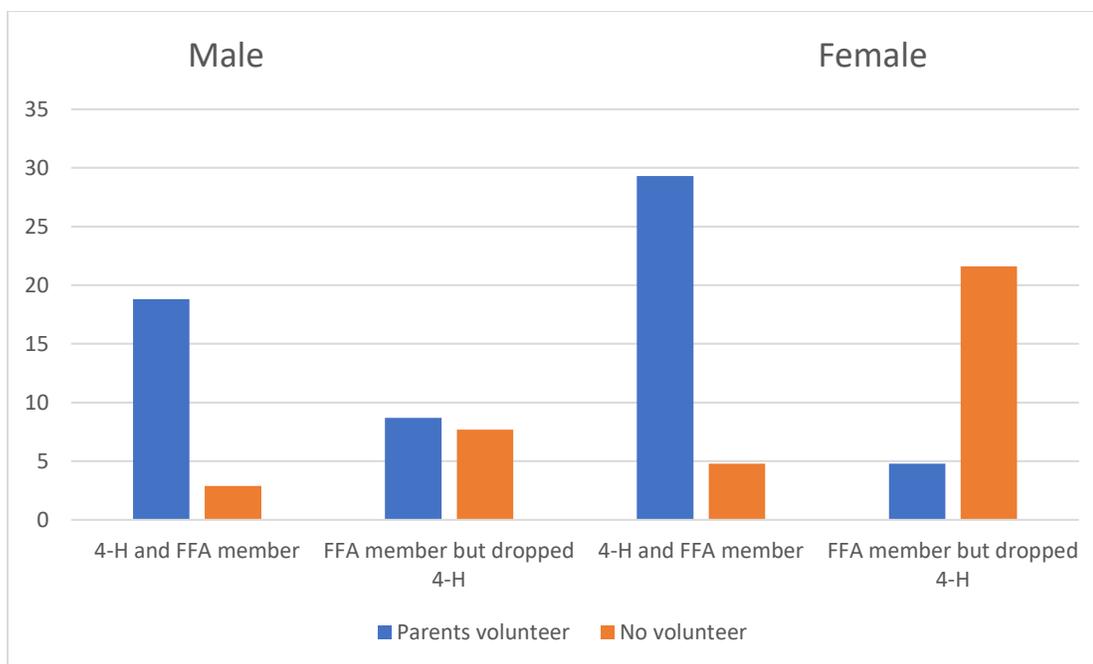
Objective 3:

Researchers conducted a log linear analysis to determine to what extent the data fit the model of gender, parental education, and parental involvement differences in 4-H members' persistence into high school. Cases with missing data were removed for the log linear analysis.

Preliminary modeling included parental education, parental involvement, gender, and 4-H retention. However, this violated the assumption of minimum frequencies for expected case sizes (Field, 2009). Therefore, researchers identified and removed parent education as the least contributing factor in the model, and data were collapsed.

The revised model of parental involvement, gender, and 4-H retention on met the assumptions for log analysis. The likelihood ratio of this model was $\chi^2(2) = 4.24, p = 0.12$. Researchers found a non-significant three way association $\chi^2(1) = 3.10, p = 0.78$ between member gender, parental involvement, and retention in 4-H. Researchers found significant two-way interactions between retention of 4-H membership and parental involvement $\chi^2(1) = 64.58, p < 0.01$ and parental involvement and gender $\chi^2(1) = 5.75, p < 0.01$. The main effects of gender $\chi^2(1) = 12.14, p < 0.01$ and parental involvement $\chi^2(1) = 14.18, p < 0.01$ were significant. The odds of an FFA member staying in 4-H during their FFA career was 2.17 higher for males and 4.69 higher for females whose parents served as 4-H volunteers. The researchers failed to reject the null hypothesis for the full model.

Figure 1. Distribution of 4-H membership by gender (n=208).



Of the 46 male FFA students who continued in 4-H, 39 had parents who volunteered. Of the 37 male students who left 4-H after they become involved in FFA, 16 parents were not involved in their 4-H experience. There were 74 female FFA students, who continued in 4-H, and 63 of their parents volunteered. Of the 61 female students who left 4-H after they become involved in FFA, 45 had parents were not involved in their experience.

Objective 4: Students were given an opportunity to check short responses as to why they chose to remain involved in both organizations or why they chose to leave 4-H. Of the 97 students leaving 4-H, the most common responses were involvement in other extra-curricular activities (19.7%), play sports (17.4%), took too much time to do both (15.6%), and loss of interest in 4-H (9.6%).

Table 3. Student reasons for leaving 4-H

Reasons for leaving 4-H (n=218)	Participants (f,%)
Involved in other extra-curricular groups/clubs	43 (19.7%)
Involved in playing sports	38 (17.4%)
Took too much time to do both	34 (15.6%)
Just not interested in 4-H any more	21 (9.6%)
I do not know why	10 (4.6%)
There are not 4-H clubs near my home	4 (1.8%)

Too expensive to do both 2 (0.9%)

The students who remained in both indicated they stayed as: 4-H looks good on a college application (37.6%), they enjoyed activities in both groups (44%), and both provide leadership skills (38.1%). Some students felt that the choice of differences in projects (25.7%), and also, that 4-H and SAE projects worked well together (28.4%).

Table 4. Student reason for staying in 4-H

Reason for staying in 4-H after joining FFA	Participants (f,%)
There are activities I enjoy in both	96 (44%)
Both provide leadership skills	83 (38.1%)
It looks good on a college application	82 (37.6%)
4-H works with my SAE project	62 (28.4%)
My parents make me do both	12 (5.5%)
I don't know why I do both	6 (2.8%)

Conclusion

For this sample, there seems to be a strong association between high school 4-H retention and parental volunteering in the club. Whereas many males stayed in 4-H when there was no volunteer, parental involvement was a substantial predictor of female students staying in 4-H. Results should not be inferred to other groups.

In objective one, we conclude these FFA members were mostly rural and about 40% were still enrolled in 4-H. male students are leaving 4-H as teen agers, whereas, girl students are staying in both 4-H and FFA. Over 62% of 4-H members had at least one parent with a college degree, this the number of members whose parents had degrees dropped to 51%. For objectives two and three, about 6 in 10 students reported their parents actively volunteered for their 4-H club. Researchers found gender and parental involvement play a significant part in helping teen 4-H members stay involved, even after joining FFA. Successful 4-H youth experiences depend on parental participation and involvement, particularly for female 4-H members, In order to keep high school youth involved, parents need to remain involved as well. We encourage 4-H leaders to recruit, equip, and coach parents of teens to become volunteers to facilitate 4-H teen membership. Additionally, market 4-H as a worthy organization for youth to maintain involvement. 4-H Club information should be provided at school events in urban and suburban schools, to promote the growth of inclusion in 4-H.

Objective four describes other extracurricular activities and sports are important factors in the reduction of older youth in 4-H. Too much time and lack of interest also score high on the

list of reasons to leave 4-H. Implications of this list describe the pressure on youth to achieve everything and will continue to impact organizations like 4-H. Leaders should be sensitive to the many demands put on 4-H teen members and maintain flexible schedules so students can still participate.

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Effectiveness of Social Media Marketing for Higher Education Recruitment

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Introduction

With the development of technology and increasing internet use, companies and brands are switching to using social media to enhance their marketing platforms (Cosby, 2015). Higher educational institutions are searching for new strategies to attract, enroll, and retain students. Universities have turned to a variety of web-based recruitment efforts including new apps, interactive websites, and social media platforms (Cosby, 2015). More and more companies are using creative, informative, and engaging social media marketing to catch the attention of current and potential customers. Since the current prospective post-secondary student pool comes from Generations Y (Millennials) and Z, the first step is to understand how they currently interact with social media and higher education. From there, the information can be used to develop social engaging, informative, and effective social media marketing strategies to recruit prospective students.

Generation Z (those born between the mid-1990s and mid-2000s) and Millennials (individuals born between 1980 and 2000) (Witt & Caldwell, 2018) have a unique relationship with social media. It offers Generation Z a means of comparison and a platform to seek feedback about their status by trying to build their audience by portraying very specific and appealing lives to build their social media audience (Witt & Caldwell, 2018). Due to technological advances in their lifetime, the Millennials have been exposed to marketing messages through a variety of mediums, making advertising a large part of their daily experience (Witt & Caldwell, 2018). Millennials are more likely to be accepting of information from their peers and friends than from those of traditional authorities (Nimon, 2007).

Professors or alumni are commonly used to promote universities, but studies have found that these promotions might be more successful if promoted by Millennials themselves (Nimon, 2007). Higher education institutions utilize media and technology to attract and connect them with both current and prospective students. Doyle (2014) noted that institutions need to make significant changes to remain competitive amongst each other. Technology is the main component that can cause this significant change. Social media marketing by universities should be looked at as a way to communicate with prospective students. A 2009 survey found that 61% of high school seniors said they would be interested in learning more information from colleges and universities via social media sites (“Joining the social media conversation,” 2009).

Kelly (2013) studied the effectiveness of Twitter as a communication tool in college recruitment and concluded some students do not think of Twitter as a source of information but view it as a social platform that is used to interact with friends. A 2009 study showed that only 24% of potential students increased their interest in a particular school after interactions via social networking sites but 88% increased their interest following a campus visit (Lipka). This issue needs to be explored further to better understand why new technologies, which can occupy several hours of a teenager’s day, are not effective in recruitment communication (Kelly, 2013).

Kelly (2013) suggested that colleges/universities should communicate via Twitter with audiences of all ages and academic standing by providing information for different types of viewers such as parents, counselors, and alumni and not just prospective students. Can social media marketing, be engaging and informative, but also effective at recruiting prospective students?

Theoretical Framework

The theoretical framework used for this study was Chapman's (1981) student college choice model. It identifies external factors that influence a student's choice to enroll at a post-secondary institution. These external factors can be grouped into three categories: (1) the influence of significant persons; (2) the fixed characteristics of the institution (ex. cost, location, availability of program); and (3) the institution's own efforts to reach prospective students. Due to technological changes that have happened since this model was first proposed, it's important to explore how social media plays a role in student choice.

Purpose and Objectives

Technological advances since Chapman's (1981) model warrants the exploration of newer technologies influence on students' enrollment decisions. The purpose of this study was to explore how social media marketing influences agricultural education students' decision to enroll at South Dakota State University. The specific objectives that guided this study were:

- 1) Determine where students have seen the university marketed prior to enrollment.
- 2) Determine to what extent social media marketing influenced students' enrollment decision.
- 3) Determine what factors influenced students' enrollment.

Methods

This action research project sought to explore how social media marketing influenced agricultural education students' enrollment decisions. The target population was current agricultural education majors enrolled at [UNIVERSITY]. An electronic questionnaire was sent out to 76 students via the Agricultural Education list serve. An initial email, and two follow up reminders yielded a final response of 29% ($n = 22$).

A researcher developed instrument was used. Items included concerned the types of university marketing they saw prior to enrolling, if their knowledge of the university increased due to social media marketing efforts and identified other factors that influenced their decision to attend. Items included on the survey were: To what extent do you agree that *prior to enrolling, my knowledge of South Dakota State University had increased due to marketing efforts* and *SDSU's social media presence played a role in my decision to enroll here*. Data for objectives one and three were collected using multiple response checklists, while objective two used interval response scales. Data for all objective results were reported using means and frequency counts.

The average participant in this study was female (68%) and enrolled at South Dakota State University from an out-of-state location (59%). It should be noted that 64% of respondents stated that they considered enrolling at other higher educational institutions.

Results

Objective one sought to determine where students have seen the university marketed prior to enrollment (see Table 1). Prior to enrollment the top five most common ways students were exposed to the university were social media, word-of-mouth, friends, teachers and on-campus events.

Table 1

Prior to Enrolling, I Had Seen or Heard South Dakota State University Marketed Through:

Item	Frequency	Percentage
Social Media	17	10.62
Word-of-Mouth	16	10
Friends	15	9.38
Teachers	15	9.38
On Campus Events	15	9.38
Family/Relatives	14	8.75
Posters	12	7.5
Guidance Counselors	11	6.88
The Internet/Websites	9	5.62
Billboards	9	5.62
Presentations	8	5
Fliers	6	3.75
Magazines	4	2.5
Television	4	2.5
Radio	3	1.88
Books	1	0.62
Other	1	0.62

Note. Participants were able to select as many as applicable

Objective two sought to determine to what extent social media marketing influenced students' enrollment decision (see Table 2). Students strongly disagreed that social media ($M = 2.32$, $SD = 0.81$) and marketing ($M = 2.55$, $SD = 0.86$) influenced their decision to enroll but agreed that it influenced others ($M = 4.00$, $SD = 0.54$). They also agreed that their prior knowledge of the university increased because of marketing ($M = 3.59$, $SD = 0.91$) and found university campaigns to be informative ($M = 3.68$, $SD = 0.65$).

Table 2

Extent to Which Social Media Marketing Influences Enrollment Decisions

Question	Mean	SD
<i>Marketing influenced my decision to attend</i>	2.55	0.86
<i>Prior knowledge of school increased because of marketing</i>	3.59	0.91
<i>Marketing Campaign informative</i>	3.68	0.65
<i>Social media influenced my decision to attend</i>	2.32	0.81
<i>Informative social media influenced others to attend</i>	4.00	0.54

Note. Scales were 1-5, with 1=strongly disagree and 5=strongly agree

Objective three sought to determine what factors influenced students' enrollment. Family/Relatives were identified as the most frequent influencers on enrollment decisions (see Table 3). This was closely followed by friends, attending on campus events, and in-person interactions and experiences.

Table 3

This Has Had an Impact on My Decision to Enroll at South Dakota State University:

Item	Frequency	Percentage
Family/Relatives	15	20.27
Friends	11	14.86
On Campus Events	9	12.16
In person experiences and interactions	8	10.81
Teachers	6	8.11
Social Media	5	6.76
Spoken Stories	4	5.41
Presentations	4	5.41
The Internet/Websites	3	4.05
Guidance Counselors	2	2.7
Fliers	2	2.7
Other	2	2.7
Radio	1	1.35
Television	1	1.35
Vlogs/Podcasts	1	1.35

Note. Participants were able to select as many as applicable

Discussion

Due to the small sample size, caution should be used when interpreting the results. It is not generalizable beyond this study. However, it does open the door for similar studies to be done with larger samples. This also shows the need for a more in-depth exploration of social media's impact on enrollment decisions, especially since participants felt they were not influenced but others were influenced by university social media efforts. Overarching findings from this study support the idea that Chapman's (1981) model is still relevant to this day and

deserves further exploration to make it more applicable to today's universities social media marketing strategies.

For this study, objective one sought to determine where students had seen the university marketed prior to enrollment. It was determined the five most common ways students were made aware of the university were through social media, word-of-mouth, friends, teachers, on-campus events, and family/relatives. This study supports the idea that Millennials are more likely to prefer information from their peers and friends (Nimon, 2007). The high prevalence of social media and on-campus activities support Chapman's (1981) discussion on how a university's own efforts to communicate with prospective students influence students' enrollment decisions. Some recommendations for university social media practice include having student "day in the life" take-over days, concise posts with pictures and videos highlighting past and upcoming events, and easy to follow "how-to" tutorials on applying for enrollment, scheduling a visit, and contacting faculty/staff with department questions.

Objective two sought to determine to what extent social media marketing influenced students' enrollment decision. The participants disagreed that social media impacted their enrollment decision. This aligns with Kelly's (2013) previous findings that some students may not view social media as a source of information, but a place to interact with friends. The participants strongly believed social media campaigns affect other prospective students' enrollment choices, but not their own. They also found South Dakota State University social media marketing campaigns to be informative and agreed that their knowledge of the university had increased prior to enrolling due to marketing efforts, which is consistent with previous research by Chapman (1981). Future research should be conducted with a larger sample to determine the extent social media marketing influences students' enrollment decisions at different universities and programs at those institutions.

Objective three sought to determine what factors influenced students' enrollment. It was determined that family/relatives were the most frequent influences on the decision to enroll followed closely by friends, attending on-campus events, and in-person interactions and experiences. This supports Lipka's (2009) findings of the importance of on-campus visits and events. The influence of family/relatives, friends, and teachers aligns with the signification persons construct in the student choice framework (Chapman, 1981). Universities should focus on building relationships with secondary teachers. The most common influences on enrollment decisions were family/relatives, on-campus events and friends, while the most common factors that helps raise university awareness also included social media and word-of-mouth or in person interactions and experiences. This supports both Witt and Caldwell's (2018) findings that Generation Z is an impressionable group of prospective students that uses social media as a means of comparison and Nimon's (2007) findings that Millennials are critical consumers and are more likely to better receive information from their peers and friends. Social media has become a large portion of potential students' lives making it important for universities to reach out to them using that platform.

One recommendation for practice includes offering more on-campus and interactive experiences for prospective students and their family and friends. These opportunities should be marketed through social media accounts. Another recommendation for practice is that

universities focus on providing teachers, friends, and family/relatives of prospective student's easy access to all university social media sites with updates and information about upcoming events and interactive opportunities. A recommendation for future research is repeating the same study on a larger scale of students from different majors and colleges and determining which posts garner the most attention informing other universities on whether their social media campaigns are effective in recruitment of students.

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Fostering Career Readiness Among Secondary Students: Understanding Teachers' Perceptions of Career Readiness

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Introduction

The expectation that all secondary school graduates are college and career ready is growing in acceptance across the United States (Conley, 2010; English, Cushing, Therriault, & Rasmussen, 2017; Mishkind, 2014). Preparing secondary school graduates for their future careers has long been a goal of agricultural education, and more broadly all of Career and Technical Education (CTE) (ACTE, 2020). Even though the methods by which career readiness instruction is embedded within agricultural education and CTE provide a useful model to follow within mainstream education, current policies which call for the integration of career readiness development within secondary schools are broad and inconsistent across the country (Mishkind, 2014). It is possible the unclear and inconsistent language used to describe these policies hinders the effective implementation of career readiness instruction in secondary schools (Spillane, Reiser, & Reimer, 2002). For example, when policies are ambiguous, teachers' understanding of the policy, and consequently how they adopt and implement the policy, has the potential to vary greatly from one teacher to another. Ultimately, how teachers perceive of a school policy impacts how that policy is successfully adopted into their classrooms (Spillane et al., 2002).

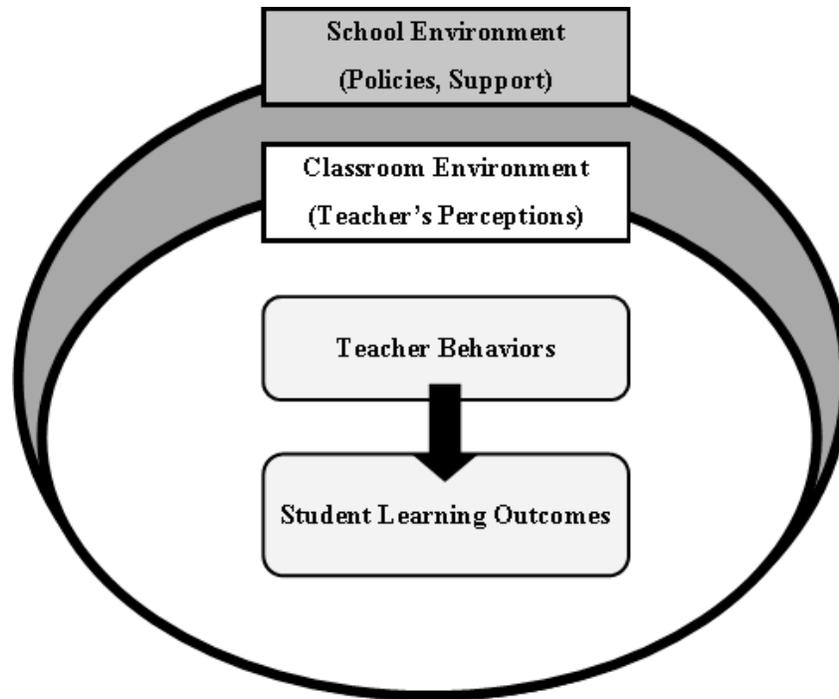
In regard to career readiness policy it is largely undocumented how teachers perceive of career readiness as an outcome of secondary education. In most cases, teachers are the gateway to what is effectively taught to their students. Even if subconsciously, teachers' attitudes and beliefs towards a subject impact the way they make daily instructional decisions (Spillane et al., 2002). Simply setting educational policy does not guarantee successful fulfilment of policy as each teacher plays an instrumental role in the transformation of policy and curriculum expectations into student outcomes. Therefore, the first step towards more consistent implementation is understanding the current perceptions of secondary teachers regarding career readiness as an outcome of secondary education.

Framework

Student learning is directly impacted by teachers' behaviors; an assertion that is supported by a number of learning theories (Atkinson & Schifrin, 1968; Kolb, 1984). The researcher-developed model in Figure 1 acknowledges the role teachers play in the achievement of student learning outcomes. The figure also recognizes teacher behaviors and the resulting student learning outcomes are nested within a classroom environment that is impacted by individual teacher's perceptions (Deemer, 2004). Further, the classroom environment, and consequently teachers' perceptions, exist within the greater school environment, which are impacted by policies, school leadership, and professional development (Aldridge & Fraser, 2016, Wang & Degol, 2016).

Figure 1

Career Readiness Development Model



Purpose and Objectives

This study sought to describe teachers' current perceptions of career readiness as an outcome of secondary schools. Additionally, the study sought to explore how selected teachers' demographic characteristics impacted their perceptions of the importance of and responsibility to teach career readiness. To guide these purposes, the following research objectives were developed:

1. Describe teachers' perceptions of career readiness as a student educational outcome of public K-12 schools.
2. Describe the impact of selected teacher characteristics (years of teaching experience, content area taught, method of earning licensure, policies in place at the school, and professional development opportunities) on their perceptions of career readiness.

Methods

The target population was secondary school teachers in North Dakota, which was estimated to be 3,820 (*N*). The study employed a one-measurement cross-sectional survey design (Cohen, Manion, & Morrison, 2011) where an invitation to participate in the web-based questionnaire was sent to a census of all licensed high school and middle school teachers in North Dakota via email during April 2020. Nonresponse bias was evaluated by comparing the

first 250 respondents to the last 250 respondents using an independent samples *t*-test and no significant differences existed between the groups.

A total of $N = 1,689$ surveys were completed. Two surveys were removed for response set and 480(n) surveys were removed for being incomplete, leaving $N = 1,209$ useable surveys (32% response rate). Among the retained surveys, 4(n) surveys were missing some of the demographic data, making them unusable for some further analyses.

The Perceptions of Career Readiness Instrument (PCRI) was developed by the researcher specifically for this study. Development of the instrument was guided using by selected definitions of career readiness (ACTE, 2010; Conley, 2012; Mishkind, 2014). A panel of five faculty experts and two secondary school teachers ($n = 7$) reviewed the instrument for content validity. The instrument was subjected to an exploratory factor analysis and reliability was found to be $\alpha = .915$. The final instrument included a total of 12 five-point Likert-type scaled items ranging from strongly disagree to strongly agree. The final section of the instrument included eight demographic questions, the inclusion of which were supported by previous research (ACTE, 2020; Aldridge & Fraser, 2016; Hammerness et al., 2005; Mackelvie & Varrato, 2017; Wang & Degol, 2016).

Descriptive statistics were calculated for objective one and objective two was assessed using a series of one-factor between subjects ANOVAs to assess the impact of the demographics (IV) on teachers' perceptions of career readiness (DV). An independent samples *t*-test was used to assess the impact of teachers' method of earning their licensure (IV) on their perceptions of career readiness (DV) because there were only two groups (traditional licensure and alternative licensure). The necessary assumptions of normality, homogeneity of variance, and independence were met. Gabriel's pairwise test procedure was used to conduct post hoc tests due to the unequal sample sizes between groups (Field, 2013).

Table 1

Perceptions of Career Readiness Instrument Items

Item Stem
It is my job to teach career readiness skills.
It is appropriate for me to spend time during my class(es) to instruct career readiness skills.
Fostering career readiness is an important part of my job.
I believe it is important to address career readiness development during my class(es).
Career readiness should be assessed during high school.
It is my goal to prepare students for their future careers.
I am equally responsible for teaching academic content and career readiness skills.
Public high schools must play a role in preparing students for their future careers.
Students must possess basic career readiness skills when they graduate from high school.
All students must receive instruction related to career readiness during middle/high school.
Time in school should be dedicates to the instruction of career readiness skills.
Students should be career ready when they finish high school.

Description of Respondents

Descriptive statistics were used to analyze demographic information of the respondents. The majority of respondents were early career teachers with zero to ten years of experience ($n = 538$, 44.5%). Core academic teachers made up 58% of the respondents ($n = 701$) and Career and Technical Education teachers made up 20% of the respondents ($n = 242$). An overwhelming majority of teachers in the sample earned their teaching license through a traditional teacher education program ($n = 1,130$, 90.1%). Table 2 includes additional demographic information.

Table 2

Demographic Characteristics of Participating Teachers (N = 1,209)

Variable	<i>n</i>	%
Years of Experience		
0-5 years	276	22.8
6-10 years	262	21.7
11-15 years	167	13.8
16-20 years	150	12.4
21-25 years	117	9.7
26-30 years	110	9.1
31 or more years	126	10.4
Missing	1	0.1
Content Specialty		
Core Academics	701	58.0
CTE	242	20.0
Special Education	86	7.1
Other	180	14.9
Licensure		
Traditional Licensure	1130	90.1
Alternative Licensure	75	5.9
Missing	4	0.3
Engagement in Professional Development		
0 workshops/trainings attended	263	21.8
1 workshop/training attended	190	15.7
2 to 4 workshops/trainings attended	446	36.9
5 or more workshops/trainings attended	306	25.3
Missing	4	0.3
All teachers are expected to incorporate skills		
1-3 skills are expected	158	13.1
4-8 skills are expected	521	43.1
9 or more skills are expected	427	35.3
No skills are expected	99	8.2
Missing	4	0.3
Schools assess skills		
1-3 skills are assessed	305	25.2
4-8 skills are assessed	502	41.5
9 or more skills are assessed	194	16.0
No skills are assessed	204	16.9
Missing	4	0.3

Findings

In general, secondary teachers in North Dakota had positive perceptions of the importance of and responsibility to teach career readiness as a secondary school outcome ($M = 4.18, SD = .53$). The means of the demographic groups used for further analysis are found in Table 3.

Table 3

Perceptions of Career Readiness by Demographic Group

Variable	<i>M</i>	<i>SD</i>
Content Specialty		
Core Academics	4.10	.53
CTE	4.48	.45
Special Education	4.43	.47
Other Content Area/Elective	4.05	.54
Engagement in Professional Development		
0 workshops/trainings attended	4.09	.55
1 workshop/training attended	4.08	.49
2 to 4 workshops/trainings attended	4.20	.52
5 or more workshops/trainings attended	4.29	.54
Schools assess skills		
1-3 skills are assessed	4.15	.51
4-8 skills are assessed	4.17	.55
9 or more skills are assessed	4.31	.50
No skills are assessed	4.11	.55

Note. The PCRI used a 5-point Likert scale using the descriptors 1 (*strongly disagree*), 2 (*disagree*), 3 (*neither agree or disagree*), 4 (*agree*), and 5 (*strongly agree*).

The results of the ANOVAs (Table 4) indicate there are significant differences in the means of perceptions of career readiness among groups of teachers based upon the content area they teach, the number of workshops attended, and school policies in place regarding the number of skills teachers are expected to teach and assess. The omnibus *F* test for years of experience was not statistically significant, meaning there were no notable differences in teachers' perceptions of career readiness based upon their years of experience. In order to understand specific group differences, a post hoc analysis was conducted. The results of the significant post hoc analyses can be found in Table 5.

The omega squared values indicate there is a small association (1% to 2%) between the demographic characteristics of school policies regarding the instruction and assessment of employability skills, as well as engagement in professional development, and teachers' perceptions of career readiness. Nine percent of the total variability in perceptions of career readiness can be attributed to the content area taught, which is a medium effect size and the most meaningful difference identified in this study.

Table 4

Association Between Teacher Demographic Characteristics and Perceptions of Career Readiness (N = 1,209)

Demographic Characteristic	<i>df</i>	<i>F</i>	ω^2	<i>p</i>
Years of Experience	6, 1201	2.09	.01	.052
Content Area Taught	3, 1205	40.27*	.09	.000
School Policies: All Teachers Expected to Teach Skills	3, 1201	4.42*	.01	.004
School Policies: Assessment of Skills	3, 1201	5.50*	.01	.001
Engagement in Professional Development	3, 1201	9.84*	.02	.000

Note. * indicates significant *p*-value (<.05).

Upon conclusion of the post hoc analysis, the pairs of groups which were found to be significantly different ($p < .05$) for content area taught include: core academic teachers and CTE teachers, core academic teachers and special education teachers, other content area teachers and CTE teachers, and other content area teachers and special education teachers.

Only one comparison was significantly different based upon policies in place at the school regarding the instruction of employability skills, which was the group of teachers expected to teach nine or more skills compared to the group of teachers expected to teach four to eight skills. When considering the difference between groups based upon the policies regarding the assessment of employability skills the comparisons between schools requiring the assessment of nine or more skills were significantly different than all of the other groups, including no assessment of employability skills, assessment of one to three skills, and assessment of four to eight skills.

The significant pairwise comparisons based upon professional development include: teachers who attended five or more workshops or trainings and both teachers who attended one workshop or training, as well as teachers who did not attend any workshops or trainings. Further, there were significantly different means between the groups of teachers who attended two to four workshops or trainings and both teachers who attended one workshop or training, as well as teachers who did not attend any workshops. Additionally, there was a statistically significant difference between the means of those teachers who were required to attend workshops or trainings and those teachers who sought out the opportunity to attend the workshops or trainings.

An independent samples *t*-test was used to examine the difference between the means of the two groups based upon how teachers earned their teaching license. On average, teachers who earned their license through alternative methods had significantly higher means of perceptions of career readiness ($M = 4.33$, $SE = .074$) than their peers who received their license through a traditional teacher education program ($M = 4.17$, $SE = .016$) ($t(1203) = -2.49$, $p = .013$). Cohen's *d* was calculated and found to be 0.30, which is a small effect size (Field, 2013).

Table 5*Significant Pairwise Comparisons Between Groups Regarding Perceptions of Career Readiness*

Comparison between groups		ΔM	SE	p
Group 1	Group 2			
CTE	Core Academic	.384	.038	.000
	Other Content Area	.431	.050	.000
Special Education	Core Academic	.223	.058	.000
	Other Content Area	.270	.067	.000
All teachers expected to teach 9 or more skills	All teachers expected to teach 4-8 skills	.125	.035	.002
9 or more skills are assessed in the school	No skills are assessed in the school	.200	.053	.001
	1 to 3 skills are assessed in the school	.162	.049	.005
	4 to 8 skills are assessed in the school	.142	.045	.007
5 or more workshops or trainings	No workshops or trainings	.205	.044	.000
	1 workshop or training	.213	.049	.000
2 to 4 workshops or trainings	No workshops or trainings	.113	.041	.033
	1 workshop or training	.121	.046	.041

Note. ΔM = Mean difference.

Discussion/Recommendations/Implications

The purpose of this study was to describe teachers' perceptions of career readiness. Based upon the results, we can comfortably acknowledge that most teachers in North Dakota agree fostering career readiness should be an outcome of secondary schools. Though there were some teachers who had negative perceptions of career readiness, the findings indicate the majority of teachers appear to have embraced the idea that preparing students for their future careers is an important secondary school outcome.

The results of the study confirm the assumption that CTE teachers would have more positive perceptions of career readiness than core academic teachers and other content area teachers. The largest effect ($\omega^2=.09$) identified in this study was the impact of content area taught on perceptions of career readiness. Even though changing content areas is not a simple remedy for changing a teachers' perceptions of career readiness, the medium effect size may highlight an underlying philosophical or pedagogical difference between CTE/Ag Ed and core/other academic area teachers. It is logical that CTE teachers, particularly agricultural education teachers, would be more committed to the development of career readiness among their students since much of their funding is tied to the development of career ready students (Perkins Collaborative Resource Network, 2020), program quality is assessed based on the inclusion of career development opportunities (National Council for Agricultural Education, 2016), and career focused experiences are embedded into the curriculum through Supervised Agricultural Experience (National Council for Agricultural Education, 2015). Agricultural education and CTE

teachers are the school-wide experts in career development and should be utilized as a resource as school leaders and policy makers work to expand career readiness instruction schoolwide.

According to the independent samples *t*-test, teachers who earned their license through alternative means had more positive perceptions of career readiness compared to their peers who earned their teaching license through a traditional teacher preparation program. Oftentimes alternatively certified teachers enter the teaching profession from industry (Mackelvie & Varrato, 2017) and thus their perceptions are likely to be impacted by their real-world career experience outside of education. As the number of alternatively certified agricultural education teachers grows, it is important to remember how their unique perspectives and experiences can lead all of education forward in the development of career readiness.

Understanding teachers' perceptions only becomes meaningful with action. The results of this study support previous literature and add to the body of understanding that teachers' perceptions can be impacted by school policies and professional development (Aldridge & Fraser, 2016, Wang & Degol, 2016). Though there were a handful of significant differences between groups based upon the number of skills teachers were expected to teach, the overall effect sizes were small to negligible ($\omega^2 = .00$ to $.01$). Yet, there were clear differences between the means of perceptions of career readiness between the group of teachers who taught in schools that assessed nine or more skills compared to all of the other groups of teachers. It is noteworthy that assessment of skills led to a difference in perceptions of career readiness between all groups, whereas instruction of those same skills only led to minor differences. It is possible that assessment of skill development leads teachers to be more intentional with their instruction, feedback, and documentation of skill development, which may lead to more positive perceptions of career readiness overall. We recommend all teachers place their focus on the assessment of employability skills and that policies give priority to the assessment of skills.

Engagement in professional development also had a small, positive association with perceptions of career readiness. Within the context of this study, as teachers attended more workshops or trainings regarding the instruction of employability skills, their perceptions of career readiness became more positive. Making training available regarding career readiness skill development to in-service and pre-service teachers has the potential to positively impact their perceptions of career readiness. In regard to policy implementation, sense-making of policies is driven by teachers' understanding of the policy at hand (Spillane et al., 2002). For effective career readiness policy to be implemented, teachers must have a shared understanding of what it means to be career ready, which could be achieved through professional development. Both the addition of policies related to the assessment of skill development and professional development are feasible steps that can be taken within agricultural education and Career and Technical Education more broadly.

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Integration of Back-up Beepers on Lawn Mowers and Tractors into Three Rural High School Agricultural Education Programs

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Integration of Back-up Beepers on Lawn Mowers and Tractors into Three Rural High School Agricultural Education Programs

Introduction

Properly implementing farm safety procedures is one of the most important steps in reducing the number of farm fatalities and injuries on farms. According to previous research tractor rollover incidents is the leading cause of farm fatalities (Hoy, 2009; Vincent et al., 2019; Schafbuch et al., 2016). To help prevent future fatalities previous researchers have created a safety curriculum that was integrated in school based agricultural education classrooms and found a positive increase in student attitudes and knowledge in relation to tractor rollover safety (Vincent et al., 2019). Another cause of fatalities and injuries with vehicles are backover accidents. Backover is defined as a “crash which occurs when a drivers reverses into and injures or kills a nonoccupant” (Austin, 2008, p. iii).

According to National Children’s Center for Rural and Agricultural Health and Safety’s (2018) a child dies every three days on average. The National Children’s Center also reported that around 33 children are injured in agricultural-related incidents a day and 60% of those occurred when they were not working. One specific type of accident that has been prevalent in children are backover accidents. The National Highway Traffic Safety Administration found that nontraffic, takes place off the highway, backovers killed 221 people and injuries approximately 14,000 on average a year between 2002 and 2006. According to OSHA (2015) one method to reduce backover incidents is to add safety warning devices to farm vehicles such as backup alarms.

Conceptual Framework

Apprenticeship of observation (Lortie, 1975; Mewborn & Tyminski, 2006) states that in pre-service teachers’ observations of their previous teachers have the most effect on pre-service teachers’ ideology not teacher education programs. Traditionally, an apprentice learns from observing a master to learn skills of a trade (Mewborn & Tyminski, 2006). On a farm, youth who are learning the necessary skills to be a successful farmer are called a “farm apprentice” (Sanderson et al., 2010). While youth are learning a task that could be potentially dangerous, the focus is usually on the mastery rather than safety (Schafbuch, 2016). These potentially dangerous learned safety behaviors are passed on if there is not a change in attitude in relation to safety.

Purpose and Objectives

As farm workers young and old continue to be in danger from backover accidents, the importance of an educational model to help inform youth continually grows. The purpose of this pilot study was to examine the change in attitude in secondary agricultural education students regarding their attitudes towards backover accident prevention. A pilot study was designed to determine if the integration of backover accident curriculum and installation of back-up beepers on school equipment would illicit a change in knowledge and attitude in regards to preventing backover accidents. This aligns with AAEE Research Priority Area 2: New Technologies,

Practices, and Products Adoption Decisions (Roberts et al., 2016). Specifically, Research Priority Question one: What methods, models, and practices are most effective in leading change? This study is exploring if this method of curriculum integration and experiential learning can lead to a change in safety behaviors in secondary agricultural education students. This has led to the following objective.

1. Describe secondary agricultural education students level of knowledge on the pre- and post-survey, which were administered during the course of the curriculum.

Methods

Participants

To find potential programs for this pilot study a list of programs that had at least two pieces of agricultural equipment that students used regularly during the school year was created. Schools were contacted to determine if they wanted to participate and three schools agreed. The participating agricultural education programs were located in rural communities and had three or more pieces of agricultural equipment utilized by students on school grounds such as tractors, side-by-side utility vehicles, and zero-turn mowers.

Survey Instrument

A pre/post survey was created to determine if the curriculum effected student knowledge and attitudes related to backover accidents. The surveys consisted of 10 questions related to the students' perceived knowledge of backover accidents, back-up beepers, ability to install back-up beepers, and their beliefs that back-up beepers could save lives. The surveys were sent out to a panel of experts and revisions for wording of a couple questions were made for clarity.

Procedures

Prior to data collection parental consent and student assent were obtained. Before the backover safety curriculum was taught students completed the pre-survey instrument. After the pre-survey was completed, the teachers began teaching the backover safety curriculum with the installation of back-up beepers on and student operation of agricultural equipment. The curriculum was developed to provide quality and consistent instruction by all teachers. The included lessons covered topics such as tractor safety, backover accidents, and installation of back-up beepers.

The associated activities allowed students to experience installation of and using back-up beepers in varying conditions of hearing impairment to simulate various working conditions on a farm. The equipment that the participating programs had did not have any manufacturer ready back-up beepers systems. Therefore programs were supplied with back-up alarms, micro snap switches, electrical wire, wire connectors, in-line fuses, and instructions on how to properly install beepers on three pieces of their equipment. The students also had to create a safety plan that they would integrate into their daily use of their equipment. Once the curriculum was complete and back-up beepers were installed, students operated their agricultural equipment for approximately two to four weeks. Then students completed the post-survey instrument.

Data Analysis

Frequency and percentages were used to describe if students knew someone who was involved in a backover accident. Paired *t*-tests were calculated to compare the pre- and post-survey data. Cohen's *d* was calculated to determine the effect size of the statistically significant ($p \leq .05$) paired *t*-tests.

Results

This sample size for this study was $n = 69$ after removing incomplete sets of student surveys. In this study, 41% ($n = 28$) of participants knew of someone who was involved in a backover accident. The paired *t*-test indicated that several questions had *statistically* significant changes between the pre and post survey on a five point scale as shown in Table 1. There was a significant difference in the scores for the question "How knowledgeable are you about backover accident/injuries with agricultural equipment?" pre ($M = 2.34$) and post ($M = 3.84$). Students also had a significant change related to the question "How knowledgeable are you about back-up beepers on agricultural equipment?" pre ($M = 2.21$) and post ($M = 3.75$). For the question "How much attention do you pay to your surrounding when someone is backing up agricultural equipment near you in class?" had significant change between pre ($M = 3.97$) and post. A significant change with the question "Indicate your level of agreement: Back-up beepers would help reduce the number of backover accidents/injuries around agricultural equipment" pre ($M = 4.13$) and post ($M = 4.60$).

Table 1

Question	Pre		Post		<i>t</i>	<i>p</i>	Cohen's <i>d</i> **
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Knowledge level of backover accidents with agricultural equipment? ¹	2.34	1.06	3.84	0.97	8.31	.000*	1.47
Do you pay attention to your surrounding when backing up equipment? ²	4.11	0.94	4.30	0.89	1.30	.198	
Do you pay attention to your surroundings when someone is backing up equipment? ²	3.97	1.11	4.37	0.82	2.71	.008*	0.20
Knowledge level about back-up beepers on agricultural equipment? ¹	2.21	1.02	3.75	0.97	10.46	.000*	1.54
Could you successfully install a backup beeper? ³	0.26	0.44	0.34	0.47	1.75	.083	

Level of agreement: Agricultural equipment should have back-up beepers. ⁴	4.11	1.03	4.53	0.79	3.05	.003*	0.45
Level of agreement: Back-up beepers would help reduce the number of backover accidents. ⁴	4.13	1.01	4.60	0.79	3.52	.001*	0.50

Note: * $p \leq .05$; ¹ 5=Extremely knowledgeable, 1=Not knowledgeable at all; ² 5=A great deal, 1=None at all; ³ 1=yes, 0=no; ⁴ 5=Strongly agree, 1=Strongly disagree; Cohen's *d* effect size: 0.20=small, 0.50=medium, 0.80=large.

Conclusions and Recommendations

This study found that the backover curriculum and installation of back-up beepers had a positive change in students' attitudes regarding backover accidents. Students had a higher perceived level of knowledge of backover accidents and back-up beepers on agricultural equipment. This may be because they have never received any specific instruction on backover accidents before. This could also be caused by observing the use of unsafe practices with agricultural equipment and not knowing they were unsafe practices (McCalum et al., 2006). This may be because the behavioral beliefs changed since the consequences of backover accidents were learned. This change could have impacted the students' control beliefs knowing they can install a back-up beeper on equipment to prevent/reduce accidents. Changing the Apprenticeship of Observation is a difficult challenge (Lortie, 1975), however these preliminary results have shown a shift in secondary agricultural education students' mindsets.

This study needs to be replicated to determine if the results are reliable. It is recommended to incorporate more agricultural education programs from different states. It is also recommended to revise and expand the curriculum to further enhance the learning opportunities for the students. The pre- and post- surveys need to be revised to include more questions related to the students' experiences that would relate to a deeper understanding in the theory of Apprenticeship of Observation. A longitudinal study could be conducted to examine if students transfer the safety knowledge to different aspects of their personal lives such as farm work, yard work, or operating any motor vehicles beyond the school grounds.

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**The Interdisciplinary Lesson Planning Process of Preservice Agriscience Teachers:
A Case Study**

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Introduction

Persuading preservice teachers to recognize the importance of instructional planning and helping them become effective instructional planners is an essential role teacher preparation programs play in the development of future educators (Baylor & Kitsantas, 2005). In 2008, Greiman and Bedtke noted limited research existed with regard to the instructional planning process during teacher preparation. Additionally, the American Association for Agricultural Education outlined the need for meaningful, engaged learning in all environments in Research Priority #4 (Roberts, Harder, & Brashears, 2016).

Interdisciplinary teaching and learning research through the lens of school-based agricultural education (SBAE) programs and the incorporation of science and math in the curriculum is ongoing (McKim, et al., 2018; Pauley, et al., 2019). McKim, et al. (2018) explored SBAE teachers' intentions to teach science within agriculture, food, and natural resources (AFNR). Findings suggest that SBAE teachers have a positive attitude toward teaching science in their AFNR courses, but perceived knowledge level was between "somewhat knowledgeable" and "knowledgeable" regarding the science content (McKim, et al., 2018). Additionally, Pauley, et al. (2019) identified that Curriculum for Agricultural Science Education (CASE) certified AFNR teachers generally had a slightly higher perceived science knowledge than non-CASE certified teachers. However, this did not indicate a higher science teaching intention in CASE certified teachers than non-CASE certified teachers. In-fact, non-CASE certified teachers had higher science teaching intentions than CASE certified teachers (Pauley, et al., 2019).

While current research regarding teaching science in AFNR curriculum is ongoing, the literature is silent regarding incorporating social sciences such as communication into AFNR curriculum. This is in spite of the fact that science educators and organizations have explicitly identified communication skills as a requisite competency for scientific literacy in the twenty-first century (National Research Council, 2012). A variety of pedagogical teaching tools and methods have been proposed regarding teaching communication in the science classroom. These include staging class discussions or debates (Driver, et al., 2000) and using case study approaches where students role play to problem solve scientific issues (Sadler, et al., 2007).

In the present study, four preservice teachers worked with a team of faculty to develop communication curriculum and lesson plans to be incorporated into high school AFNR classrooms. The purpose of these lessons was to teach communication skills to students enrolled

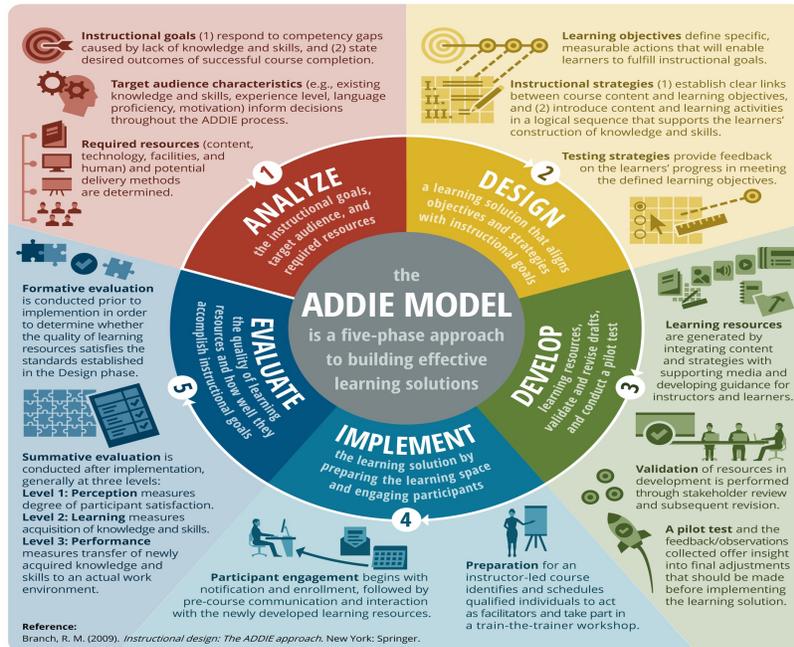
in secondary agricultural education programs in Minnesota to improve their ability to communicate about and advocate for AFNR, increase the communication skills needed to participate in various career and leadership development events (CDE/LDE), and to provide agriscience teachers with tools to train an agricultural communications CDE team.

In order to better understand the interdisciplinary instructional planning process of preservice teachers, one-on-one interviews with the preservice teachers were conducted at the conclusion of their student teaching experience. These preservice teachers worked to develop interdisciplinary lessons prior to their student teaching experience and, when appropriate, used these lessons in their classroom. This qualitative case study examines the interdisciplinary lesson planning and integration process of preservice teachers.

Conceptual Framework

In this study, the lesson planning and integration process was evaluated through the lens of the ADDIE Instructional Design Model. The ADDIE Model is an instructional design model which consists of five steps: Analysis, Design, Development, Implementation, and Evaluation (Davis, 2013). These steps serve as a strategic plan for the lesson planning and implementation processes (Davis, 2013). The ADDIE Model is flexible in its use as a conceptual model. This flexibility was crucial in the analysis of the data set due to the variable nature of student teaching responsibilities and workloads. Forest (2014) stated, “each stage is a clear instruction on its own. This means even if the individual applies ADDIE at the middle of the project, it will still retain its value and be able to provide a sense of structure to the whole program” (p. 1). Figure 1 presents the goals, objectives, strategies, and steps taken during the lesson planning and implementation processes.

Figure 1
The ADDIE Instructional Design Model



Purpose and Research Objectives

The purpose of this study was to describe preservice teachers' experiences during the interdisciplinary lesson planning and implementation processes. The following research objectives guided this study:

- RO1: Describe the interdisciplinary lesson planning process of preservice teachers.
- RO2: Describe the implementation of interdisciplinary lessons in the classrooms of preservice teachers.

Method

Qualitative research was chosen for this study because it allows for an examination and deeper understanding of the experiences and perceptions of participants (Ary, Jacobs, Razavieh, & Sorensen, 2010). This qualitative study was a descriptive intrinsic case study (Grandy, 2012) that sought to understand the particular case of preservice teachers preparing interdisciplinary lessons.

Four preservice teachers were asked to develop 1 – 5 lesson plans for animal science and/or plant science courses. The preservice teachers selected were recruited through a voluntary recruitment call. This call was presented to preservice teachers currently enrolled in the SBAE teacher preparation program at the University of Minnesota - Twin Cities. Only preservice teachers who

would be student teaching the following semester were targeted for recruitment. This decision was made because the preservice teachers would have previously taken courses related to lesson planning and were most prepared for the teaching experience. Preservice teachers selected topics based on their interest areas and developed instructional materials including lesson plans, instructions, activities, and PowerPoints. After developing the curriculum, they worked with an agricultural communication faculty member to incorporate communication principles and activities into the instructional material.

One example of material created aimed to teach plant genetics while also teaching design principles. Students were taught the scientific material associated with plant genetics while also being taught principles of design such as use of white space, fonts, colors, and basic graphic design skills using the free online program, Canva. Upon completion of the unit, students were then assigned to design an infographic using Canva to visually communicate the basic science of plant genetics while using good design principles taught in the lesson.

Upon completion of their student teaching experience, the preservice teachers returned to campus, signed informed consent documents, and participated in individual one-on-one interviews where they discussed their interdisciplinary lesson planning process and, when applicable, discussed the process of using the lessons in their classrooms. Each interview lasted between 15 minutes and 34 minutes. After recorded interviews were completed, interviews were transcribed and pseudonyms were assigned to each participant.

Open and axial coding were used to chunk the data into shared and unique experiences among the preservice teachers. During the coding process, the five steps in the ADDIE Model were used as the guide for the analysis of the data. Direct quotes from each preservice teacher were used to determine how they navigated the lesson planning and implementation process.

We used audit trails to ensure trustworthiness, confirmability, and dependability of the results (MacQueen, McLellan, Kay, & Milstein, 1998). Bias was reduced via the use of debriefing sessions (Guba, 1981). Guided by Lincoln and Guba (1985), transferability was established through the use of detailed quotations in the findings. Findings from this study are limited to the experiences of each preservice teacher and the manner in which these experiences were interpreted. These are common limitations in qualitative research (Pauly, 1991).

Findings

Analyze. During the first step in the lesson planning process, preservice teachers determined their target audience. Evan found he had not analyzed enough to offer adaptations and modifications for his students: “Every single lesson I taught had to have adaptations and modifications for upwards of 12 students out of 24 in one of my classes. So... it's just a whole different world there.”

Kandice also found it difficult to develop lessons for a group of students she had never met.

I think the first thing I came across when writing the lesson was how hard it was to develop a lesson in that vacuum of I don't have the students in front of me to know how I need to structure this to meet their needs.

Design. In the second step of the lesson planning process, the preservice teachers designed learning solutions that align objectives and strategies with instructional goals. Kandice found this to be a new experience for her: “Outside this particular lesson, I don't think I've designed a lesson that is intentionally interdisciplinary to hit other standards.”

DeAngelo, additionally found this step to be challenging despite being a double major in agricultural education and agricultural communication. “I have a pretty decent background in agriculture and a pretty decent background in communication, but I feel like at this point I'm not strong enough in both of them to blend them together.”

Develop. In the development step, preservice teachers identified learning resources and revised drafts. Kandice found working with an agricultural communication faculty member helped with this step.

My lesson was on plant nutrition specifically and trying to find a way to link that to a communication concept was a little more interesting. Working with [Professor] really helped with that because I don't know how I would've come up with that idea otherwise.

DeAngelo found the lesson planning process was beneficial in and of itself. “I think any practice you can get developing lessons or organizing curriculum will only help you. So it gives you new ideas, fresh ideas.”

Implement. Evan had the opportunity to implement a portion of his lesson during his student teaching experience. He felt that the communication content he had originally planned to teach was too much for his student audience, so he narrowed it down to more digestible content.

I used the fact sheet piece from the communications content and then briefly went over principles of design and talking about the rule of thirds and then about some different lines...horizontal and vertical lines and what some of those meant.

Kara used her entire lesson plan, but allowed for some flexibility with her students regarding how they completed the deliverable portion of the lesson.

My lesson is dairy focused, but I gave my students an option to do any species life cycle because we had talked about beef, dairy, and sheep prior to where I stuck in the advocacy lesson because that was before we went out to farm visits.

DeAngelo was limited in his ability to implement the lessons at his school due to technology issues.

I didn't really have as much of an opportunity to integrate the [interdisciplinary] content just because they don't have as much technology at that school and the Chromebooks can only handle so much. And the internet just wasn't very good.

DeAngelo worked to navigate alternative methods to allow his students to develop communication skills. "I was able to do the same thing on a PowerPoint slide and students just duplicated the PowerPoint slide and filled in that information with what they learned in a science experiment they did in my classroom."

Evaluate. The overall goal of the development of these interdisciplinary lessons was to offer agricultural teachers the opportunity to introduce career opportunities in agricultural communication, increase the communication skills of their students for CDEs and LDEs, expose students to and train them for the agricultural communication CDE, and allow teachers to have alternative methods of evaluating student learning after teaching plant and animal science lessons. The four preservice teachers reflected on how these lessons impacted their students and helped meet these goals.

Evan found that because of these lessons, he had increased student interest in both the agricultural communications CDE as well as career opportunities in agricultural communications.

I now have two students interested in ag communications that had never even heard of it as an option before. I even had an opportunity to then talk to them about the ag communications CDE and it was too late for us to have a team this year in Wisconsin, but I found a team of three that is looking forward to doing it next year.

Kandice found the added value of the communications content was beneficial for her students.

Students are going to need those skills of communication and they will probably last longer in the student's [mind] than knowing what nitrogen deficiency looks like. That's not something everyone's going to use every day, but they will use communication.

While reflecting on this experience, DeAngelo found he took for granted the technology knowledge level of his students.

One of the most challenging things was that I kind of expected my students to be at my same level of technology. It's kind of challenging to step back and reteach how to use Google Drive and how to send an email.

Conclusions, Implications, and Recommendations

These preservice teachers had varying experiences throughout their lesson planning process and even more varying experiences regarding their ability to implement and success in implementing the lessons during their student teaching experiences. The ADDIE Instructional Design Model was used as the lens in which the experiences of the preservice teachers were evaluated (Davis, 2013). While the students had more control over the Analyze, Design, and Develop portions of the process, the Implementation process was the most challenging.

Some preservice teachers were limited by technology accessibility and others by the science topic not being relevant to the courses they were teaching. A major conclusion of this study was that all four preservice teachers felt the interdisciplinary lesson development process was rewarding, eye-opening, and a beneficial learning experience. The need to practice and complete interdisciplinary lessons prior to embarking on the student teaching process was highlighted by all four preservice teachers during the interviews. Furthermore, the student teachers found the use of communications as the interdisciplinary component of the agricultural science curriculum as beneficial as it allowed for increased student interest in careers related to agricultural communications, the agricultural communications CDE, and increased their communication skills in the long run. For teacher preparation programs, this research indicates that preservice teachers are interested in and value the interdisciplinary lesson planning process. Preservice teachers want more opportunities to actively develop interdisciplinary lessons, and they believe that teaching technical communication skills in the classroom while tying the skills to the content area can improve student knowledge retention and engagement in the learning process.

Results from this study lays the groundwork for further inquiry into the use of social sciences such as communications as an interdisciplinary component to SBAE curriculum, further building on the work of McKim, et al., 2018 and Pauley, et al., 2019 with regards to AFNR curriculum. Additionally, this research builds on the work of Driver, et al., 2000 and Sadler, et al., 2007 in that it explored communication tools and methods outside of interpersonal communication. Future research should identify how these preservice teachers are using these lessons in their own classrooms as they are now each in SBAE programs. Further qualitative inquiry should additionally investigate how the type of communication tools taught in the classroom impact student engagement, content knowledge, and CDE/LDE participation. Additionally, quantitative

research could allow us to better understand the interest and motivation of current SBAE teachers to implement social science-based interdisciplinary lessons in their classrooms.

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**Relatedness within School-Based Agricultural Education Programs from the Perspective of
the Teacher**

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Introduction

School-Based Agricultural Education (SBAE) has robust experiences to offer students. SBAE teachers are tasked with determining activities to motivate students. Research has demonstrated that motivation is impacted by the relationships and experiences within SBAE (Anderson, 2013; Ball et al., 2016; Bowling & Ball, 2018; Green, 2001; Klassen et al., 2012). SBAE is unique in that there are outside of school activities that connect to classroom learning; therefore, the term “intracurricular” is tied to SBAE activities. National FFA (<https://ffa.org>) states that “FFA is the intracurricular organization for those interested in leadership and agriculture.” Anderson (2013) states, “factors that influence the students’ decision to enroll in the program impacts their motivation” (p. 210). Furthermore, Larson & Kleiber (1993) demonstrated that students would focus on more intrinsic motivation when participating in academic-adjacent activities.

Student motivation is essential, such that Deci (2009) asserts that education is impossible without motivation. Reeve and Halusic (2009) share that teachers can find ways to motivate their students by coordinating instruction with student motivation. Research has recently focused on how motivation is supported within educational settings. Gasser et al. (2018) state that the level of emotional support shown within the classroom allows students to feel safe to engage in the classroom. Quin (2017) demonstrated that secondary student engagement is driven by their connection to their teacher. Furthermore, connections in the classroom are a manifestation of a positive relationship between teacher and student. Add to this research the old adage that “students don’t care how much you know until they know how much you care,” and you’ll find that relationships have always been essential to education. Teachers influence the components that influence student motivation if they share a positive relationship.

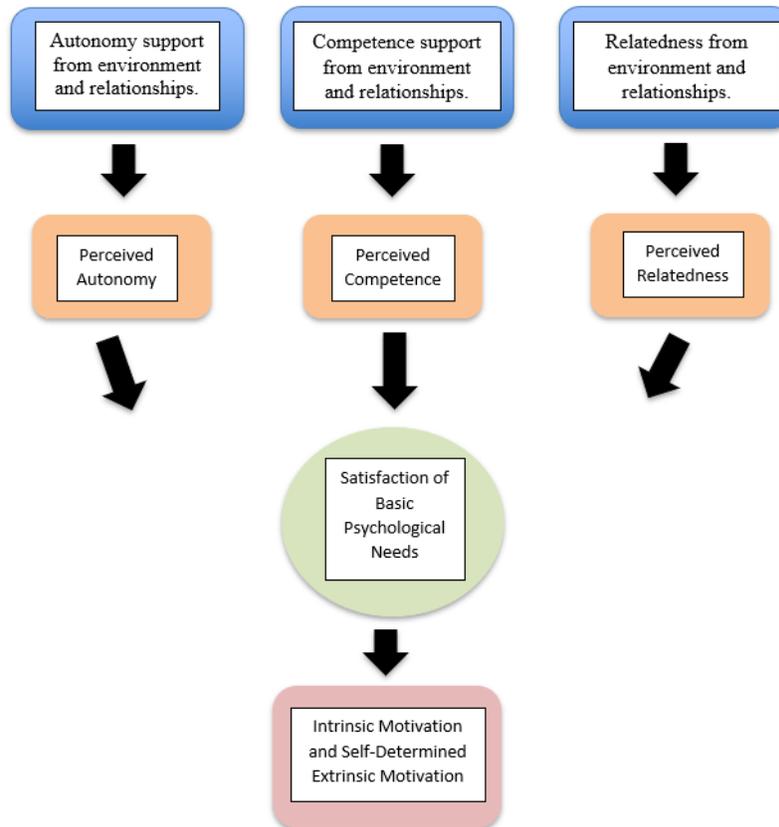
This study aims to explore the beliefs that agricultural educators hold about relatedness within SBAE programs and how their beliefs influence the strategies utilized to build relatedness. This study aimed to learn about the specifics of how relatedness manifests itself within the SBAE program each teacher advises. This topic has not been directly addressed within SBAE research (Anderson, 2013). Specifically, this study aims to examine student motivation as a byproduct of positive relatedness within SBAE.

Theoretical Lens/Philosophical Perspective

We utilized a constructivist philosophical perspective and theoretical lens of Self Determination Theory (SDT). SDT has three universal needs: relatedness, autonomy, and competence. SDT posits that individuals must have a high level of relatedness, autonomy, and competence to feel motivated (Deci, 1991). Relatedness is defined as a sense of belonging within a context (Deci, 1991). Ball, et. al. (2016) shared that motivation is the driving force for student engagement in SBAE programs.

Figure 1

SDT Model (Legault, 2017)



The constructivist philosophical perspective allowed the team to bracket their bias. To bracket bias, the research team evaluated the first few interviews together to compare assessment and to ensure no bias was evident in the data analysis of the teacher interviews. Furthermore, this effort was maintained throughout the data analysis of the entire research project. Data emerged from this perspective by using interview responses to deduce the philosophies that drive them as a professional. SDT provided a lens in which to frame the relationships within an SBAE program. This lens allowed us to interpret the perceptions of SBAE teachers based on what they choose to use as strategies to build connections with students. The research team consisted of two former high school SBAE teachers and current SBAE teacher preparation educators, and one pre-service SBAE teacher.

Purpose and Research Questions

The purpose of this study was to explore the essence of supporting relatedness within SBAE through the exploration of teacher beliefs and strategies. The research questions were:

Central Question:

What is the essence of supporting relatedness within an SBAE program?

Sub-questions:

- 1) What beliefs do SBAE teachers possess regarding relatedness within their programs?
- 2) What strategies do SBAE teachers utilize to build relatedness in their program?

Methods

For this study, we utilized a phenomenological methodology (Moustakas, 1994). This study sought to explore the essence of supporting relatedness within SBAE programs. The essence of relatedness was communicated through the perception of the teacher.

To identify potential participants, we contacted three Ohio Department of Education Agricultural Education supervisors and one Agricultural Education teacher preparation faculty member to identify SBAE teachers who taught for a minimum of five years, were believed to support relatedness and represented a variety of demographic characteristics. From their recommendation, we purposively sampled teachers during the 2019 school year. Eight Ohio teachers ($n = 8$) responded to the invitation to participate in the interviews. Of the teachers interviewed, the majority were female ($n = 5$). The sample consisted of teachers who had a range of years of service from 6 years to 21 years ($M = 11.75$, $SD = 4.84$). The teachers who participated serve different populations: urban ($n = 2$), suburban ($n = 1$), and rural ($n = 5$). The teachers were geographically diverse: central ($n = 1$), western ($n = 3$), northwest ($n = 1$), north-central ($n = 1$), and south-west ($n = 1$). 50% ($n = 4$) of the teachers taught in a single-teacher SBAE program. Most of the teachers who participated in this study received a “traditional” license ($n = 6$).

We collected data through semi-structured, one-on-one video-conference interviews. The interview questions were developed using SDT as a lens. The 45-60-minute interviews were conducted and recorded via Zoom. The recording was transcribed verbatim by team members. After six interviews, the team believed data saturation was reached, as many of the interviewers provided similar answers. To ensure that saturation was achieved, two additional interviews were conducted. Data were analyzed through the phenomenological techniques of horizontalization, identification of meaning units, and clustering of themes (Moustakas, 1994). No differences were identified during the horizontalization between each interview. Next, meaning units were identified by clustering themes from each interview. Then clustered themes were placed into common themes. After this analysis was completed, one of the teachers was selected for the member check process to ensure validity and reliability. Trustworthiness was held through continuous group meetings. The team followed recommendations provided by Lincoln & Guba (1985) about constant communication, so everyone was aware of the study direction. We utilized triangulation from Lincoln & Guba (1985) to ensure that all data was considered valid by each member. Communication occurred within the team to eliminate bias. Finally, each team member kept transcripts of the interviews they conducted, for future review per Lincoln & Guba (1985).

Findings

From the data analysis, four themes emerged: the SBAE program has a welcoming “culture,” engagement drives relatedness, agriculture teachers are role models, and teamwork is tied to developing relatedness.

Theme 1 – Welcoming “Culture”

The first theme that emerged was a “culture” built on relatedness. All of the teachers viewed relatedness as the foundation for their program’s culture. Cheryl described her program’s culture as, “many students within my program don’t have any other place to fit in at school; ag class and FFA serve as their ‘school family’ and that environment becomes the shared culture.” Cheryl stated that the program activities and courses she offers allow students to find something of interest. She discussed how many of the students are friends outside of her program and have become close due to activities within her program. All of the teachers in the study used words like “family environment” and “welcoming” as words they use to describe the way that they perceive their program feels for their students. At the most basic level, each teacher recognized that the culture of their program must be appropriate for their students in order to encourage relationship building and engagement.

Theme 2 - Engagement drives Relatedness

The second theme that emerged was that engagement is key to relatedness; this includes relationships between teachers, students, and stakeholders. Engagement occurs between the teacher and among students in the classroom each day. That engagement, if positive, can lead to students engaging outside the classroom. Bob stated that he could find out what students are interested in by having conversations as a part of selecting their Supervised Agricultural Experience. Bob used an example of a student who he had a relationship with but over time; they realized they both enjoyed showing poultry. Their relationship led Bob to advise the student on college decisions. Now Bob helps him get jobs to judge fair competitions. The engagement with students can allow teachers to become a long-term mentor. Each of the study participants had similar stories to the one Bob shared.

Each teacher talked about school administrator impact on program relatedness. Marie talked about how her principal approached her in front of students to talk about program issues. This was one of the examples of ways that administrators can thwart relatedness. The teachers all recognized that the relationship between an administrator and the SBAE program must be civil as administrators are program partners who can easily influence relatedness.

Theme 3 – Teachers are Role Models

The third theme that emerged was that agriculture teachers are the role models of relatedness. The teacher must model respect, care, and expectations for their students. All the teachers discussed how they perceive that their students look up to them. Tammy discussed how early on in her current position that her students brought her questions that she would label personal, “parent” questions. She attributed this to a societal gap in relationships between some students and their guardians.

Each teacher discussed how they prefer to utilize classroom management that has the “workplace” level of respect while offering support to help keep students on task. SBAE programs allow for the “workplace” environment, which can serve as a platform for building relationships. Additionally, many of the teachers shared with us that over the years, students

share with them how much the guidance and support meant to them. Each teacher acknowledged that essentially they provide their students guidance as a role models in many different ways; several strongly believe they were one of the few teachers to serve students in this way.

Theme 4 - Teamwork is tied to Developing Relatedness

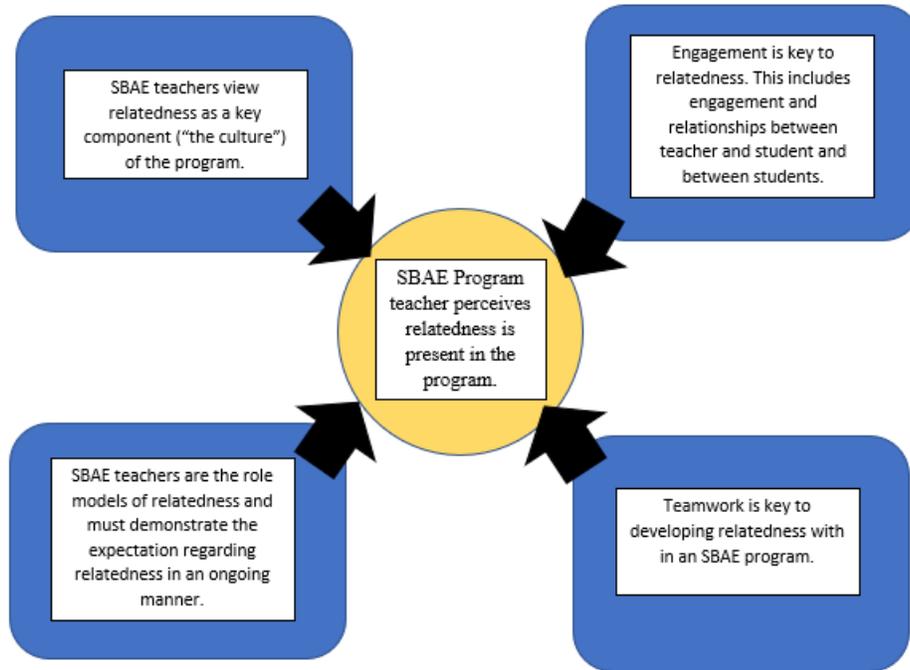
The fourth theme that emerged was that teamwork is key to developing relatedness. The teachers felt that this meant that their students enjoy working together and that working together makes students feel more comfortable within their program. Bob stated, “I try to get teams of students working together, like my FFA Officer Team.” Bob and his students face a challenge, though; it can take some convincing to get students to leave their comfort zone and work with new people. The majority of teachers recognized the importance that teamwork played in student relationship development and student engagement in the program. It could be asserted that if you can achieve that, you are on your way to increasing your program relatedness. Teachers need to seek out intentional ways to allow this teamwork to happen, such as retreats, competitions, planning events, and class projects.

Discussion

Research has demonstrated that motivation is impacted by the experiences within their SBAE program (Anderson, 2013; Ball, et al. 2016; Bowling & Ball, 2018). This study supports this statement. From these findings, we discerned that relatedness is essential within SBAE from the perception of teachers leading programs. The themes derived from this study demonstrated that relationships in SBAE drive relatedness, which reinforced the findings from Gasser et al. (2018), which state that the level of emotional support shown within the classroom allows students to feel safe to engage in the classroom. Furthermore, the finding reinforces what Reeve and Halusic (2009) found that teachers can find ways to motivate their students by coordinating instruction with student motivation. SBAE teachers provide this to students through their engagement with them in and through the program. Finally, this study also supported Quin (2017), which demonstrated that secondary student engagement is driven by their connection to their teacher. The findings of this study demonstrate that relatedness between teachers and students in SBAE might be the strongest way that relatedness is built. Teachers serve as role models for students, and teachers learn a great deal about students through engagement in the program. Knowing student interests is essential for student engagement. This highlights the importance of SBAE teachers keeping students at the center of their decisions. Teachers perceived that serving as a role model was key to relatedness with students. The themes that provide this support that was discovered in this study are mapped in Figure 2.

Figure 2

Perceptions of SBAE Teacher Beliefs about Program Relatedness



From this study, we recommend that teachers intentionally create relationships with their students. This can be accomplished by finding ways for one-on-one conversations with students in the program, such as having meetings with students to identify their SAE. Teachers must promote students to have relationships within themselves and with stakeholders. This can be accomplished by encouraging teamwork through class pedagogy choices and by inviting students to attend community meetings, like the program Advisory Committee meeting, to expand their network. The teachers perceived that they provide guidance to students that would usually be provided by a guardian. Being open to, in a reasonable way, supporting students through informal mentoring is one way to make this possible in your program. Many of the teachers who participated in this study discussed their SBAE program as a place where students feel welcome. Welcoming environments can be constructed by offering programming and classes in which students can see themselves participating.

Further inquiry into the impacts of teacher strategies on relatedness in SBAE programs is needed. Are these perceptions shared by a larger population of teachers? Do students agree with these perceptions? This study opened the door to examine more aspects of relatedness within SBAE programs.

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The (Re)Naming of 1862 Land-Grant Institutions as an Act of (Re)Branding Over Time: A Historical Account

Audrey E. H. King & M. Craig Edwards

Introduction

A brand's purpose, vision, and values contribute to achieving the mission of the entity it illustrates and promotes (Franzen & Moriarty, 2009). A brand, as transmitted by and through an entity's name, is operationalized as a "complex, interrelated system of management decisions and consumer reactions that identifies a product (goods, services, or ideas), builds awareness of it, and creates meaning for it" (Franzen & Moriarty, 2009, p. 6). A brand cannot be understood independent of the world or context in which it exists. This study focuses on a seminal aspect of the rebranding of 1862 land-grant institutions (LGIs) over time, i.e., an account of their *naming* and *renaming*.

University Identities

Drori (2013) defined a brand as "artifacts that uniquely identify the organization . . . [and] convey the personality of the particular university" (p. 3). Brands and the names that promote them are of utmost importance to the success of universities in an ever-changing consumer climate (Drori, 2013; Drori et al., 2013). The rising competition and cost associated with higher education cause scrutiny among universities' customers, including students and other stakeholders. Therefore, traditional branding or identity management strategies may not suffice (Argenti, 2000). Moreover, universities have a unique opportunity to brand through the architecture of buildings, design of campus landscapes, and general ambience (Drori et al., 2013). These elements, in addition to webpages, mascots, apparel and other merchandise, help create and sustain a university's unique or distinctive presence among its stakeholders, competitors, and wider society.

Public Identity LGIs

The Association of Public and Land-Grant Universities (APLU, 2019) stated that "[a] land-grant college or university is an institution that has been designated by its state legislature or Congress to receive the benefits of the Morrill Acts" (para. 1). A recent study, however, found that "the public at large has little understanding of how universities contribute directly to the well-being of communities, let alone understanding the more specific definition of what it means to be a land-grant institution" (Gavazzi & Gee, 2018, p. 29). Nonetheless, Sternberg (2014) noted that "[LGIs] are one of the most precious if not always most highly visible resources this nation has" (p. 1).

Although the tripartite mission of LGIs was established by a series of federal legislative acts, the application of the corresponding federal statutes differs from state to state (Campbell, 1995; Gavazzi & Gee, 2018; Sternberg, 2014). Though this variance created challenges insofar as branding, it was necessary and adds unique value to each respective LGI. Gavazzi and Gee (2018) argued that "the minute we try to homogenize our universities, we become more like a

federalized education system, and we lose our luster in the process” (p. 31). As such, individual institutions have differentiated themselves over time, including naming proclivities, which likely supported perpetuating their unique autonomy and singularity.

Purpose/Research Question

The purpose of our larger study was to describe the branding of 1862 LGIs over time. One research question is answered here: 1. How and when were the 1862 LGIs *named* and *renamed* over time and what may that imply about their future branding needs?

Methods

McDowell’s (2002) guidelines for conducting historical research informed our methodology. Cohen and Manion (1994) supported McDowell (2002) and concluded that historical research begins by identifying a study area, creating questions to guide research, collecting, verifying, classifying, and examining data to answer the study’s guiding questions. Primary and secondary sources were gathered through the Oklahoma State University library search tools. Key search terms included combinations of branding, history, image, land-grant, renaming, and university. Records of legislative acts and related documents, university webpages, and government reports served as primary sources. Regarding the institutions’ official presences on the Internet, the lead researcher reviewed the relevant webpages of all 1862 LGIs to identify and verify findings to answer the study’s research question. Secondary sources were books describing the history of LGIs and peer-refereed journal publications. The sources were examined to establish authenticity and accuracy through internal and external criticism, and select findings were triangulated to establish the study’s credibility (McDowell, 2002).

Findings

The Land-Grant College Act or Morrill Act of 1862 became law when signed by President Lincoln during the American Civil War (Morrill Act of 1862, 1862). It was this law that provided the initial funding for each U.S. state or territory to either establish a LGI or support an already existing college in concert with the law’s aims and precepts. In the more than 150 years following their establishment, the land-grant concept and system has undergone many changes, some of which are the renaming of the institutions themselves. When the Morrill Act of 1862 was enacted some states applied land-grant status to already established institutions, e.g., New Jersey and Rutgers University, with the understanding that the institution would offer instruction in agriculture and mechanic arts (Campbell, 1995). Other states created new institutions. Many LGIs have changed their names, some more than eight times and the total number of name changes is 94. Table 1 shows the founding years and different names of the 1862 LGIs over time, and the last year in which their names were changed, if applicable.

Table 1

Founding Years and Name Changes of the 1862 LGIs

Institutions	Years Founded ^a	Former Name(s)	Years of Last Name Changes
Rutgers University	1766	Queen's College; Rutgers College	1925
University of Georgia	1785	N/A	N/A
University of Vermont	1791	N/A	N/A
University of Tennessee	1794	Blount College; East Tennessee College; East Tennessee University	1869
University of Delaware	1833	Newark College; Delaware College	1921
University of Missouri	1839	N/A	N/A
University of Wisconsin	1848	N/A	N/A
University of Minnesota	1851	N/A	N/A
University of the District of Columbia	1851	Miner Normal School; Miner Teachers College; District of Columbia Teachers College	1975
University of Florida	1853	East Florida Seminary; Florida Agricultural College; University of the State of Florida	1909
Pennsylvania State University	1855	Farmers' High School of Pennsylvania; Agricultural College of Pennsylvania; Pennsylvania State College	1953
Michigan State University	1855	Agricultural College of the State of Michigan; State Agricultural College; Michigan Agricultural College; Michigan State College of Agriculture and Applied Science; Michigan State University of Agriculture and Applied Science	1964
University of Maryland	1856	Maryland Agricultural College; Maryland State College	1920
Auburn University	1856	East Alabama Male College; Agricultural and Mechanical College of Alabama; Alabama Polytechnic Institute	1960
Iowa State University	1858	Iowa Agricultural College and Model Farm; Iowa State Agricultural College; Iowa State College of Agriculture and Mechanic Arts	1959
Louisiana State University	1860	Louisiana State University and Agricultural & Mechanical College; Louisiana State University and Agricultural & Mechanical College	1877

Kansas State University	1863	Kansas State Agricultural College; Kansas State College of Agriculture and Applied Science; Kansas State University of Agriculture and Applied Science	1959
University of Massachusetts	1863	Massachusetts Agricultural College; Massachusetts State College	1947
Cornell University	1865	N/A	N/A
University of Maine	1865	Maine State College of Agriculture and the Mechanic Arts	1897
University of Kentucky	1866	Agricultural and Mechanical College of Kentucky	1916
University of New Hampshire	1866	New Hampshire College of Agriculture and Mechanic Arts	1923
University of California System	1866	Agricultural, Mining, and Mechanical Arts College	1868
West Virginia University	1867	Agricultural College of West Virginia	1868
University of Illinois	1867	Illinois Industrial University, University of Illinois	1885
Oregon State University	1868	Corvallis College; Corvallis State Agricultural College; State Agricultural College; Corvallis State Agricultural College; Oregon State Agricultural College; State Agricultural College of Oregon; Oregon Agricultural College; Oregon State Agricultural College; Oregon State College	1961
University of Nebraska	1869	N/A	N/A
Purdue University	1869	N/A	N/A
Ohio State University	1870	Ohio Agricultural and Mechanical College	1878
Colorado State University	1870	Agricultural College of Colorado; Colorado State College of Agriculture and Mechanic Arts	1957
University of Arkansas	1871	Arkansas Industrial University	1899
Virginia Polytechnic Institute & State University	1872	Virginia Agricultural and Mechanical College; Virginia Agricultural and Mechanical College and Polytechnic Institute; Virginia Polytechnic Institute	1970
University of Nevada, Reno	1874	State University of Nevada; Nevada State University; University of Nevada	1969
Texas A&M University	1876	Agricultural and Mechanical College of Texas	1948

Mississippi State University	1878	Agricultural and Mechanical College of the State of Mississippi; Mississippi State College	1958
University of Connecticut	1881	Storrs Agricultural School; Connecticut Agricultural College; Connecticut State College	1939
South Dakota State University	1881	Dakota Agriculture College; South Dakota State College of Agriculture and Mechanic Arts; South Dakota State College	1964
University of Arizona	1885	N/A	N/A
University of Wyoming	1886	N/A	N/A
North Carolina State University	1887	North Carolina College of Agriculture and Mechanic Arts; North Carolina State College	1962
Utah State University	1888	Agricultural College of Utah; Utah State Agricultural College	1957
New Mexico State University	1888	Las Cruces College; New Mexico College of Agriculture and Mechanic Arts	1960
Clemson University	1889	Clemson Agricultural College	1964
University of Idaho	1889	N/A	N/A
Washington State University	1890	Washington Agricultural College and School of Science; State College of Washington	1959
North Dakota State University	1890	North Dakota Agricultural College	1960
Oklahoma State University	1890	Oklahoma A&M College; Oklahoma State University of Agriculture and Applied Science	1980
University of Rhode Island	1892	Rhode Island College of Agriculture and the Mechanic Arts; Rhode Island State College	1951
Montana State University	1893	Agricultural College of the State of Montana; Montana College of Agriculture and Mechanic Arts; Montana State College	1965
University of Puerto Rico	1900	Normal School	1923
University of Hawaii	1907	College of Agriculture and Mechanic Arts in Honolulu; College of Hawaii	1920
University of Alaska	1917	Alaska Agricultural College and School of Mines	1935
University of Guam	1951	College of Guam	1968
University of the Virgin Islands	1962	College of Virgin Islands	1986
College of Micronesia	1963	N/A	N/A

Northern Marianas College	1981	N/A	N/A
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Note. Findings for this table were taken from each LGI’s website. The comprehensive list of 1862 LGIs was taken from APLU (2019). ^aDescending order of institutions was based on year of founding.

Conclusions

LGIs have changed, adapted, and evolved during a long and storied history, which led to their renaming over time (Hankinson et al., 2007). The names of 43 LGIs changed from 1866 to 1986 (see Table 1). These name changes may be attributed to several factors. Many of the schools had the term *agriculture* in their titles. As institutional offerings expanded to include more than agriculture, institutions likely changed their names to be more inclusive. Of note, these changes were in accord with the LGI brand as envisioned by the Morrill Act of 1862 that stipulated humanities or general education courses were not to be excluded from the curriculum (Morrill Act of 1862, 1862). Moreover, some of the institutions changed their names from *colleges* to *universities* as they grew and diversified, which may have been intended to communicate the offering of graduate degrees among other academic advancements. Our results suggest that over time most LGIs renamed themselves presumably to be more appealing to broader audiences and relevant to those not directly tied to agriculture. These changes are reflective of the context in which LGIs exist, i.e., a changing and increasingly less agrarian U.S. society. Franzen and Moriarty (2009) asserted that brands cannot be understood outside of the world in which they exist.

Recommendations

Future research should examine whether the renaming of LGIs were true instances of rebranding, i.e., actual organizational change (Lomax & Maddor, 2006), or rather attempts to be viewed as more inclusive and thereby appeal to more diverse audiences. The effectiveness of such a rebranding strategy warrants investigation. The renaming of 1890 and 1994 LGIs should be studied. Additional research should also focus on the renaming of individual institutions and the expression of that through external marketing and communication channels. We also recommend the study’s findings appear in curricula for courses exploring the history of U.S. higher education institutions, especially regarding LGIs. Our findings may be of interest to agricultural communicators and media specialists and serve as a learning resource for agricultural education, extension, and leadership professionals.

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