

Examining the Implementation of Competition by Minnesota School-Based Agricultural Education Teachers

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Abstract

The purpose of this study was to examine the extent to which school-based agricultural education (SBAE) teachers implement competition within their programs. A quantitative instrument was designed to carry out the four research objectives of the study. The instrument was distributed to a non-probability convenience sample of 72 SBAE instructors who attended the Minnesota agricultural educators' association conference. Data were interpreted and analyzed utilizing descriptive statistics. Teachers tend to have a desire and the skills to implement competition within their classroom, but lack the physical resources, curricular materials, and in some cases, the professional development experiences to implement competition to their desired extent within their classroom settings. Further research is needed in order to more fully explore how we can better support teachers who wish to implement competition within the classroom and the motives teachers have in selecting competitive elements within their classrooms. Further research should also be done to understand how teachers modify curricular resources to meet the goals and desires of their students and their programs.

Introduction

With an eight-hour teaching day and a 180-day contract, a school-based agricultural education (SBAE) teacher has roughly 1,440 hours of paid time on an annual basis devoted to providing their students and community with high quality, systematic agricultural education consisting of the three components of the field: classroom instruction, leadership development and work-based learning (Bolton, et al., 2018; Croom, 2010). An effective school-based agricultural education program is said to have each of these elements present throughout the program, and while they may be evident, they may not necessarily be working in tandem with one another or present in the same proportions (Bolton, et al., 2018; Croom, 2010). With the demands that come with teaching agriculture, educators must be strategic in maximizing instructional value while also facilitating career-readiness opportunities for students through classroom instruction, work-based learning, and leadership development. Integration of the three-component model and competition in the classroom are topics that have been investigated by many (Aldana, 2020; Bowling & Ball, 2020; Çulha, 2021; Jones, & Edwards, 2019; Kowalski & Christensen, 2019; Lamm, et al., 2020), but these topics have not been investigated in tandem with one another through the lens of competition.

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Students in SBAE programs have been actively engaged in different competitions inside and outside of the classroom for many years; in fact, some competitive opportunities even existed before the passage of the Smith-Hughes Act of 1917 (Jones & Edwards, 2019). These competitive opportunities were designed to advance the knowledge of students while also providing them an opportunity to experience something “off the farm” that contributed to the development of leadership skills and was still connected to their interest in agriculture.

For this study, competition can be defined as any event or series of events that results in people attempting to achieve a goal to outperform or exceed an expectation; usually interpersonal in nature (Kowalski & Christensen, 2019). Competition and the Social Darwinism “survival of the fittest” mentality have always been trending at the forefront of the American education system (Dewey, 1900; Johnson & Johnson, 1994; May & Doob, 1937). With the organization of our education system, students have always been competing for grades, recognition, social status, and peer or teacher satisfaction. In addition, different events throughout U.S. history, such as World War II, have shaped the goals and expectations of the education system by placing prioritization on achieving production and results as efficiently as possible with less emphasis on the total learning process (Jones & Edwards, 2019). Kowalski and Christensen (2019) indicated competition in the classroom can have differing effects and impacts on all types of students. Kowalski and Christensen (2019) examined students’ perceived competence in completing a competitive task and their interaction with the stakes of said competition. Competitive events that are considered high stakes, such as college admission or earning the title of valedictorian, weigh differently than events that are considered low stakes, such as comparing grades with their peers. When designing opportunities for competition within a SBAE classroom, creating opportunities that are low-stakes that are supported by a SBAE teacher communicating or reinforcing their belief in their students’ ability to be successful.

As an integral part of the three-component model, many agricultural educators look for ways to encourage and motivate their students to participate in the National FFA Organization (Bolton, et al., 2018; Croom, 2010). Teachers have the option to integrate several elements of career development events (CDE) and leadership development events (LDE) within their curriculum depending on the content area. For example, in the nursery and landscape technology CDE, there are several elements on which students are evaluated, including identification of plant materials and tools, math practicums, customer relations, drawing exercises, and a written exam (National FFA Organization, 2020). An educator could look at the main topics for each of the areas of the competition and integrate many of these elements into an exploratory, floriculture, plant science, or landscaping course as a basis of the curriculum; hopefully as a way to strengthen the program while simultaneously encouraging any interested or top-performing students to try the event (Bowling & Ball, 2020). One way they could integrate the CDE components into their program is through utilizing practicums from previous competitions as class projects where students apply their learning or having weekly plant identification quizzes on a platform such as Kahoot! or Quizizz, using the list of each CDE’s identification items as a basis for the quizzes. This is also supported by the findings of Bowling and Ball (2020), as lower-level memorization skills, such as learning how to identify plants in the nursery and landscape technology CDE within the realms of a plant science class, is a method of still teaching all students an important skill while scaffolding and helping prepare a group of those students who might find themselves interested in trying the CDE.

Literature Review

At this time, there has not been a great deal of published academic research surrounding the integration of competition within the classroom from the same perspective or position this study attempts to unpack, which is connecting competition in the classroom to pedagogical design capacity in an agricultural education program. However, some research has been done regarding competition as an instructional method and the implications it can have on student motivation and learning. Motivation has always been a driving factor in determining student participation and interest, and competition can be one

way to motivate learners. Motivation can take on a variety of forms, but the level to which one is motivated, along with the orientation of that motivation are both important pieces to consider. The level of motivation is simply how driven a person is to complete a task. On the other hand, the motivation orientation can be thought of as a spectrum between extrinsic (external) factors on one end and intrinsic (internal) factors on the opposite end, which is supported by Deci and Ryan's Self-Determination Theory and the Organismic Integration Theory (Ryan & Deci, 2000; Schunk, 2012). Depending on the learner and task at hand, one may find themselves at any point along the continuum—and their location along this continuum can shift freely (Ryan & Deci, 2000). Likewise, SBAE teachers may be motivated to design or modify their curriculum based on their beliefs, resources they have, or as a result of their overall knowledge and comfort level with the content being taught.

While the ultimate goal would be for all learners to be intrinsically motivated where satisfaction can be found within the activity itself, not all learners will be motivated by all activities within a classroom setting. Research shows intrinsic motivation diminishes as students advance through the education system (Ryan & Deci, 2000). Predominantly extrinsic motivators exist in a classroom environment, so it is important for teachers to effectively identify forms of motivation that will engage their students and, whenever possible, encourage them to become more intrinsically motivated by the task over time (Ryan & Deci, 2000). In regards to extrinsic motivators, it has been thought that the rush of winning in a competition, can diminish, or in some cases, completely undermine any intrinsic motivation that may have initially existed and lead to unhealthy competition (Kohn, 1992). Unhealthy competition creates environments that are high-stakes for students and cause a short- or long-term impact on winners and losers. Shindler (2009) cites several concerns with implementing competition into the classroom, including fostering fear of failure and increased anxiety among all students. When competition is implemented, educators should ensure that it is healthy competition and express extreme care in ensuring students are not losing sight of learning (Kohn, 1992; Shindler, 2009).

From a programmatic standpoint, there are benefits of integrating CDE and LDE competitions within a classroom setting. There has been some research completed on teachers' perceptions of the outcomes of participating in CDE and LDE competitions (Bolton, et al., 2018; Bowling & Ball, 2020; Goodwin & McKim, 2020). When looking at the philosophy of participation in FFA competitive events, there are three key classifications of why a teacher would wish to encourage students to engage: 1) to provide an extension of classroom learning, 2) competition and achievement, or 3) to provide opportunities for student development. Among a study conducted in Michigan where agricultural educators were asked to rank the value or importance of these three philosophy classifications, competition and achievement were the highest-ranked by participants (Goodwin & McKim, 2020). By integrating elements of CDEs and LDEs within the classroom as appropriate, students are receiving additional time and practice preparing for these events. Additionally, advisors lead busy lives, and by doing this, they would have the potential to save practice time since students would have gained some initial exposure to the CDE or LDE and can either use the time saved by infusing elements of the competition into the classroom by going more in-depth with other content at practices or spend less time practicing with their teams outside of the school day; using the saved time for other personal or professional activities (Bowling & Ball, 2020). While the strategic use of instructional time and resources is seen as essential in developing a well-balanced and successful team, classes should not become "team training time" (Bowling & Ball, 2020).

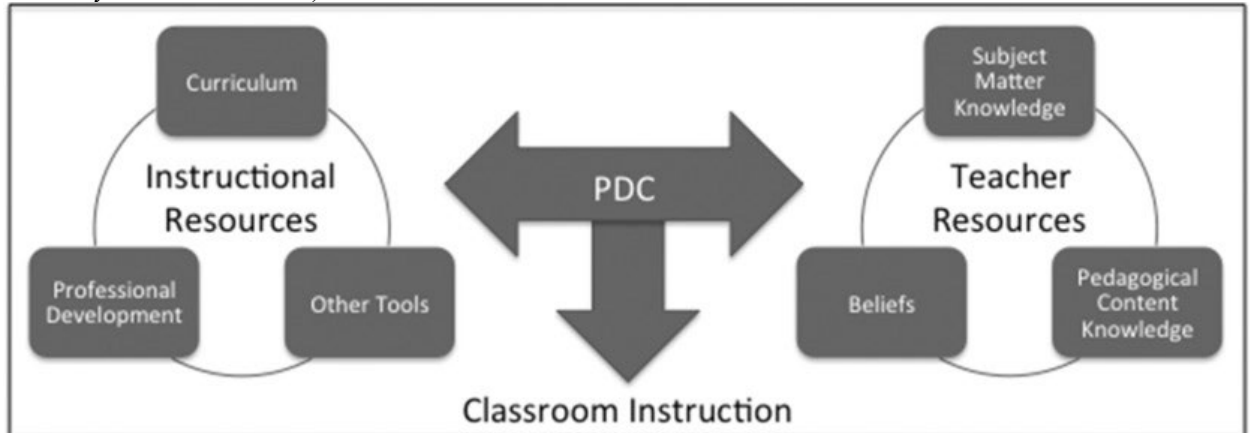
Conceptual Framework

The study has been conceptually grounded in the pedagogical design capacity and pedagogical content knowledge frameworks, and they have played an important role in the development of this research project. The concept of the pedagogical design capacity (PDC) was proposed by Brown (2002) through a study analyzing the different ways a group of educators introduced and executed a 10-week project. This theory served as a basis for this study. As indicated in Figure 1, to establish the PDC, instructional resources,

such as professional development and curriculum, combine with teacher resources, such as their beliefs, subject knowledge, and PCK to enable an environment for learning (Knight-Bardsley & McNeill, 2016).

Figure 1

The Interaction of Factors of Pedagogical Design Capacity and their Impact on Classroom Instruction (Knight-Bardsley & McNeill, 2016)



PDC is the interaction between instructional resources, including physical materials the teacher has, along with teacher resources, which consists of the teacher's values, knowledge, or beliefs—items which are not visible to us. PCK is a construct embedded within a teacher's PDC, but it is an important factor that was considered and investigated as part of the study. A teacher's PDC can vary depending on the subject matter being taught. Brown mentions that "The 'one size fits all' approach to curriculum design fails to appreciate the fact that teachers with different pedagogical design capacities might require different levels of articulation" (2002, p. 2).

While PDC and PCK are fluid depending on the content being taught, ultimately, the goal would be to strive to have a higher PDC and a higher PCK in as many content areas as possible through obtaining hands-on professional development experiences, becoming familiar with the context of each classroom or learner, and modifying their instructional methods to meet the needs of each context, but this likely will not be realistic for a teacher in every class they teach. Teachers who have a high PCK in a specific content area may have attained that knowledge due to their previous experiences within that content area, investment in professional development opportunities to build their working knowledge on the subject, or potentially their own interests (Brown & Edelson, 2003). These teachers might also believe the content area is important and strive to build their own knowledge of that particular subject area, leading to a higher PCK. Since agricultural education includes so many diverse pathways and opportunities, teachers likely will be asked to teach content outside of their specific interests and they will not have the same high PCK in each area; resilient teachers will capitalize on their strengths while not forgetting their deficits—seeking professional development in areas in which they can grow. The study seeks to understand the PDC and PCK of teachers within the population and examine the connection between their PDC or PCK and ability to implement competition in their instruction.

As part of this study's instrument, teachers are reporting their competence in the content they are facilitating content across the areas they are teaching. Teachers who have high perceived competence may choose to implement more competition within their classroom or program in general because they have the confidence to create and modify games, simulations, or exercises that are competitive in nature to supplement their other instructional methods. However, if a teacher's main purpose of implementing competition in the classroom is to recruit and train FFA teams, even if these competitive elements do not

even remotely relate to the content being taught within the class, this could lead to students and teachers perceiving everything as high stakes since they are primarily focused on extrinsic factors such as winning a trophy or recognition; this in turn could result in a more stressful learning environment for students and teachers alike.

The Factors of PDC and How SBAE Teachers Build PDC

A teacher's PDC does not have to be fixed—resilient and growth-minded teachers are likely to build their PDC through engaging in a variety of different opportunities. One of the most fundamental ways teachers can build their PDC at any stage in their career is through engaging in professional development opportunities (Easterly & Myers, 2019; Guskey, 2002; Thornton et. al, 2020). Guskey (2002) developed a model that connects closely with two of the items of PDC: professional development as an instructional resource and teacher beliefs as a teacher resource. Guskey's model operates on the idea that professional growth is an experiential learning process that involves trial and error. According to Guskey, the first component of teacher change is participating in professional development experiences. In agricultural education, professional development can take on a variety of different forms and it is available for individuals at any stage within their career, including agricultural education workshops, coaching and mentoring opportunities, classroom observations, participation in local, state, or national professional programming including the National Association of Agricultural Educators, and numerous others, and can lead to greater levels of overall career satisfaction (Easterly & Myers, 2019).

Building PDC takes time. However, professional development is a key way in which this can be achieved, as it shapes both areas of Brown's (2002) model: instructional resources along with teacher resources. When teachers initially access the professional development experiences they engage in, this increases their access to instructional resources. When teachers implement their learning, they elicit change within their classroom and hopefully see positive results, in turn, shaping their beliefs and their level of teacher resource. Therefore, effective implementation of professional development can shape both a teacher's knowledge along with their beliefs and attitudes relating to a concept or topic. The study examines resources, which are a significant portion of PDC, including professional development, to see the effectiveness of the resources teachers have used in their implementation of competition in their classrooms.

Purpose and Objectives

The purpose of this study was to examine how SBAE teachers implement competition within their classrooms. The goal of the study is to determine how SBAE teachers implement competition in their classroom, with considerations to their PCK and PDC. This study was guided by the following objectives:

1. To determine SBAE teachers' beliefs about competition as an instructional tool.
2. To determine SBAE teachers' pedagogical design capacity (resources and teacher skills) for their implementation of competition as an instructional tool.
3. To determine the types of competition being facilitated in SBAE programs.
4. To determine at what specific times or phases and frequencies within instructional sequencing competition is occurring in SBAE classrooms.

Methods

This study is a quantitative data collection study consisting of an instrument distributed to a non-probability convenience sample of secondary school-based agricultural education (SBAE) instructors attending Minnesota's agricultural educators' association summer conference.

Population and Sample

There are 312 SBAE teachers across Minnesota, and we had 72 participants within the study, yielding a response rate of 23.1%. Within the population, 45.8% ($n = 143$) identified as males and 54.2% ($n = 169$) identified as females (Sheehan, 2021; Sheehan & Rada, 2020; Sheehan & Rada, 2022). The majority of teachers were located in rural areas throughout Minnesota and are within their first 10 years of teaching. While not all SBAE teachers are members of the professional organization or attended the 2022 summer conference, over 90% of Minnesota's secondary teachers are members of the organization. Among the 72 participants within the study, the average years of agricultural education experience among participants was 7.9 years. Most study participants identified as female, with 53 identifying as female, 16 identifying as male, and three not reporting a gender. To control for nonresponse bias, a comparison was made for known parameters of the population using chi-square procedures as suggested by Johnson and Shoulders (2019). The comparison for the gender ($X^2(1, N = 69) = 11.92, p < .05$) and years of experience ($X^2(1, N = 72) = 3.97, p < .05$) were found to be significant indicating a difference between the sample and population. These results were not generalizable to the larger population. Caution should be made when interpreting these findings.

Data Collection and Instrument

The instrument consisted of several questions that highlighted teachers' implementation of competition within the agricultural education classroom across various content areas within agriculture, food, and natural resources. The questions that were designed were aligned with the objectives of the study. Questions were selected to develop items in an effort to understand the outcomes of the research objectives. Since there was not an already developed instrument for this research, questions were designed and a field test was conducted to assist in refining the items that were used and presented in the results section; a codebook was developed and utilized to track the data which contributed to each of the data analysis. A variety of items were developed, related to classroom competition, the three-component model, resources of PDC, skills of PDC, types of competition and the timing of competition. Prior to data collection, the research plan and questions were approved by the IRB.

The instrument was set out on the tables at the start of the secondary SBAE instructor meeting at the 2022 Minnesota Summer Conference. In an effort to share some context and describe the importance of this work, an overview of the instrument was provided to highlight the impact the findings could have on SBAE classrooms throughout the state and the nation. The goal of this was to build a relationship with the participants and increase participant interest and stake within the research (Lavrakas, 2008). While money is considered to be a replaceable and liquid form of economic exchange and incentive form in research, there is value in social exchange when administering research instruments (Lavrakas, 2008). The intangible value of making an impact on agricultural education classrooms and gaining insights on responses and data collected at a later date can serve as a motivational source for participants to truthfully partake in the instrument (Lavrakas, 2008). With that said, no incentive was provided for their voluntary participation in the research. In addition to reviewing the purpose of the study, an informed consent form was distributed so participants could acknowledge the risks and benefits of participation, and were reminded that participation is voluntary. At the conclusion of the overview, the survey was distributed, and all participants were thanked for their time and asked to turn in their responses.

In addition to capturing an adequate sample size that is representative of the true population of the state's SBAE teachers, conducting validity and reliability checks were important to ensure proper instrumentation. The instrument was created with the goal of measuring the content that it was intended to measure (content validity), correlate with other findings within the field (predictive or concurrent validity), and measure other concepts that may add value to the arsenal of existing knowledge within the research area (construct validity). Field-testing prior to data collection assisted in ensuring that these validity

measures were upheld to the fullest extent possible. The field test was administered online to SBAE teachers not from Minnesota to ensure content validity, predictive validity, and construct validity.

Data Analysis

To control for non-response bias, the proportion of respondents and non-respondents was determined to assist in confirming adequate participation in the study from the total statewide population of SBAE teachers. The data were computed in SPSS and presented as continuous or categorical scores.

Results

SBAE Teachers’ Beliefs About Competition as an Instructional Tool

The purpose of objective one was to determine SBAE teachers’ beliefs about competition as an instructional tool. Eight items on the instrument related to how teachers use competition in the classroom and seven items examined how teachers implement competition into the three-component model. The items within this area of the instrument allowed participants to report their opinions on a scale from one (strongly disagree) to five (strongly agree). These data points were treated as ordinal data and reported as frequencies.

For the items within this section of the survey that were related to competition in the classroom, the frequencies were calculated and those can be found in Table 1. When looking at the aggregate data for each of the statements combined, 67.4% of responses gathered across all items either indicated respondents’ agreement or strong agreement with all of the statements. The only exception to this trend was the responses gathered on the item “Competition hinders learning” and due to the wording of this statement, this outcome remains consistent with the other data collected within the study. A majority of teachers agreed or strongly agreed they enjoyed using competition (86.1%, *f* = 62), it is a useful teaching tool (88.9%, *f* = 64), and competition can motivate students to learn (93.0%, *f* = 67).

Table 1

Competition affinity among SBAE teachers

	n	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
I like using competition in my class	72	0	0.0%	2	2.8%	8	11.1%	49	68.1%	13	18.1%
Competition is a useful teaching tool	72	0	0.0%	0	0.0%	8	11.1%	54	75.0%	10	13.9%
Competition can motivate students to learn	72	0	0.0%	1	1.4%	4	5.6%	54	75.0%	13	18.1%
Competition hinders learning*	70	0	0.0%	9	12.9%	30	42.9%	28	40.0%	3	4.3%
Competition builds classroom community	70	0	0.0%	4	5.7%	19	27.1%	45	64.3%	2	2.9%
Competition can be an assessment tool	72	2	2.8%	13	18.1%	21	29.2%	30	41.2%	6	8.3%
Competition fits with what I teach in my classroom	72	1	1.4%	3	4.2%	18	25.0%	48	66.7%	2	2.8%
Competition is in line with my classroom goals	71	1	1.4%	11	15.5%	31	43.7%	24	33.8%	4	5.6%

* This item was reverse-coded

The purpose of the items related to competition in the total program was to evaluate teachers' use of competitive activities to carry out the elements of the SBAE model. Emphasis on these items were placed on the intersection of the classroom and laboratory instruction component and leadership development components; providing students with an opportunity to develop their skills in the classroom and prepare for FFA events such as CDEs and LDEs. For the three-component model items, the frequencies for each item are in Table 2. According to the results, 79.2% ($f = 57$) of respondents indicated they agreed or strongly agreed that FFA competitions motivate students, 75.0% ($f = 54$) indicated that they agreed or strongly agreed that FFA competitions can help them meet their SBAE program's goals, 88.7% ($f = 63$) of respondents indicated that they agreed or strongly agreed that FFA competitions related to their curriculum, 70.4% ($f = 50$) of respondents agreed or strongly agreed that FFA competitions should be incorporated in the classroom, and 55.6% ($f = 40$) of respondents indicated that they utilize FFA competition content to help them decide what to teach. Yet, many indicated disfavor toward utilizing class time to prepare their FFA competition teams. A total of 51.4% ($f = 37$) indicated that they disagreed or strongly disagreed with utilizing class time to prepare teams related to the course's content area, and 81.9% indicated disagreement or strong disagreement with the practice of utilizing class time to prepare teams not related to the content area ($f = 59$).

Table 2

Competition and three-component beliefs among SBAE teachers

	n	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
		f	%	f	%	f	%	f	%	f	%
FFA competition motivates students	72	0	0.0%	5	6.9%	10	13.9%	42	58.3%	15	20.8%
FFA competition helps me meet the agricultural education program's goals	72	0	0.0%	1	1.4%	18	25.0%	39	54.2%	15	20.8%
FFA competitions relate to my curriculum	71	0	0.0%	0	0.0%	8	11.1%	45	62.5%	18	25.0%
FFA competitions should be incorporated in the classroom	72	0	0.0%	6	8.3%	16	22.2%	35	48.6%	15	20.8%
I can use FFA competition content to help me decide what to teach	72	2	2.8%	11	15.2%	19	26.4%	31	43.1%	9	12.5%
I utilize class time to prepare teams related to the content area	72	11	15.2%	26	36.1%	14	19.4%	18	25.0%	3	4.2%
I utilize class time to prepare teams not related to the content area	72	28	38.9%	31	43.1%	5	6.9%	6	8.3%	2	2.8%

A semantic differential scale was used to evaluate attitudes about competition. For the purposes of data analysis, a rating of 1 indicated a negative perspective (left side), while a rating of 7 indicated a positive

perspective (right side). Most items had a negative term or term on the left side of the scale and a positive term on the right side, the only item that had a positive term on the left side was the second item.

Table 3

Semantic differential scale for teacher beliefs about competition SBAE teachers implement within their classrooms

	n	1	2	3	4	5	6	7
Detrimental vs. Beneficial	71	0 (0.0%)	0 (0.0%)	2 (2.8%)	6 (8.5%)	26 (36.7%)	28 (39.4%)	9 (12.7%)
Productive vs. Unproductive*	72	7 (9.7%)	9 (12.5%)	20 (27.8%)	25 (34.7%)	5 (6.9%)	5 (6.9%)	1 (1.4%)
Boring vs. Engaging	72	0 (0.0%)	1 (1.4%)	1 (1.4%)	4 (5.6%)	12 (16.7%)	36 (50.0%)	18 (25.0%)
Not rigor. vs. Rigorous	72	0 (0.0%)	0 (0.0%)	3 (4.2%)	14 (19.4%)	26 (36.1%)	20 (28.2%)	9 (12.5%)
Unhealthy vs. Healthy	72	0 (0.0%)	2 (2.8%)	1 (1.4%)	9 (12.5%)	36 (50.0%)	19 (26.4%)	5 (6.9%)

* This item was reverse-coded

Teachers' PDC for Implementation of Competition

The purpose of objective two was to determine teachers' PDC (resources and teacher skills) for their implementation of competition as an instructional tool. The first portion of PDC that was evaluated was teacher resources. According to Table 4, 70.4% ($f = 50$) of respondents agreed or strongly agreed the resources they use to teach can be used for competition, 22.5% ($f = 16$) disagreed or strongly disagreed that they had the physical items needed to implement competition the way they would like. Likewise, 46.5% ($f = 33$) did not indicate agreement with having the access to the materials they needed to implement competition, receiving the lowest level of agreement and the greatest variability. The data in Table 5 indicated the resources that were used most commonly, either on a weekly or daily basis, included 1:1 technology ($f = 45$), resources teachers created themselves ($f = 46$), and resources created by other teachers ($f = 43$).

Table 4

Beliefs about resources utilized by SBAE teachers in implementing competition within their classrooms

	n	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
		f	%	f	%	f	%	f	%	f	%
		I have access to the teaching materials I need to implement competition	71	1	1.4%	7	9.9%	25	35.2%	34	47.9%
The resources I use to teach can be used for competition	71	0	0.0%	6	8.5%	15	21.1%	46	64.8%	4	5.6%
I have the physical items I need to implement competition in the classroom	71	1	1.4%	15	21.1%	21	29.6%	32	45.1%	2	2.8%
The curricular materials I use lend themselves to using competition as a teaching strategy	71	2	2.8%	7	9.9%	28	39.4%	31	43.7%	3	4.2%

Table 5

Frequency of resources utilized by SBAE teachers in implementing competition

	n	Never		1-2 Times per Course		Monthly		Every Week		Daily	
		f	%	f	%	f	%	f	%	f	%
		1:1 Technology	71	3	4.2%	8	11.3%	15	21.1%	21	29.6%
Agriculture in the Classroom	71	22	31.0%	25	35.2%	18	25.4%	6	8.5%	0	0.0%
CASE	71	49	69.0%	7	9.9%	6	8.5%	4	5.6%	5	7.0%
iCEV	70	48	68.6%	12	17.1%	7	10.0%	3	4.3%	0	0.0%
State Association of Agricultural Educators	71	7	9.9%	21	29.6%	36	50.7%	7	9.9%	0	0.0%
FFA	71	3	4.2%	20	28.2%	36	50.7%	10	14.1%	1	1.4%
Pinterest	70	32	45.7%	21	30.0%	11	15.7%	6	8.6%	0	0.0%
Teachers Pay Teachers	71	44	62.0%	15	21.1%	9	12.7%	3	4.2%	0	0.0%
TikTok	71	49	69.0%	13	18.3%	4	5.6%	4	5.6%	1	1.4%
Resources Created Myself	71	0	0.0%	13	18.3%	12	16.9%	24	33.8%	22	31.0%
Resources Created by Other Teachers	70	0	0.0%	11	15.7%	16	22.9%	26	37.1%	17	24.3%

In addition to teacher resources, PDC also consists of teacher skillset (Brown, 2002). Another question on the instrument evaluated respondents' self-reported skill level for implementing competition within their classrooms, as illustrated in Table 6. Overall, teachers believed they have the skills to implement

competition; 77.4% ($f = 55$) of respondents agreed or strongly agreed they have these skills and 78.9% ($f = 56$) indicated they agreed or strongly agreed they can guide student learning using competition. Additionally, Table 7 provides a summary of the data captured in Table 6 but based on years of experience. In Table 7, beginning SBAE teachers (B) reported having less than three years of teaching experience; experienced SBAE teachers (E) reported having more than three years of experience. Based on the findings presented in Table 7, overall, it was determined that experienced teachers reported having more confidence in their skills to implement competition across all five statements on the instrument.

Table 6

Skill levels of SBAE teachers in implementing competition

	n	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
		f	%	f	%	f	%	f	%	f	%
I have the skills to implement competition	71	0	0.0%	1	1.4%	15	21.1%	48	67.6%	7	9.9%
My professional experiences prepared me to implement competition	71	0	0.0%	9	12.7%	13	18.3%	40	56.3%	9	12.7%
I feel competent in implementing competition	71	0	0.0%	7	9.9%	11	15.5%	46	64.8%	7	9.9%
I am able to guide student learning by using competition	71	1	1.4%	6	8.5%	9	12.7%	51	71.8%	5	7.0%
I am comfortable enough with the content I teach to implement competition	71	1	1.4%	2	2.8%	17	23.9%	46	64.8%	5	7.0%

Table 7

Skill levels of SBAE teachers in implementing competition based on years of teaching

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	B	E	B	E	B	E	B	E	B	E
	I have the skills to implement competition	0	0	1	0	6	7	23	25	2
My professional experiences have prepared me to implement competition	0	0	5	4	7	5	18	21	2	7
I feel competent in implementing competition	0	0	2	5	6	4	23	22	1	6
I am able to guide student learning by using competition	0	0	1	5	6	2	25	25	0	5
I am comfortable enough with the content I teach to implement competition	1	0	0	2	8	7	23	23	0	5

Note: "B" columns refer to beginning teacher (less than 3 years teaching); "E" columns refer to experienced teacher (more than 3 years teaching)

Types of Competition in SBAE Programs

The purpose of objective three was to determine the types of competition being facilitated in Minnesota’s SBAE programs. A question on the instrument listed up to six options for types of competition facilitated in the classroom. For this question, respondents were asked to read each of the provided options and indicate their frequency of implementation using the provided scale. Respondents were asked to report the frequency in which they utilize these different options on a scale from “never” to “daily.”

Table 8 presents an overview of the frequency of the different competitive elements or strategies SBAE teachers may choose to implement within their classroom settings. As shown in this table, digital games were cited as the most commonly utilized competition method, with 30.0% (*f* = 21) reporting using them at least weekly and 75.7% (*f* = 53) using them at least monthly.

Table 8

Frequency of different competitions SBAE teachers implement within their classrooms

	n	Never		1-2 Times per Year		Monthly		Every Week		Daily	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Individual assessment tracking	69	18	26.1%	12	17.4%	22	31.9%	13	18.8%	3	4.3%
Online games	70	2	2.9%	15	21.4%	32	45.7%	19	27.1%	2	2.9%
Team competitions	70	7	2.9%	29	41.4%	27	38.6%	7	10.0%	0	0.0%
Non-digital games	71	16	22.5%	29	40.8%	23	32.4%	3	4.2%	0	0.0%
Mock FFA CDEs	71	12	16.9%	38	53.5%	19	26.8%	2	2.8%	0	0.0%

Additionally, data were collected to measure SBAE teachers’ participation in coaching CDEs and LDEs. Table 9 provides an overview of how many teachers reported coaching any event within the last five years. For example, a teacher coaching a national-level Livestock Evaluation CDE team would not be included in the state- or regional-level data reported in the table. Table 10 presents an overview of the different events along with teachers’ highest level of participation in coaching teams within each area over the last five years. Again, this table compares the highest level of participation overall.

Table 9

School-based agricultural education teachers’ participation in coaching FFA career and leadership development events at the highest level over the last five years

	n	Frequency	Percentage
Regional-level	69	3	4.3%
State-level	69	38	55.1%
National-level	69	28	40.6%

Table 10

School-based agricultural education teachers' participation in coaching FFA career and leadership development event teams over the last five years

	n	Region	State	National	Cumulative Frequency	
Livestock Evaluation	69	19	33	2	54	78.3%
Fish and Wildlife Management (ENR)	69	22	27	2	51	73.9%
Horse Evaluation	69	25	23	2	50	72.5%
Small Animals and Veterinary Science	69	21	23	1	45	65.2%
Creed Speaking	69	23	16	3	42	60.9%
Floriculture	69	21	20	1	42	60.9%
Dairy Cattle Evaluation	69	14	24	0	38	55.1%
Poultry	69	13	19	3	35	50.7%
Agricultural Mechanics	69	16	17	1	34	49.3%
Crops	69	13	17	2	32	46.4%
Employment Skills	69	16	14	2	32	46.4%
Meats Evaluation	69	12	19	1	32	46.4%
Milk Quality and Products	69	12	17	2	31	44.9%
Best Informed Greenhand	69	11	18	1	30	43.5%
Forestry	69	11	18	1	30	43.5%
Nursery and Landscape Technology	69	9	18	1	28	40.6%
Farm Business Management	69	6	16	3	25	36.2%
Extemporaneous Speaking	69	13	8	2	23	33.3%
Farm Bureau Discussion Meet	69	8	14	—	22	31.2%
Prepared Public Speaking	69	9	11	2	22	31.2%
Soils Evaluation	69	8	13	—	21	30.4%
Agricultural Sales	69	7	11	1	19	27.5%
Food Science	69	5	10	4	19	27.5%
Conduct of Chapter Meetings	69	5	7	1	13	18.9%
Parliamentary Procedure	69	6	6	1	13	18.9%
Dairy Cattle Handler	69	4	6	0	10	14.5%
Marketing Plan	69	2	6	2	10	14.5%
Agricultural Issues	69	1	3	3	7	10.1%
Agricultural Communications	69	0	2	3	5	7.2%

Times, Phases and Frequencies of Competition in SBAE

The purpose of objective four was to determine at what specific times or phases and frequencies within instructional sequencing is competition occurring in SBAE. On the instrument, respondents indicated the frequency of their use of competition to facilitate learning at different points of the educational process within a typical course using a continuous scale. Table 11 presents an overall summary of when teachers tend to use competition as a teaching method within their classroom. While 86.1% ($f = 62$) of respondents indicated they like utilizing competition within their classes, the times in which they preferred to implement it within their classroom varied. Formative assessment generally occurs in the middle of a unit, and this was the favored time among participants, as 63.4% ($f = 45$) indicated this was an opportune time to implement competition, as they utilize this practice at least 5-6 times per course.

Table 11

Timing of different competitive elements school-based agricultural education teachers implement within their classrooms

	n	Never		1-2 Times per Course		3-4 Times per Course		5-6 Times per Course		>6 Times per Course	
		f	%	f	%	f	%	f	%	f	%
Pre-assessment start of a unit	71	12	16.9%	45	63.4%	10	14.1%	2	2.8%	2	2.8%
Formative assessment	71	1	1.4%	8	11.3%	17	23.9%	14	19.7%	31	43.7%
Summative assessment	70	2	2.9%	19	27.1%	22	31.4%	17	24.3%	10	14.3%
Identification skills	70	3	4.3%	17	24.3%	18	25.7%	23	32.9%	9	12.9%
Using competition to add variety to lessons	70	4	5.7%	24	34.2%	22	31.4%	8	11.4%	12	17.1%

Conclusions and Recommendations

Conclusions

The conclusions provide a starting point for integrating the background in the literature review, paired with the findings of this study. It should be noted that there are limitations to this study, including that it only captured the opinions of 72 SBAE teachers and that the analysis was conducted utilizing an instrument that asked all of the respondents to provide the researchers with self-reported values. The items on the instrument were developed by the researchers due to a lack of previous research surrounding the topic of implementing competition within the classroom setting.

Conclusions: SBAE Teachers’ Beliefs About Competition as an Instructional Tool

Most teachers agreed they enjoyed using competition and found it to be a useful teaching tool and a source of student motivation. This is consistent with the findings of the literature; competition can be a way to motivate students (Shindler, 2009). While competition generally results in a form of motivation referred to as extrinsic motivation and that this motivation may diminish in the long-term settings or if overused, if balanced correctly, competition can be a motivational tool to encourage students to do their best, especially if connected to some type of incentive (Ryan & Deci, 2000; Shindler, 2009). However, some teachers believe that competition may not be in line with their classroom goals. While teachers may enjoy implementing competition in their classroom, perhaps some may not think competition is an effective engagement tool.

Items related to competition in the total program evaluated teachers’ beliefs in competition integration as a way to connect the elements of a balanced SBAE program; this study looked at the intersection of classroom instruction and leadership development through examining the patterns of teachers implementing FFA competition opportunities within their classrooms. While most teachers believe competition can help motivate students, and that many use FFA competitive events to guide what they teach in their classroom, a majority of teachers expressed disfavor toward utilizing class time to prepare students for FFA competitions, even those that may be related to the content area.

Teachers indicated positive perceptions overall, indicating competition was more beneficial than detrimental, more productive than unproductive, more engaging than boring, more rigorous than not rigorous, and healthier as opposed to unhealthy; revealing teachers' positive perception toward competition.

Conclusions: Teachers' PDC for Implementation of Competition

Objective two aimed to determine SBAE teachers' PDC, specifically their resources and skills, for their implementation of competition as an instructional tool. Brown (2002) identified PDC as a model that considers a teacher's ability to modify content to meet the needs of their students or their goals through instructional resources, such as curriculum and professional development, along with teacher resources, including their beliefs and knowledge.

When examining the resources teachers utilize to implement competition in their classrooms, most teachers generally believed the resources they use to teach can be used in the competition, but are limited in that they wanted more physical items; these items could include anything ranging from kits or games used to implement competition, or potentially even realia to engage students in competition such as animals for livestock judging or access to soil samples to help teach land judging. Likewise, resources that were used most commonly by teachers included 1:1 technology or teacher-created resources.

Teachers believe they have the skills to implement competition. However, experience level could be an underlying variable to consider. More experienced teachers maintained greater belief in their ability to implement competition, which may be attributed to having access to additional resources, or more teaching experiences.

Conclusions: Types of Competition in SBAE Programs

The goal of objective three was to determine the types of competition being facilitated in SBAE programs. While many teachers generally did not report utilizing any one method of competition on a daily basis, many reported using a competitive element in their classroom at least on a weekly or monthly basis. Some online tools such as Gimkit, Quizlet Live, Quizizz, and Kahoot! have become tools that teachers utilize to engage students in digital-based competitions to advance or assess learning (Aldana, 2020; Çulha, 2021). Despite each respondents' indicated participation in coaching at least one regional FFA CDE or LDE competition within the last 5 years, with nearly all participants reporting coaching at least one state CDE team, mock FFA CDEs was the least frequented form of competition, despite FFA opportunities being an integral component of the agricultural education model (Bolton, et al., 2018; Croom, 2010; Jones & Edwards, 2019). Based on the PDC model, teachers may need access to additional resources or professional development so they can identify ways to integrate FFA opportunities into their classes, or some may avoid doing so due to fear of overdoing FFA (Bowling & Ball, 2020). Alternatively, some may not see connections between CDEs or LDEs and their courses.

Conclusions: Times, Phases and Frequencies of Competition in SBAE

The fourth objective aimed to determine at what specific times within instructional sequencing is competition occurring in SBAE classrooms. Respondents have preference toward utilizing competition at various stages throughout their instructional sequencing, however, most showed preference for using competition formatively, either to add value to the existing content, or potentially to teach or reinforce identification skills. Teachers could import formative assessments into digital platforms such as Quizizz as a way to engage learners in competition (Aldana, 2020; Çulha, 2021).

Recommendations

Based on the conclusions, a series of recommendations for further research and professional practice has been developed. These recommendations provide SBAE stakeholders with opportunities to advance the knowledge we have about the implementation of competition.

Recommendations: SBAE Teachers' Beliefs About Competition as an Instructional Tool

In order to learn more about the various patterns discovered from the findings in this study, it is recommended that further research is designed to address the wide range of responses within the data presented throughout Tables 1 and 2. It would be beneficial for researchers to understand why competition is not in line with as many teachers' curriculum goals as some of the other items that were measured on the research instrument, especially if SBAE teachers view embedding competition-related activities as an engaging classroom practice. When looking at the integration of FFA activities within the classroom setting and the three-component model of SBAE, it would also be beneficial for researchers to understand why SBAE teachers indicated that FFA competitions should be incorporated within their classroom, and they also indicated that they use CDE content to help them decide what course concepts to teach. Despite these findings, the respondents still indicated a general lack of interest in utilizing class time to prepare their teams, even those that connect directly to the content area being taught. What does team preparation look like in the classroom setting, and where is the line drawn between FFA practice for a group of three to five students, and classroom learning experiences provided for all students? Is there a line that needs to be drawn as long as all students are learning content within the realm of the course goals? Further qualitative research in the form of interviews or classroom observations could help researchers understand where this line is drawn by SBAE teachers.

The findings from objective one also uncovered a professional practice for consideration by stakeholders including post-secondary institutions, curriculum designers and the National FFA Organization. A majority of respondents at least agreed that FFA competitions, including CDEs and LDEs, should be incorporated in the classroom, and the majority of respondents indicated that they utilize FFA competitions to help them decide what to teach. These data points pose new areas of research and should be posed to a larger audience. If responses are similar, stakeholders should create resources that connect SBAE content areas to FFA CDEs or LDEs, for example, quiz question banks in the form of competitions such as Kahoot! games that are crosswalked to the AFNR frameworks for teachers to use as a starting point in developing classroom resources, just as CDE and LDE committees use AFNR frameworks to develop and review events. In doing this, teachers might be more willing to discover how they can use class time to teach content while integrating two of the components of the three-component model. If SBAE teachers choose to implement these types of competitions in the creation or modification of content, attention should be made to ensure learning experiences meet the content needs for the subject through continual review, involving relevant stakeholders in this process.

Recommendations: Teachers' PDC for Implementation of Competition

To build upon the findings of objective two, additional research should be conducted around some of the following topics. Learning about the physical items SBAE teachers want in order to implement competition might be a helpful question to pose. Only 2.8% ($f = 2$) of respondents strongly agreed they had access to the broad physical items, such as student technology devices, game boards or even content-specific items such as livestock, that they needed to implement competition in their classroom. Perhaps a lack of resources may lead to teacher's lack of ability to implement competition effectively, or at all, within their programs. Researchers could pose questions to uncover how teachers adapt resources to utilize for competition, and what physical resources they truly need. Teachers generally felt comfortable with their abilities to implement competition within their classrooms. Furthermore, researchers could ask questions

centering around the idea of professional development and resource acquisition that assist teachers in implementing competition within their programs through determining what experiences or resources have helped prepare SBAE teachers to implement competition in their classrooms. While experienced teachers indicated more agreement with professional experiences preparing them to presently implement competition in the classroom, both experience ranges had below one-fifth of respondents strongly agreeing their professional experiences prepared them to implement competition in their classrooms. Research should be conducted to determine what needs exist for implementing competition within the classroom to better prepare SBAE teachers to feel more comfortable implementing competition.

PDC consists of many elements, notably teacher resources and skills (Brown, 2002). The research indicates teachers' willingness to implement competition, but a lack of resources, and in some cases, skills, is a barrier to effective implementation. Upon further investigation centered around the recommended questions, professional development opportunities can be designed to increase teachers' knowledge of and ability to implement competition as a teaching strategy, namely in modifying existing resources. Alternatively, if it is determined that lack of resources or physical items needed to implement competition is the main barrier, kits that include items such as breakout room locks or modifiable game boards could be distributed to teachers either through a grant program or through checking them out similar to a library or rental program.

Recommendations: Types of Competition in SBAE Programs

To explore the findings from objective three more fully, researchers should consider investigating questions surrounding two key areas. Researchers can investigate how teachers go about selecting one form of competition over another. Perhaps there is a stigma with certain types of competition within their classroom, or potential barriers such as limited physical resources for non-digital games, or even financial barriers some SBAE teachers must overcome in order to access some platforms, such as the subscription costs for versions of Quizizz or other digital game platforms. Alternatively, perhaps there are concerns about competition being overwhelming to students or teachers at certain stages of the instructional unit, especially since some previous research has indicated competition can diminish peer-to-peer relationships or cause students to become more reserved, lose interest in the content being taught, or a diminishment in intrinsic motivation for students (Kohn, 1992; Shindler, 2009).

Recommendations: Times, Phases and Frequencies of Competition in SBAE

To further the current knowledge regarding teachers' choices for sequencing and embedding competition within their courses, it is recommended to uncover the reasoning why so many are reporting not utilizing competition as a summative assessment. There could be concerns of traditional competition being intertwined with grades, or underlying concerns with teachers' own skills and comfort level using competition as something that is traditionally viewed as high-stakes (Kowalski & Christensen, 2019). The idea of having competition count as a high-stakes assessment may deem it as unhealthy competition and deter teachers and students from engaging in competition as a summative tool. Designing research to explore these insights could help curriculum developers create resources, perhaps designed as review or formative assessment, to facilitate competition within courses, or help post-secondary institutions gain insights into ways they could model competition as a teaching tool with pre-service teachers.

This study indicates teachers choose to implement competition less as an introductory activity at the start of a unit or as a summative activity. We know competition can be an effective tool for boosting engagement within a lesson (Çulha, 2021). However, by using competition at the start and the end of a unit as a recommended best practice, this may strengthen student motivation and performance during the unit. Additional resources can be developed to help teachers implement competition in both of these areas in any course. Furthermore, the National FFA Organization can develop additional game-based items to help

students learn identification skills for CDEs. This way, teachers beginning to implement competition could have a starting point and could modify it to meet their needs, while also encouraging CDE or LDE participation.

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