Journal of Agricultural Education, 66(1), Article 48
https://doi.org/10.5032/jae.v66i1.3018

Examining Trends in Iowa Career Development Event Participation

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Abstract

The purpose of this study was to assess trends and potential barriers to participation within career development event (CDE) competitions hosted throughout Iowa over the course of eight years. Target data was collected following the Knowledge Discovery in Databases (KDD) procedure outlined by Fayyad, et al. (1996). The population included data representing 241 Iowa FFA chapters and examined factors such as mileage to competition sites, each school district's free and reduced lunch rates, the number of teachers within the program, years of teaching experience, and much more. FFA chapters were then ranked based on participation levels based on the eight years of participation data collected. Among the top 15 most engaged chapters within various CDE competitions, they tended to have lower mileage needed to travel to events throughout the year, more teachers serving within their agricultural education programs, larger school sizes, and lower free and reduced lunch rates than the 15 least engaged chapters, revealing the potential for barriers to participating in CDE and LDE events within Iowa. Future professional practice needs might include providing resources for teachers, specifically those in single-teacher programs, with assistance in finding or leveraging potential community partners or funding resources. The research also revealed the need for additional areas of inquiry for future research, including the examination of student motivational factors, participation levels based on hosting events from school as opposed to non-school days, and examining if there are differences in the management modalities or coaching practices between top and bottom engaged chapters.

Introduction

School-based agricultural education (SBAE) teachers play an integral part when engaging students in the 3-component model of a complete SBAE program (Croom, 2008). Within this model, student engagement in over 20 career development events (CDEs) and leadership development events (LDEs) play a critical role within SBAE programs, allowing students to apply knowledge which has been gained through SBAE classes (Bowling et al., 2020; Goodwin & McKim, 2021; National FFA Organization, 2023). Students' growth and skill development can occur at various times throughout the process of preparation, during, and following the event through reflective conversations surrounding the CDE or LDE competition (Goodwin & McKim, 2020).

Research suggests the facilitation and preparation of CDE teams is a trademark of effective SBAE teachers (Roberts & Dyer, 2004), and the preparation of CDE teams has been identified by Terry and Briers (2010) as one of the top ten responsibilities of SBAE teachers. Sapp and Thoron (2014) indicate teachers can expect to spend approximately six weeks, or upwards of 20 hours, preparing a single CDE team,

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Author note. This paper is a product of the Iowa Agricultural and Home Economics Experiment Station, Ames, Iowa. Project No. IOWO3913 and sponsored by Hatch Act and State of Iowa funds.

depending on the students' goals. As a result of this time investment, on top of teaching and managing supervised agricultural experience programming for their agricultural education students, many SBAE teachers view CDE and LDE coaching as a potential physiological and psychological stressor; research has reported teachers spending upwards of greater than 10 percent of their professional time to preparing CDE or LDE teams for their respective competitions (Bowling & Thieman, 2010). These figures can be much greater as well, especially in programs where there is history or tradition of success regarding CDE or LDE engagement on a local, state, or national level (Bowling & Ball, 2020). Additional research has examined the following factors of CDEs: (a) perceived value (Blakely, et al., 1993), (b) SBAE teachers' support for CDEs (Lundry, et al., 2015), (c) level of preparation for CDE events perceived by students (Deeds & Thomas, 1999), and (d) student motivations with participating in CDEs (Russell, et al., 2009; Ball et al., 2016).

With the increasing number of students enrolled in SBAE and the expansion of programs nationwide (Wright et al., 2021), there is a need to assess not only the relevance and effectiveness of CDEs and LDEs, but also trends in student and teacher engagement within these events. In doing so, barriers to CDE and LDE participation can be identified and addressed, especially since Iowa's state-level FFA CDEs and LDEs are hosted at six different locations around the state intermittently throughout the year. The purpose of this study is to examine factors that influence FFA chapters' participation in state CDEs, including demographic factors such as socioeconomic status indicators, and distance to the six state CDE host sites.

Literature Review

Historical Participation & Role of Career Development Events in the 3-Component Model

SBAE teachers have a responsibility of facilitating quality programming across the 3-component model of agricultural education, consisting of classroom and laboratory instruction, experiential or work-based learning through supervised agricultural experiences, and leadership development through FFA (Croom, 2008). Agricultural competitions began as early as 1925, just three years prior to the conception of the National FFA Organization, with the first dairy cattle judging competition (Jones & Edwards, 2019). Since then, these contests have evolved into industry-driven career and leadership development events and have been gaining popularity nationwide. A study conducted by Talbert and Balschweid (2006) discovered that throughout FFA members' careers, approximately 70 percent of members report engaging in at least one CDE or LDE competition at some point. Now supported by national agriculture, food, and natural resources (AFNR) standards along with connection to common core areas such as math, science, and language arts, CDEs and LDEs have provided students with an opportunity to gain career development experiences in a competitive environment.

The crosswalk of AFNR standards with specific state and national CDE and LDE competitions provides enough rationale and convenience for some teachers to justify implementing elements of the competition areas within the classroom. A study conducted by Goodwin and McKim (2020) emphasizes the role of CDE and LDE competitions in providing an opportunity to further expand classroom learning to a real-world context. A ranking question utilized in an instrument attempted to measure 92 Michigan SBAE teachers' beliefs on the philosophy and purpose of CDE and LDE competitions within the total SBAE experience. The instrument was designed so lower numbers indicated the most important outcomes and the higher numbers indicated the least important outcomes. Since there were a total of nine options, average rankings could range anywhere from one to nine. According to the results, the highest-ranking items for CDE outcomes included: 1) application of classroom learning ($\mu = 3.14$; $\sigma = 1.90$), 2) development of leadership and life skills ($\mu = 3.21$; $\sigma = 2.15$), and 3) development of career-specific skills ($\mu = 3.47$; $\sigma = 1.69$) (Goodwin & McKim, 2020). On the other hand, providing opportunities for programs to maintain a reputation of success ($\mu = 7.18$; $\sigma = 1.87$) or to compete or win ($\mu = 7.66$; $\sigma = 1.87$) were ranked as the lowest-ranking factors. The instrument also included an opportunity for participating teachers to indicate

alignment between CDEs and their curriculum; they found that 100% of teachers indicated their use of at least some of the problem-solving components of CDEs in order to teach content and help students develop skills (Goodwin & McKim, 2020). This practice utilizes CDEs as an industry-validated instructional tool (Lundry et al., 2015) and as an opportunity to bridge classroom instruction and FFA in the 3-component model (Croom, 2008; Ramstad, 2023; Ramstad et al., 2024).

Despite the connections and existing overlap between CDE and LDE areas with their respective classroom content areas (Goodwin & McKim, 2021), a major point of contention lies in how much class time should be devoted toward preparing teams during the school day as opposed to out of the school day (Ewing et al., 2014; Ramstad, 2023). While overlap does exist among the curriculum and the various CDE and LDE areas, some question the amount of time a teacher should be spending in their classroom preparing teams. For example, using curricular resources such as identification quiz games based on the respective content-related CDE identification lists using Quizizz or Kahoot! can be considered a practice for recruiting students for potential CDE teams, while also teaching the whole class about industry-relevant species or equipment, some teachers even have hesitation in doing this (Ramstad, 2023; Ramstad et al., 2024). Some SBAE teachers believe this practice alone may cross a line, while others view it as acceptable and as a way to save time in coaching or preparing their teams (Ramstad, 2023; Ramstad et al., 2024).

Motivating Factors of Participation for Students and Programs

Several studies have been conducted in an effort to understand the motivating factors of participation in CDE and LDE events for students (Ball et al., 2016; Goodwin & McKim, 2020; Knobloch et al., 2016; Russell et al., 2009). Knobloch et al. (2016) conducted a quantitative study which evaluated 419 students' factor loadings using a conformity factor analysis in the areas of attainment, cost and utility value, intrinsic value, and self-efficacy. The results indicated the ability to learn something new, enjoyment of competition, and the personal enjoyment of the specific content area were among the top motivating factors for a student's choice to engage in a particular event (Knobloch et al., 2016). Additional research after the study conducted by Knobloch and colleagues also reaffirms students' enjoyment of competition (Goodwin & McKim, 2020; Russell et al., 2009), and teachers' ability to facilitate competition-based instruction pertaining to both curriculum and FFA engagement opportunities (Ramstad, 2023). Additionally, student participants indicated they were willing to take time to study with their team, with 65% indicating they were even willing to come in to study with their teammates on a Saturday. Not only does this support the notion of students being highly competitive (Goodwin & McKim, 2020; Knobloch et al., 2016; Russell et al., 2009), this characteristic also aligns well with students' perception of their success within an event, which is reflected in 73% of participants recognizing their engagement in a CDE assists with the acquisition or refinement of career skills and 70% of participants believing engagement in a CDE can make them more competitive for scholarships and awards (Knobloch et al., 2016).

Further research has found external motivators such as awards, recognition, and scholarships are important throughout the CDE preparation process. However, successful coaches are able to help students channel their intrinsic motivation as the day of the competition approaches. Some of these included developing an appreciation for developing content knowledge, developing practical skills they can use in their daily lives, leveraging job marketability, and developing career-related skills (Ball et al., 2016; Lundry et al., 2015).

When looking at motivating factors for participation in CDE and LDE competitions for the chapter as a whole, winning and meeting existing or self-imposed pressures or expectations from the administration or community can be a potential source (Bowling & Ball, 2020; Goodwin & McKim, 2020). However, the existing research indicates that the most effective CDE coaches will not be motivated by winning (Bowling et al., 2020; Bowling & Ball, 2020), but rather, in developing student skills, including non-cognitive skills such as grit and optimism (Smith & Thapa, 2022) or skills that will assist them in building upon their own leadership abilities or working toward career-specific skills (Lundry et al., 2015).

Benefits of Participation

Many studies have evaluated the benefits of participation within CDE and LDE competitions (Goodwin & McKim, 2020; Lundry et al., 2015; Marx et al., 2014). Lundry et al. (2015) conducted a Delphi study to evaluate Oklahoma SBAE teachers' perceived skill acquisition for their students. Jurors within the study indicated the top skills students gain include teamwork, competition, goal achievement, time management, work ethic, leadership, reasoning, and problem-solving to name a few of the 25 skills that achieved consensus by round two or three of the study. These skills assist students in developing skills to not only achieve their career goals, but also to assist them in exploring opportunities they may potentially desire to pursue, or on the other hand, explore careers they may not want to pursue.

To expand on the idea of skill acquisition as a benefit to engagement within CDE and LDE opportunities, we recognize there is an increased demand for agricultural careers in today's labor market (Hill et al., 2021). The National FFA Organization has developed a variety of CDE opportunities which correspond with each of the nine nationally-recognized AFNR pathways, ranging from agricultural mechanics through veterinary science (National FFA Organization, 2023; Ortiz, 2023). CDEs are reviewed regularly by industry professionals in an effort to provide experiences which model real-world expectations of careers within each of the different CDE and LDE areas (National FFA Organization, 2023). As a result of these efforts, Lundry et al.'s (2015) study revealed that 93% of teachers agreed that CDEs expose students to specific career opportunities within the agricultural industry, and that students engaging in CDEs have a greater potential of pursuing an agricultural career. When using effective coaching skills and when experiences are facilitated effectively, student learning can occur prior to, during, and following the CDEs or LDEs a student chooses to engage in, and as a result, these experiences can open students' eyes to potential opportunities they can pursue within their future and in turn, increase their career decision self-efficacy (Goodwin & McKim, 2020; Marx et al., 2014) and the unique skills they can offer a prospective employer to set them apart from other competitors in the job market (Goodwin & McKim, 2020). Students getting an early start at developing agricultural skills serves as a significant benefit for both students and the agricultural industry as a whole, but also it can serve as a positive reflection of the SBAE program in its ability to prepare students for careers within the industry (Marx et al., 2014), along with potentially assisting in reducing labor shortages within their local communities.

Another significant benefit to engagement within CDEs and LDEs is the ability for students to engage in interdisciplinary learning; applying learning they have gained in core classes such as math, science, social studies, and language arts to the content they are learning in agricultural education. A study conducted by Mouser et al. (2019) revealed FFA members who took a standardized math assessment outperformed those who were not FFA members, and both populations performed similarly on a reading standardized assessment. The ability for SBAE students to apply learning from core classes in their various FFA competitions, including CDEs, LDEs, and even SAE programming, enables students to reap the benefit of core academic skill reinforcement.

Barriers of Participation

While there are many perceived benefits to engagement within CDE and LDE competitions, the literature also reveals some significant barriers that must be taken into account. Research conducted by Bowling and Thieman (2020) revealed the physiological stress caused by engagement within state-level CDE competitions for both teachers and students. In their study, they measured stress reactions in the form of heart rate throughout engagement before, during, and after their engagement in the competition, using their resting heart rate as a basis for comparison. Factors such as the need to wake up early to drive a school bus to the competition, along with other personal-related experiences unrelated to the competition, such as depression or a recent death within the family, also contributed to elevated heart rates in the participating teachers and/or students; these are potential variables that could realistically influence a teacher's experience at a typical CDE competition day. As a result of the study, nine out of 10 participating students showed inadequate cognitive and physical recovery times due to stress placed to perform well in their events

for time periods of up to four hours, and could lead to negative long-term impacts on students or potentially harm relationships between students and their teachers (Bowling & Thieman, 2020), thereby potentially diminishing the quality of a student's experience competing in a CDE or LDE.

Another barrier that has been discussed in the literature is lack of teacher training regarding CDE and LDE coaching. In a study conducted by Harris (2008), there were several CDE areas in which teachers did not report having participation at the district or state level, including agricultural sales, agricultural communications, and food science to name a few. A high amount of interest in professional development related to these specific CDEs was found in a follow-up question, indicating that perhaps a lack of teacher knowledge on the CDE may limit their interest in promoting or coaching a particular CDE or LDE area (Bowling & Ball, 2020; Harris, 2008).

Lastly, another key factor this study attempts to uncover is the socioeconomic barriers associated with CDE and LDE engagement for some students or school districts across Iowa. In Iowa, CDE and LDE competitions are hosted at a variety of locations, and depending on a chapter's proximity to the competition or host site for a particular event, it will cause increased expenses for a school district to send a team to compete. While there has not been a great deal of research that has been conducted in these areas, increased travel demands result in increased mileage and depreciation of buses or other transportation sources, along with substitute costs. As a result of these expenses, some districts lack the finances to make it possible for teachers to bring students to all of the competitions they may desire to participate in throughout the year.

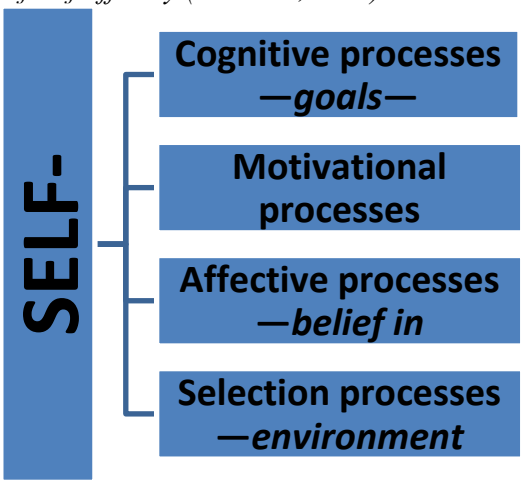
Conceptual Framework

FFA is considered a key component in providing positive youth development opportunities for students who are in SBAE programs (National FFA Organization, 2023). The year-round structure of FFA, along with opportunities on a local, regional, state, and national level allows students the opportunity to achieve personal goals and engage in a wide variety of career- and leadership-centered activities inside and outside of the organization (Croom & Flowers, 2001). Spady (1970) indicated students who are participating in more activities report the highest aspirations. The preparation for a CDE or LDE competition is a continuous process, and throughout this process, a teacher needs to motivate their students and the students also need to find ways to keep themselves motivated to achieve their goals as well. Since there are a great deal of both personal and motivating factors at play within this area of inquiry, Bandura's self-efficacy theory serves as the conceptual framework for the study.

Self-efficacy is broadly described as the learner's own perception and belief in their own ability to achieve a specific task or objective within a specific setting (Bandura, 1977; Bandura, 1989). The self-efficacy of an individual can be highly influenced by a variety of factors including, but not limited to, their personal history, influences or experiences pertaining to the environment in which they find themselves—including pressure, positive or negative reinforcement, or feedback provided by peers or adults and much more. Simulated environments which enable students to have experiences which mirror the real-life experiences they will encounter, such as CDE practices, or training the teacher engages in to be better equipped to coach students, increase the self-efficacy of a learner (Bandura, 1977; Bandura, 1989). As referenced in Figure 1, self-efficacy consists of four key processes: cognitive, motivational, affective, and selection. Since CDE preparation can be a rigorous endeavor depending on the goals of the student participants, and potentially, the teacher's goals (cognitive and affective), and since oftentimes SBAE teachers and FFA members coaching or participating in CDE competitions have a variety of other CDE or LDE competitions, work experiences, academic or athletic obligations, and more (selection processes), this framework applies directly and builds upon to the findings of Spady (1970) since these students and teachers have high aspirations, both intrinsic and extrinsic (motivational), to achieve their goals.

Figure 1

Components of self-efficacy (Bandura, 1989)



Purpose and Objectives

The purpose of this study was to evaluate the level of participation within various CDE competitions hosted throughout the state of Iowa over the course of eight years (2014 through 2022, excluding 2020) through considering a variety of existing, publicly-available data. To achieve this purpose, the following research objectives were developed:

1. To examine the individual and aggregate participation in career development events in Iowa based on demographic indicators.
2. To explore the participation in career development events via distance from each event site's location.

Methods

To examine the growth within CDE competitions within Iowa, no instrumentation or questionnaire development was needed. Instead, an analysis of CDE participation, including event registration data provided by the Iowa FFA Association and chapter locations, was conducted and compiled for data analysis. This data collection and evaluation process was approved by the IRB and followed Knowledge Discovery in Databases (KDD) outlined by Fayyad, et al. (1996). The nine-step process included identifying the goal, creating a target data set, data cleaning and processing, data reduction and projection, matching the goals, and exploratory analysis, and formed the foundations of the methodology for this study (Fayyad, et al., 1996).

The target data set was copied and organized in an Excel spreadsheet. Data was cleaned and linked to chapters located throughout the state. Identifier codes were assigned to each participating chapter to ensure privacy and consistent reporting of results across the different variables that were measured. The data set was collected and analyzed includes a census of 241 chapters across Iowa. When reporting the data, no individual FFA chapter names or any other identifying information were disclosed. In addition, due to the COVID-19 pandemic and some of the CDE competitions not taking place in 2020 or being offered in alternative forms that year, the data from 2020 was excluded from this study's calculations and analysis.

Iowa FFA chapters were ranked in order on the basis of the total number of CDE teams they had participated in the state-level events between the years 2014 and 2022. Each FFA chapter was ranked accordingly in order of highest participation to least participation across CDEs. Iowa FFA chapters in the

top 15 and bottom 15 chapters were determined and additional data regarding the demographics and distance to the six state-level CDE competition locations were gathered and analyzed to assist in meeting the research objectives. Whenever appropriate, descriptive statistics and measures of central tendency, such as minimum, maximum, median, mean, and standard deviation values were calculated.

Results

Objective 1: Demographics

Participation data were organized in descending order to determine the top and bottom 15 participating Iowa FFA chapters. The demographics of the chapters that were identified as top-participants had some key differences when compared to the demographics of the chapters that were identified as bottom-participants. A total of 33% (n = 5) of chapters in the top 15 within CDE participation over the years had multiple teachers in the department, and an average of 17.4 years (σ = 11.14) of experience. On the contrary, an interesting trend is that 0% (n = 0) of the bottom 15 chapters had multiple teachers, and maintained an average of 8.6 years (σ = 8.1) of experience. Grades 9 through 12 school enrollment size for the top 15 chapters averaged 459.0 (σ = 96.7) students compared to the bottom 15, which averaged 221.9 (σ = 25.0) students. In addition, the free and reduced lunch (FRL) rates for schools in the Top 15 and Bottom 15 were calculated (Iowa Department of Education, 2023). Schools within the top 15 had an average 42.4% (σ = 0.20%) FRL rate, while schools in the bottom 15 schools averaged a higher FRL rate of 48.3% (σ = 0.20%) (Table 1).

Table 1

Demographics of Programs

	Min	Max	Median	μ	σ
Number of teachers in program					
Top 15	1.0	4.0			
Bottom 15	1.0	1.0			
Years of teaching experience					
Top 15	1.0	40.0	13.0	17.4	11.1
Bottom 15	1.0	21.0	4.0	8.6	8.1
Size of school (9-12 enrollment)					
Top 15	145.0	1489.0		459.0	96.7
Bottom 15	82.0	586.0		221.9	25.0
Free and reduced lunch (FRL)					
Top 15	21.7	94.5		42.4%	0.20%
Bottom 15	25.7	86.8		48.3%	0.20%

All of the data collected takes into account the last eight years of data, with the exclusion of 2020 due to the COVID-19 pandemic. Statewide participation in CDEs has continued to see a steady growth with an average range of teams participating in events from 15.1 to 86.4 teams in each event. The events seeing the largest average numbers of teams participating each year within the state includes farm business management (n = 86.4), poultry (n = 86.0), agricultural sales team (n = 62.0), and agricultural biotechnology (n = 47.3). Within the Iowa CDE rules, each chapter is able to register one team to participate in a state CDE. The CDEs having the lowest state average includes vet science (n = 17.3), marketing plan (n = 17.0), meats (n = 17.0), agricultural communication (n = 15.8), and food science (n = 15.1) (Table 2). Participation in CDE competitions statewide has continued to increase each year with participation; 2014 saw 419 teams compete at the state-level, with an average of 28.06 teams participating in each event. By 2022, however, there were 735 teams participating across all CDEs, and on average, 40.83 teams participating in each event (Table 3).

Table 2

Participation in career development event (CDE) competitions by year

CDE Event	2022	2021	2019	2018	2017	2016	2015	2014	Average Number of Teams in CDE
Farm Business Management*	100	93	85	83	83	85	83	79	86.4
Poultry*	117	94	110	88	75	67	51	N/A	86.0
Agricultural Sales Team*	79	63	73	59	58	56	53	55	62.0
Agricultural Biotechnology*	62	54	49	54	42	39	32	N/A	47.3
Livestock	47	44	36	36	43	40	48	45	42.4
Horse	38	26	33	25	23	49[1]	26	33	31.6
Soil	28	30	30	29	30	29	29	28	29.3
Agronomy	21	23	25	35	31	34	27	28	28.0
Agricultural Mechanics	32	24	25	23	25	30	27	29	26.9
Floriculture	41	30	24	18	24	22	22	20	25.1
Dairy Cattle	28[1]	31[1]	14	18	24	14	17	16	20.3
Milk Quality	33[1]	34[1]	13	15	20	11	15	14	19.4
Vet Science	20	24	23	21	15	13	11	11	17.3
Marketing Plan*	19	20	19	21	9	12	18	18	17.0
Meats	13	15	9	17	21	17	26	19	17.1
Agricultural Communication*	20	14	17	16	13	10	16	20	15.8
Food Science	19	13	12	15	14	14	14	20	15.1

*Note: CDE data for 2020 was excluded due to COVID-19; * = At State Leadership Conference (a school day); [1] = On a school day vs. not on a school day.*

Table 3

Total team and average team participation by year

Year	Total Teams Participating	Average Number of Teams for Year
2022	735	40.83
2021	647	35.94
2019	610	33.89
2018	584	32.44
2017	560	31.11
2016	552	30.67
2015	527	29.28
2014	449	28.06

Note: The impact COVID-19 on 2020 data caused that year to be excluded from data analysis

Objective 2: Miles Traveled

Participation data were organized in descending order to determine the top and bottom 15 participating Iowa FFA chapters. The total number of miles that would need to be traveled to events by top participating chapters on an annual basis ranged from 320.3 to 1,558 miles. The average total number of miles needed to travel to a CDE event by the top participating chapters was 853.5 miles (Table 4). The bottom participating chapters saw a narrower range in reported values for miles traveled to state CDEs, with a minimum of 408.2 miles to a maximum of 1,401 miles. The average number of miles to needed travel to CDEs by bottom participating chapters was 859.2 miles (Table 5).

Table 4

Top 15 participating chapters' miles needed to travel to participate in state CDE competitions

ID Number	City 1	City 2	City 3	City 4	City 5	City 6	Total Miles Traveled
512401	226	226	327	226	315	226	1558.0
512391	199	199	300	199	288	199	1384.0
510461	162	162	263	162	252	162	1163.0
527481	185	185	80.0	185	98	185	918.0
527611	171	171	65.8	171	100	171	852.8
520451	172	172	66.8	172	28.7	172	783.5
520401	163	163	68.9	163	19.6	163	740.5
520331	159	156	54.2	159	33.6	159	723.8
520421	160	160	65.3	160	14.6	160	719.9
523621	151	151	46.0	151	50.0	151	699.9
525531	102	102	106	102	153	102	667.0
506441	124	124	44.8	124	24.2	124	565.0
502471	29.5	29.5	79.6	29.5	120	29.5	320.3

Table 5

Bottom 15 participating chapters' miles needed to travel to participate in state CDE competitions

ID Number	City 1	City 2	City 3	City 4	City 5	City 6	Total Miles Traveled
516521	206	206	285	206	341	206	1401.0
510391	151	151	252	151	241	151	1097.0
515591	146	146	225	146	281	146	1041.0
510161	137	137	237	137	226	137	1011.0
505851	133	133	233	133	222	133	987.0
526541	171	66.1	171	113	171	113	863.1
521321	168	168	101	168	65.1	168	838.0
500601	109	109	163	109	210	109	809.0
504501	114	114	179	114	168	114	803.0
506281	53.1	53.1	106	53.1	94.7	53.1	801.0
514431	57.0	57.0	162	57.0	198	57.0	591.0
505251	57.0	57.0	151	57.0	140	57.0	519.0
505951	36.3	36.3	137	36.3	126	36.3	408.2

Discussion, Conclusions, and Recommendations

Conclusions

Objective 1: Participation in CDEs based on demographic indicators

Statewide participation within CDEs has steadily increased in total and within individual CDE competitions. Over the last two years examined within this study, 11 of the 17 CDEs experienced the highest number of teams participating within the event, indicating increased engagement and participation by students and FFA chapters. This steady growth of participation can be viewed as a benefit and opportunity for students to continue to grow in the various agricultural career areas. A positive of this growth is noted by Roberts and Dyer (2004), as the facilitation and preparation of teams is a trademark of effective SBAE teachers. Effective teachers will teach content within the classroom and have students apply the learned agricultural content in CDE events (Goodwin & McKim, 2020; Roberts & Dyer, 2004). However, there are still several CDE areas in which there is considerably lower participation within Iowa, including food science, agricultural communications, and meats evaluation; these findings are consistent with those of Harris (2008).

Students who have the opportunity to participate in CDE events are able to see another aspect of agricultural education and apply the learned knowledge which they have gained through their SBAE classes. Terry and Briers (2010) identified the preparation of CDE teams as one of the top ten responsibilities of SBAE teachers. On top of being a key responsibility of an SBAE teacher, CDEs are an opportunity for teachers to guide student development through setting goals and building confidence within themselves through establishing self-efficacy (Bandura, 1989). This growth will occur at various times throughout the process no matter if it is in the classroom learning content, in preparation for the CDE, during the CDE, or in reflective processes after the CDE (Goodwin & McKim, 2020). Furthermore, students or teachers who experience success participating in or coaching teams for CDE or LDE competitions may find this as another positive source of both cognitive and affective processes, and increase their self-efficacy, confidence, and desire to try or coach additional competitions in the future (Bandura, 1989).

Objective 2: Participation in CDEs via distance from each event site's location

CDE events with the most participation took place during a school day and at the state leadership conference. The four CDEs being participated in most heavily included farm business management, poultry, agricultural sales team, and agricultural biotechnology. Interestingly, all four of these CDEs take place during the state leadership conference, as this is a convenient opportunity for students and teachers alike to take advantage of multiple competitions at just one event, as opposed to driving far distances for only one or two CDE opportunities. Economic barriers may still be underlying participation trends, but the average number of miles that would need to be traveled by the top- and bottom-participating chapters to a CDE was marginal, so the travel distance may not be as significant of a barrier for a chapter to participate as initially thought. Additional research should be conducted in other states to see if similar patterns emerge. Further, work-life balance can play a role in this as well; longer distances that need to be traveled generally correlate with early mornings and late nights needed to get students to their competitions, or potentially time away from family for overnight trips. In a time when work-life imbalance continues to be problematic for educators across all career stages (Lemons et al., 2015; Smith & Smalley, 2018), we can explore ways we can make minor changes to the structure of CDEs or LDEs that may help preserve teacher work-life balance within the profession.

Recommendations

Based on the results, recommendations have been developed to assist in developing plans for professional practice and research. One professional recommendation that can be evaluated on a state-level is the inclusion of virtual pre-qualifying events. Since SBAE teachers have developed competency in utilizing online platforms during and after the COVID-19 pandemic (Eck et al., 2021), pre-event virtual qualifiers where students complete the exams or practicum portions that can be facilitated from a distance

online weeks before the actual in-person event, potentially as a way to "screen" or further limit the number of teams needing to travel to an in-person event, thereby lowering the number of miles traveled to the actual competitions since fewer teams would need to travel, and limiting the amount of time teachers traveling and away from their families, helping preserve work-life balance (Lemons et al., 2015; Smith & Smalley, 2018). This is especially relevant as the findings revealed that some schools could travel upwards of 1,558 miles in one year alone just to compete. Virtual portions of the events could be proctored by trusted adults. Further, if virtual components are to be implemented despite all teams being allowed to advance to the full, in-person event, this recommendation could still lower the amount of time spent on-site for the actual event and ensure teachers are able to return their students back to school at a reasonable hour, or potentially starting the events a little later in the day. National FFA has recently used virtual qualifying events for events such as agricultural communications, employment skills, and parliamentary procedure (National FFA Organization, 2023).

In addition, while not studied explicitly within this study, teachers indicate a desire for additional professional development in CDE and LDE coaching (Bowling & Ball, 2020; Harris, 2008). Perhaps if additional professional development is offered in specific content areas that have CDE or LDE competitions, or additional professional development is offered regarding specific coaching strategies or best practices, this will increase engagement in CDE and LDE opportunities further, as teachers build their own self-efficacy toward coaching or specific CDE or LDE areas (Bandura, 1989). This is especially true since the findings of this study revealed that the bottom 15 chapters generally had fewer SBAE teachers within their programs, with all 15 having only one SBAE teacher responsible for leading the program. If those in single-teacher programs are expected to coach upwards of 15 CDE or LDE teams each year (Lundry et al., 2015), professional development to increase teacher confidence within these respective events can lead to less pressure or more efficiency in coaching the events.

Finally, an additional professional recommendation is to provide resources for local SBAE teachers to learn how to leverage the expertise, time, or resources of local advisory board members, program alumni, or community experts to coach teams, or bring them to competitions so they can stay in the classroom instead of needing a sub from time to time. While FFA competitions are an opportunity to build relationships with students and connect with other teachers, the hours and miles invested into taking CDE and LDE teams to their events throughout the year can take a toll on a teacher. Helping teachers find capable individuals to take one item off their plate, especially during busy times of the year, might lead to reduced burnout among teachers while fostering meaningful connections between teachers and key resources that lie within their communities. Further, this strategy can improve the teachers' selection processes (Bandura, 1989) and increase their self-efficacy and confidence in coaching CDE or LDE teams as a result (Bandura, 1989). A questionnaire template could be developed and distributed statewide to alumni or agricultural companies, and also to teachers so they can send it out within their individual communities, in order to develop a database of willing and capable individuals to support local FFA chapters in these CDE-related capacities. Further, these individuals could assist in lessening the load of agricultural educators, allowing them to prioritize work-life balance (Lemons et al., 2015; Smith & Smalley, 2018).

We recognize that a limitation of this study is that we only examined trends within one state over only eight years; future research should be done on other states over longer time periods to verify trends. Future research should also focus on why we are seeing an increase in CDE participation across the state. Factors that need to be explored further include: if a teacher's motivation influences participation, if a teacher's age influences participation, if the coaching strategies of teachers from top participating schools versus bottom participating school are different, if participation varies if the events are held on a school day versus out of school time, and investigating any other barriers that may keep additional chapters from participating. These areas of inquiry can be explored using a questionnaire, a series of student or teacher interviews or focus groups, or a combination of these quantitative and qualitative methods. Findings can inform additional professional practices or lead to additional research about CDEs and LDEs.

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