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Teacher Philosophies of Career Development Events: Implications for Curriculum in Agriculture, Food, and Natural Resources Education

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Abstract

Student engagement in Career and Technical Student Organizations (CTSOs) offer tremendous opportunities for content learning, leadership development, and career preparation. Included in the scope of CTSOs are skills contests, competitions designed to test student knowledge and skills within respective content areas. Within school-based agricultural education, these skills contests are called career development events (CDEs). Building upon existing research identifying the importance of CDE preparation to student performance and knowledge transfer, the current study quantified CDE preparation occurring within agricultural education classrooms, educator philosophies of CDEs, and the relationship between philosophies and CDE preparation. Findings indicate the majority of responding teachers held a student development philosophy and incorporated moderate to high amounts of CDE preparation within their classroom curriculum. Additionally, findings suggest a practically significant relationship between teacher philosophies and CDE preparation, with teachers possessing a competition and achievement philosophy facilitating the highest amount of CDE preparation during classroom instruction. In total, findings provide important insights into CDE preparation within agricultural education as well as a template for evaluating similar relationships throughout other CTE areas.

Keywords: career development events; classroom extension; competition and achievement; FFA; student development

Introduction

Career and Technical Student Organizations (CTSOs) are a major component of Career and Technical Education (CTE) (Threeton & Pellock, 2010). Aligned with school-based agricultural education (SBAE), the National FFA Organization is one of eight nationally recognized CTSOs. Common within CTSOs, like FFA, are opportunities for students to experience leadership development through community engagement and apply content via participation in skills contests (Alfeld et al., 2007). Within FFA, these skills contests are commonly identified as career development events (CDEs), experiences designed to provide a competitive atmosphere for students to demonstrate knowledge and skills related to a range of agriculture, food, and natural resources topics (National FFA, 2016).

Student growth and development can occur in preparation for, engagement during, and reflection upon the CDE competitions. The literature, however, is scarce of empirically-grounded strategies for CDE preparation. Previous investigations suggest two ends to the preparation spectrum, one in which teachers prepare students for CDEs completely outside the context of the classroom (Melodia & Meyer, 2001) and the other in which teachers accomplish all CDE preparation during regularly-scheduled classroom hours (Beekley & Moody, 2002). In a recent investigation, Pauley

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(2019) found CDE preparation strategies were related to student ranking in the CDE as well as performance on higher-order elements of the CDE. In the study by Pauley, CDE preparation which occurred within the context of the classroom was related to better performance on the CDE as a whole as well as the higher-order elements of the contest. These findings illuminate CDE preparation as an important variable to contest success as well as success outside the context of the contest. Thus, the current study focuses on the diversity of preparation strategies utilized by SBAE teachers in Michigan.

In addition, a potential predictor of CDE preparation strategies, philosophy of CDEs, was considered within the current study. To do this, a review was conducted of outcomes SBAE teachers expect from CDE participation to construct potential philosophies of CDEs. Of note, this review found CDE outcomes anticipated by teachers are vast (Ball et al., 2016; Russell, Robinson, & Kelsey, 2009); however, three main themes of outcomes emerged: a) student development, b) classroom extension, and c) competition and achievement. The three themes, described below, were used to construct the philosophies of CDES included in the current study.

Student Development

When considering CDEs, SBAE teachers identify opportunities for student development as drivers of participation (Ball et al., 2016; Russell et al., 2009). As a primary goal of CDEs is to develop career readiness skills (National FFA, 2016), many SBAE teachers indicate development of career-specific knowledge and skills is a motivating factor of participation (Ball et al., 2016; Russell et al., 2009). In a study by Russell et al. (2009), one SBAE teacher stressed skills demonstrated in CDEs are "some of the skills that they [students] will carry right on into their colleges and careers" (p. 111). Additionally, the application of diverse knowledge bases, such as science and mathematics, to the CDE context encourages students to make connections between core subject area knowledge and career-specific tasks (Ball et al., 2016) which benefits students in their future careers.

While the focus of CDEs is career development, SBAE teachers also cite the importance of leadership and life skill development through CDE participation (Ball et al., 2016; McKim et al., 2017; Russell et al., 2009). In their 2017 study, McKim and colleagues found SBAE teachers intended to teach leadership in over 65 percent of FFA experiences, thus illuminating the value of leadership development among FFA experiences, in which CDEs are included. Literature specifically related to leadership development through CDEs identifies various leadership skills, such as teamwork and conflict management, as outcomes of CDE participation (Russell et al., 2009).

In addition to leadership development, SBAE teachers identify the occurrence of life-skill development through CDEs (Ball et al., 2016; Russell et al., 2009). Attributes such as pride (Ball et al., 2016; Russell et al., 2009), confidence, and responsibility, and skills such as public speaking and interviewing (Russell et al., 2009) are identified as specific life-skill developmental outcomes.

Classroom Extension

The role of CDEs in support of classroom curriculum is supported by the National FFA Organization (2016), which states, "Events [CDEs] are intended to be an outgrowth of instruction" (p. iii). The value of CDE participation as an extension of classroom learning is confirmed by SBAE teachers who indicate CDEs provide opportunities for students to apply knowledge and skills gained during classroom instruction (Edwards & Booth, 2001; Russell et al., 2009). Additionally, CDEs provide context for student learning of agricultural career-related and core academic subject area knowledge and skills (Russell et al., 2009). Another opportunity valued by SBAE teachers is the opportunity to assess student knowledge and skills. In a case study, Ball et al. (2016) found an SBAE teacher assessed student learning during CDE preparation to identify areas where more scaffolded

instruction was required as well as to identify students who could engage in peer teaching of team members.

Competition and Achievement

In addition to student development and learning outcomes, SBAE teachers indicate competition and achievement as a motivating outcome of CDE participation (Ball et al., 2016; Russell et al., 2009). In fact, SBAE teachers participating at the national level indicate competition is the most important reason for student participation in CDEs, with over 86 percent of teachers labeling competition as important or very important (Croom et al., 2009). CDEs provide copious opportunities for students to compete, including during events, practices, and even tryouts for the team (Ball et al., 2016); however, competition during events provides most opportunities to formally recognize student success, which are measured by ranking at the conclusion of each event (Michigan FFA, 2017; National FFA, 2016). Rankings are then used to present awards such as certificates, award pins, or plaques to students and SBAE programs for their success (Michigan FFA, 2011).

Such awards for achievement play a role in student motivation for participation in CDEs (Russell et al., 2009); however, students do not only compete for material tokens. High achievement in CDEs is sometimes rewarded with opportunities for future success in the form of scholarships and industry recognition. For example, the Michigan SBAE student placing first in the agriculture, food, and natural resources education CDE receives a scholarship to Michigan University for the pursuit of an SBAE degree (Everett et al., 2018). In addition to scholarships, high ranking students may also receive industry recognition in their preferred career field as CDEs are developed with input from relevant industry partners (National FFA, 2016) who encourage their employees to assist with the judging of various events. Students may also benefit from showcasing their achievement on their resumes and during interviews, indicating attainment of career-specific ability and knowledge to potential employers.

In addition to individual student recognition, high placings in CDEs provide opportunities to build a reputation of success for SBAE programs and their schools. Top placings at state and national-level events earn SBAE programs banners or trophies, which are often displayed in the classroom or the school building (Russell et al., 2009). The display of tokens won encourages students and SBAE teachers to continue the pursuit of high ranks in CDEs (Russell et al., 2009), thus increasing competition to maintain the tradition of success.

Theoretical Framework

Bronfenbrenner's (1979, 2005) Ecological Systems Theory was used as the theoretical framework for this analysis. Ecological Systems Theory posits dynamic, multidirectional, and nested systems impacting human development. These systems include the microsystem, the center of the concentric systems, followed by the mesosystem, exosystem, and macrosystem respectively. In detailing the Ecological Systems Theory, Bronfenbrenner described three models for operationalizing the theory within research. The first, process models, are structured to evaluate the relationship between systems and the person. The second, process-context models, explore interactions within various systems, but do not include the relationships between those interactions and the individual's characteristics (e.g., gender, age, achievement). The final, process-person-context models, extends the process-context model by including personal characteristics of the individual within the analysis. The current study leverages a process-context approach by exploring the philosophy of CDEs held by teachers (i.e., mesosystem), the inclusion of CDE preparation within classroom curriculum (i.e., microsystem), and the interaction between these two variables. By exploring the broader system of

CDE preparation, this approach builds upon the foundation of research provided by Pauley (2019), which indicates CDE preparation is related to student achievement.

Purpose and Objectives

The purpose of the current study was to understand CDE preparation strategies, educator philosophies of CDEs, and the relationship between CDE preparation and educator philosophies among SBAE teachers in Michigan. To achieve this purpose, the following research objectives were developed.

1. Determine the philosophy of CDEs held by Michigan SBAE teachers.
2. Explore CDE preparation strategies among Michigan SBAE teachers by determining the overlap between CDE contests and curriculum.
3. Describe the relationship between philosophy of CDEs and overlap between CDE contests and curriculum among Michigan SBAE teachers.

Methods

The population for the current study included all SBAE teachers in Michigan during the 2017-2018 school year (N = 131). To conduct the census, contact information for the target population was obtained from the State Director for Agricultural Education. Frame error limited the number of potential respondents to 127. All 127 potential respondents were sent up to five points of email contact inviting them to participate in the research study (Dillman, 2007). Data collection occurred between April and June 2018, following completion of the 2018 Michigan "Agricultural Skills CDE Day," in which the large majority of CDE competitions are held. In total, 92 useable responses were collected from potential responses, equaling a 72% response rate.

To evaluate non-response bias, on-time respondents (i.e., those responding within the first three points of contact) were compared to late respondents (i.e., those responding after the final two points of contact) using an independent samples *t*-test for the variables of interest (i.e., philosophy of CDEs and CDE-curriculum alignment. Results indicated no statistically significant differences between the two groups; therefore, non-response bias was not considered an issue for the current study (Lindner et al., 2001). Further, respondent demographics were determined to be similar to the known demographics of the population, supporting a lack of non-response bias within the data.

Instrumentation

Philosophy of CDEs

The first section of the instrument was the researcher-constructed philosophy of CDEs item which asked respondents to rank nine outcomes of CDE participation (i.e., apply classroom learning, assess student proficiency, build/maintain a reputation of success, compete and/or win, develop career-specific knowledge, develop career-specific skills, develop leadership and life skills, provide a context for learning, and provide student recognition), from 1 (*most important*) to 9 (*least important*). The nine outcomes of CDE participation included in the construct were adapted from Ball et al. (2016) and Russell et al. (2009), who, in their respective studies, identified the outcomes as motivating factors for involvement in CDEs. Both Ball et al. (2016) and Russell et al. (2009) identified competition, student recognition, and development of leadership and life skills as motivating outcomes of CDEs, while Russell et al. (2009) recognized outcomes of maintaining traditions of success, providing a context for learning, applying classroom learning, and assessing student knowledge. Additionally, outcomes of career-specific knowledge and skills were identified by Ball et al. (2016).

The ranking of outcomes associated with CDE engagement was utilized to determine the respondent's philosophy of CDEs. Three specific domains existed within the philosophy of CDEs item, (a) student development, (b) classroom extension, and (c) competition and achievement. Additionally, each domain was comprised of three related outcomes. The three domains representing general philosophies of CDEs were synthesized from existing literature (Ball et al., 2016; Russell et al., 2009) and may not fully represent the CDE philosophy of each Michigan SBAE teacher. However, a review of additional literature related to CDE preparation (Beekley & Moody, 2002; Edwards & Booth, 2001) reveals similar outcomes represented among the three identified philosophies; therefore, the three domains are considered representative of current understanding of SBAE teacher CDE philosophy. A table of outcomes and associated domains is found in the data analysis section below.

It is important to note the construction of the philosophy of CDEs item asked respondents to rank the nine outcomes of CDEs in order of importance rather than identify one of the three philosophies of CDEs. This process was intended to limit the possibility of response bias related to respondents self-selecting the philosophy which they felt sounded most appealing, thus allowing for a more authentic representation of Michigan SBAE teacher thoughts and attitudes toward purposes for CDE engagement.

Career Development Event and Curriculum Scale (CDECS)

The second section of the survey measured respondents use of CDEs within their classroom curriculum using a researcher-developed construct, the CDECS. For this construct, respondents rated their agreement with four statements from 0 (strongly disagree) to 100 (strongly agree) with larger numbers representing higher use of CDEs within classroom curriculum. Example items within the construct can be found within the findings, table five.

Validity and Reliability

A panel of experts in SBAE and social sciences research were used as the panel of experts for the data collection instrument. The panel evaluated face and content validity and their feedback was used to increase the quality of the data collection instrument (e.g., clarity in wording). In addition, the CDECS construct was pilot tested among SBAE teachers in a neighboring state with results indicating the construct was reliable among a sample of SBAE teachers (Cronbach's Alpha = .72; Fraenkel & Wallen, 2000). Furthermore, post hoc reliability estimates among the sample used for the current study indicated construct reliability (Cronbach's Alpha = .85; Fraenkel & Wallen, 2000).

Data Analysis

Objective One

Research objective one, determining the philosophy of CDEs held by Michigan SBAE teachers, was accomplished using the philosophy of CDEs measure. First, each of the nine outcomes of CDEs ranked in the measure were aligned to one of three general philosophies of CDEs, (a) student development, (b) classroom extension, and (c) competition and achievement (see Table 1). The three general philosophies of CDEs were synthesized from findings related to motivations for engaging students in CDEs (Ball et al., 2016; Russell et al., 2009), as discussed previously in the instrumentation section.

Table 1
CDE Outcome Items Linked to General Philosophy of CDEs

Outcome Item	Philosophy of CDEs
Apply classroom learning.	
Assess student proficiency.	Classroom Extension
Provide a context for learning.	
Build/maintain a reputation of success.	
Compete and/or win.	Competition and Achievement
Provide student recognition.	
Develop career-specific knowledge.	
Develop career-specific skills.	Student Development
Develop leadership and life skills.	

Note. Adapted from Ball et al. (2016) and Russell et al. (2009).

For each respondent, the rank of CDE outcomes associated with each general philosophy of CDEs was summated. The philosophy category which received the lowest summated score (i.e., highest original rank) was recorded as the respondent's general philosophy of CDEs. Tied scores were broken by recording the philosophy category associated with the top ranked outcome item as the respondent's general philosophy of CDEs. An example of the process is provided below (see Table 2). Descriptive statistics were utilized to describe the mean ranks of outcome items and the distribution of each general philosophy of CDEs among the sample.

Table 2
Example Ranking Process to Determine General Philosophy of CDEs

	Respondent 1			Respondent 2			Respondent 3		
Ranked Item	Ext.	Comp.	Dev.	Ext.	Comp.	Dev.	Ext.	Comp.	Dev.
Apply	1			2			4		
Assess	2			6			5		
Context	4			5			6		
Ext. Total	**7**			**13**			**15**		
Reputation		6			1			9	
Competition		5			3			7	
Recognition		9			9			8	
Comp. Total		**20**			**13**			**24**	
Knowledge			7			7			3
Skill			3			4			2
Leadership			8			8			1
Dev. Total			**18**			**19**			**6**
General Philosophy	Classroom Extension			Competition and Achievement			Student Development		

Note. In the table, general CDE philosophy domains are abbreviated (i.e., "dev." indicates student development, "ext." indicates classroom extension, and "comp." indicates competition and

achievement) as well as items within each domain. See Table 3 for the complete item names. Additionally, the tie score between the "ext." total and "comp." total for respondent two was broken by identifying the top-ranking item (i.e., reputation) and recording the domain in which the item exists (i.e., competition and achievement).

Objective Two

To accomplish objective two, evaluating the overlap between CDEs and curriculum, the CDECS construct was utilized. Construct items were averaged to determine an overall alignment, reported on a scale from 0% (*completely unaligned*) to 100% (*completely aligned*). For the purposes of the current study, CDECS alignment from 0-40 is referred to as 'minimal, 40-70 'moderate,' and 70-100 'extensive.' A CDECS alignment was recorded for each respondent and the average score for respondents is described in the findings.

Objective Three

Research objective three sought to describe the relationship between philosophy of CDEs and CDECS. A one-way ANOVA was used to analyze the relationships between philosophy of CDEs and CDECS alignment. Effect sizes were established as "small effect," Cohen's $d = .20$; "medium effect," Cohen's $d = .50$; and "large effect," Cohen's $d = .80$ (Cohen, 1988). Inferential statistics are reported for each relationship; however, these findings should not be generalized due to low in-group sizes.

Results

Objective one sought to determine the CDE philosophies of Michigan SBAE teachers. First, average rankings for the nine CDE outcomes are provided in Table 3. The highest ranked outcome was categorized in the classroom extension category (i.e., apply classroom learning $M = 3.14$, $SD = 1.90$); however, the next three outcomes all fell within the student development category (i.e., develop leadership and life skill $M = 3.21$, $SD = 2.15$; develop career-specific skills $M = 3.47$, $SD = 1.69$; develop career-specific knowledge $M = 3.64$, $SD = 1.85$). The three lowest rated outcomes all fell within the competition and achievement category.

Table 3
Michigan SBAE teachers' Ranking of CDE Outcomes

	M	*SD*	Min	Max
Classroom Extension				
Apply classroom learning.	3.14	1.90	1	9
Provide a context for learning.	3.96	2.00	1	9
Assess student proficiency.	5.84	1.97	1	9
Competition and Achievement				
Provide student recognition.	6.90	1.69	2	9
Build/maintain a reputation of success.	7.18	1.87	1	9
Compete and/or win.	7.66	1.87	1	9
Student Development				
Develop leadership and life skills.	3.21	2.15	1	8
Develop career-specific skills.	3.47	1.69	1	8
Develop career-specific knowledge.	3.64	1.85	1	9

Note. Values represent ranked items from 1 (*most important*) to 9 (*least important*); therefore, lower means indicate higher ranked, more important, outcomes.

Table 4 identifies the percentage of SBAE teachers in Michigan by CDE philosophy. The largest percentage of teachers possessed the student development philosophy (63.0%) followed by classroom extension (32.6%) and competition and achievement (4.3%).

Table 4
Michigan SBAE teachers' Philosophy of CDEs

	f	%
Student Development	58	63.0
Classroom Extension	30	32.6
Competition and Achievement	4	4.3

In research objective two, the alignment between CDE preparation and classroom instruction was explored. Findings suggest, overall, SBAE teachers in Michigan had moderately high levels of CDE use within their classroom curriculum ($M = 70.28$, $SD = 21.08$).

Table 5
Alignment Between the CDE and Curriculum

	M	*SD*	Min	Max
I conduct a replication of the CDEs for students to complete during classroom instruction.	66.67	30.53	0.00	100.00
All students in the program receive the same instruction of *content* regardless of whether or not they participate in the CDEs.	70.13	30.89	0.00	100.00
All students in the program receive the same instruction of *applied skills* regardless of whether or not they participate in the CDEs.	69.86	30.35	0.00	100.00
I include problem-solving components of the CDEs in classroom instruction of content and skills.	73.53	24.28	14.00	100.00
CDECS	70.28	21.08	9.50	100.00

Note. Alignment was measured using the CDECS and is reported on a scale from 0 (*completely unaligned*) to 100 (*completely aligned*).

In the final research objective, the relationship between SBAE teachers' philosophy of CDEs and their inclusion of CDE preparation within classroom curriculum was evaluated. Average CDECS scores ranged from those teachers reporting a competition and achievement philosophy ($M = 79.15$, $SD = 15.67$) to those reporting a student development philosophy ($M = 68.08$, $SD = 22.56$). Comparison of the three groups, however, yielded no statistically significant differences between the three groups ($F = 0.87$, p-value = .422).

Table 6
Relationship Between Philosophy and Alignment

	M	*SD*	*df*	*F*	*p*	η
Philosophy of CDEs			2	0.87	.422	.150
Classroom Extension	73.25	18.50				
Student Development	68.08	22.56				
Competition and Achievement	79.15	15.67				

Note. Means indicate average alignment between the CDEs and classroom curriculum as measured using the CDECS, which ranges in scale from 0% (*completely unaligned*) to 100% (*completely aligned*).

Discussion

The current study sought a better understanding of the relationship between elements of the three-circle model of SBAE; specifically, the overlap between CDEs and classroom curriculum among a state-level sample of SBAE teachers. Findings provide new insights into how teachers operationalize this overlap within their curriculum as well as how this overlap relates to teachers' philosophy of CDEs. Given the prominence of skills competitions in CTE, the current research also provides a template for other CTE disciplines to evaluate similar relationships.

In research objective one, the philosophy of CDEs held by Michigan educators were explored. While findings indicate Michigan SBAE teachers value the application of classroom learning as the most important outcome of CDEs, the majority of Michigan SBAE teachers hold a student development philosophy, more consistently ranking outcomes associated with the development of leadership, life,

and career-specific knowledge and skills as more important CDE outcomes. Additionally, the philosophy of CDEs held by the fewest Michigan SBAE teachers was competition and achievement, indicating outcomes such as competition and winning, developing a reputation of success, and providing student recognition are not as important as opportunities for student development or classroom extension. Findings related to the philosophies of CDEs held by Michigan SBAE teachers contradict findings of Croom et al. (2009). In their study, Croom and colleagues (2009) found SBAE teachers with teams at national level CDEs indicate competition as the most important reason for student participation in CDEs. The discrepancy between findings may be explained by the level of competition in which SBAE teachers engage their students, with those advancing to the highest level of competition (i.e., national-level CDEs) valuing competition more than those who participate in more local-level CDEs. However, the current study did not differentiate between SBAE teachers who had advanced to national competitions and those who had not.

In research objective two, the overlap between CDE and curriculum was explored. Teachers reported an average overlap of 70.28, indicating CDEs were being used at a moderate to extensive level within SBAE curriculum. This finding adds empirical evidence to the professional debate regarding the use of CDEs in the classroom, siding with the work of Beekley and Moody (2002) who suggested teachers use CDEs as a classroom learning tool. Importantly, the high standard deviation (SD = 21.08) and range of responses (Range = 9.50 to 100.00) associated with the average CDECS score indicate teachers fall throughout the spectrum of CDE usage within their curriculum.

In the third research objective, the relationship between philosophy of CDEs and CDECS was evaluated by comparing the mean CDECS by reported philosophy. While not statistically significant, researchers suggest the findings are practically significant. Teachers with the student development philosophy recorded an average CDECS score more than 10 points below those with a competition and achievement philosophy, suggesting CDE philosophy is an important teacher characteristic shaping the learning experiences of students. Findings imply those teachers with a competition and achievement philosophy are more likely to integrate CDE competitions within their classroom whereas those with a classroom extension or student development philosophy appear more likely to reserve CDE preparation for outside of the classroom. Importantly, however, each of the three philosophies yielded relatively high CDECS scores, suggesting none of the philosophies precluded teachers from incorporating CDEs within their classroom curriculum.

The practical relationship between CDE philosophy and CDECS supports the relationships posited within the Ecological Systems Theory (Bronfenbrenner, 1979, 2005). Specifically, the philosophy held by teachers (i.e., an element of the learners' mesosystem) relates to the learning environment (i.e., an element of the learners' microsystem), measured by the CDECS, of the students. In addition to supporting the theoretical foundation of nested and related systems, findings support the use of the process-context approach to operationalizing the Ecological Systems Theory, implying a systems approach to understanding individual learning and achievement is valuable.

Though the previous findings are supported by the data, it is important to note, due to small sample sizes, findings should not be generalized to other populations or contexts. Additionally, while practical significance existed among relationships of interest in objective three, no statistically significant findings resulted from the study. Therefore, in addition to teacher philosophies, other variables outside the study's scope are likely to be related to the outcomes of interest. However, conclusions and recommendations, provided below, are based on the practically significant relationships identified within the current study.

Conclusions and Recommendations

With an intent to better understand overlap between CDEs and curriculum as well as the relationship between this overlap and teacher philosophies of CDEs, the current study yielded three main conclusions. These three conclusions are described below alongside recommendations for practice and research.

First, findings suggest student development is the most common CDE philosophy among Michigan SBAE teachers. The student development CDE is defined by teachers placing an emphasis of developing learners' leadership skills and career-specific skills and knowledge. Given the prominence of the student development philosophy, stakeholders to SBAE in Michigan are encouraged to market opportunities, like CDEs, as an opportunity to achieve student development. Additionally, qualitative research is recommended to gain a deeper understanding of each of the three CDE philosophies and how each philosophy influences the decisions and actions of SBAE teachers beyond CDE and curriculum overlap.

Second, a high overlap was found between CDEs and curriculum. This finding suggests, on average, teachers find utility in using CDEs within their classroom. However, results also indicate a range of CDECS scores among teachers. Therefore, additional research is recommended to identify *why* some teachers utilize CDEs extensively within their curriculum while others do so at a much lower level. In addition to understanding why, research is needed to understand the outcomes of CDE and curriculum alignment, including student academic performance, teacher work-life balance, and opportunities for STEM integration within SBAE curriculum.

Third, the practically significant relationship between teacher philosophy and CDECS suggest the importance of teacher CDE philosophy to the learning experiences of students. However, researchers do not presume CDE philosophy is the only influence on CDE and curriculum overlap. Therefore, research is needed to explore additional variables which may influence the CDECS scores of teachers. Within these investigations, a systems perspective is critical, in which elements of learners' microsystem, mesosystem, exosystem, and macrosystem are considered (Bronfenbrenner, 1979, 2005). Additionally, process-person-context models, which include analyses of learner differences, are encouraged. Finally, recognizing the importance of teachers' philosophical beliefs and student learning experiences, we recommend similar research be conducted throughout CTE areas, including, but not limited to, SBAE.

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