

The Future of CTE Teacher Preparation Programs in Florida's Universities

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Introduction

Career and technical education (CTE) teacher preparation programs prepare subject matter experts to teach career-themed courses at the secondary and postsecondary levels. Course objectives and curriculum provide prospective CTE teachers pedagogical knowledge and best teaching practices, which in turn produce quality teachers. Research has revealed a positive relationship between teacher quality and student learning outcomes (Darling-Hammond, 2000). More specifically, Darling-Hammond's (2000) study noted professional teacher education has been identified as a key factor in quality teachers which, in turn, helps to create positive student outcomes across all 50 states. The sustainability of CTE teacher preparation programs is necessary to produce effective teachers.

Problem Statement and Purpose of Study

CTE programs have seen increased student enrollments in the past decade. From 2013/14 to 2015/16 school years, Florida's career and technical education (CTE) student enrollment increased by approximately 20% in Grades 6 through 12 (Florida Department of Education, 2017). With a student enrollment increase in career-themed courses, one would surmise an increase in CTE teacher education programs would occur to support the additional workload. However, CTE teacher preparation Bachelor degree programs have been steadily decreasing since the 1990s (Bruening, Scanlon, & Hodes, 2001; Fletcher, Gordon, Asunda, & Zirkle, 2015; Lynch, 1990). Lynch's (1990) study identified twenty-seven (27) CTE teacher preparation programs in Florida. Fletcher et al (2015) identified seven available programs. In 2017, four CTE teacher preparation programs remained (Martino, 2017). As of Fall 2018, one CTE teacher preparation Bachelor degree program is no longer offered, leaving three active CTE teacher preparation Bachelor degree programs in Florida's state universities. Various questions arise from the incongruous supply and demand of Florida's CTE teachers. Are the current CTE teachers knowledgeable in pedagogy and best practices? Who will train the new CTE teachers? What are the reasons for the decline in available CTE teacher preparation programs? How do we keep the current programs active?

To better understand this phenomenon, this article discusses Martino's (2017) qualitative, Grounded Theory dissertation study that explored experiences and perceived program conditions

for sustainability. Participants included past and present CTE teacher preparation program educators and administrators in Florida. Data collection included semi-structured interviews, peer debriefing, memo-taking, and journal notes. The study was guided by the following research questions (a) How do past and present undergraduate CTE teacher preparation educators and administrators describe their program experience and program sustainability?; and (b) What perceived conditions do past and present undergraduate CTE teacher preparation educators and administrators believe are essential for program sustainability? (Martino, 2017). Analysis was conducted using a constant comparison approach until saturation occurred. The CTE Teacher Preparation Program Sustainability Framework was developed as a result of the findings. Based on the results of the study, some implications for best practice are presented.

Literature Review

To provide a better understanding of the declining Florida CTE teacher preparation program issue, review of the existing literature on CTE teacher certification, degreed CTE coverages, CTE teacher preparation program research, and studies on sustainability frameworks are presented.

Professional Educator's Certificate

The Florida Department of Education (FLDOE) oversees the approval for degreed teaching certificates in all 67 public school districts. A CTE teacher applicant must apply through the FLDOE website. The application requirements include a fee, official college transcripts, and other documentation as indicated. The official college transcript must show a completed Bachelor's degree from an accredited college or university as well as subject matter courses and four mandatory professional education courses: (a) teaching methods; (b) course construction; (c) lesson planning and evaluation; (d) teaching special needs students (Florida Department of Education, 2017). Once the CTE teacher applicant is approved, a temporary three-year license is provided with instructions on further requirements to obtain the professional teaching certificate to include a passing grade for three Florida Teacher Certification Examinations (FTCE): (a) General Knowledge; (b) Professional Education; (c) a specific subject area test (Pearson Education, Inc., 2017).

Degreed Career and Technical Coverages

To be eligible to become a CTE teacher, applicants must have 30 semester hours of college level courses in a subject area that align with one of the five degreed career and technical coverages for the CTE teacher professional certificate: (a) Agriculture; (b) Business Education; (c) Engineering & Technology Education; (d) Family & Consumer Science; and (d) Marketing. These degreed coverages are divided into subtopics. It is possible to have an agriculture degreed career and technical coverage professional teaching certificate and teach many subtopic courses within that coverage. Table 1 shows the five degreed coverages and each of the subtopics within the covered areas.

Table 1
Florida's Degreed Career and Technical Coverages and Subtopic Areas

No.	Agriculture	Business Education	Engineering & Technology Education	Family & Consumer Sciences	Marketing
1	Soil Science	Accounting	Materials & Manufacturing Processes Technology	Clothing Construction	Marketing Theory & Practices
2	Agricultural Mechanics	Economics or Finance	Drafting & Design Technology	Textiles	Economics
3	Food & Resource Economics	Computer Science	Energy & Power Technology	Food Preparation	Finance
4	Animal Science	Business Communication	Graphics Communication Technology	Nutrition	Accounting
5	Agronomy	Business law	Electronics Technology	Child Development	Personal Management
6	Horticulture		Construction Technology	Family Relations	
7	Entomology		Transportation Technology	Housing & Home Furnishings	
8	Forestry & Natural Resources		Biomedical Technology	Home Management	
9			Information Technology	Family Economics	
10			Industrial Systems Technology	Consumer Education	

Note. This information is derived from the Florida Department of Education Teacher Certification website (2017): <http://www.fldoe.org/teaching/certification/certificate-subjects/>. Table 3 (Martino, 2017).

CTE Teacher Preparation Program Research

To date, nine national and local studies regarding CTE teacher preparation program status and standing have been identified (Asunda, 2011; Bruening, Scanlon, & Hodes, 2001; Clark, 2004; Fletcher, Gordon, Asunda, & Zirkle, 2015; Litowitz, 2013; Lynch, 1990; Martino, 2017; Pucel & Flister, 1997; and Volk, 1993). These studies explored CTE teacher preparation program

curriculum, student enrollment, and organizational structure. It is noted that all the studies report a decline in program availability. Some findings indicated low enrollment and alternative certification as reasons for the decline in program offerings.

Sustainability Program Frameworks

Given the consistent decline in available CTE teacher preparation programs, research into the sustainability of the remaining programs is warranted. There are three studies in program sustainability that guided the objectives of this study: (a) Mancini and Marek, 2004; (b) Scheirer, 2005; and (d) Szuminski, 2003. These sustainability studies do not focus on CTE teacher preparation programs; however, recommendations to apply the sustainability framework to other disciplines are stated.

After careful review of the sustainability studies, there appeared to be a similarity in the frameworks. First, all three studies reported internal and external domains for sustainability. The internal domain includes categories that can be controlled by the program stakeholders. External domain categories are controlled by outside stakeholders. The categories from each of the sustainability studies also align in meaning. For clarity and conciseness, new categories were intuitively developed to define and further align the meanings. Table 2 shows the alignment between the new internal and external categories used in this study, the preliminary conceptual sustainability domains, and the three sustainability studies. The preliminary conceptual sustainability domains and categories form the conceptual framework for this study.

Table 2
Comparison of Sustainability Domains

	Existing Sustainability Framework Studies		
	Mancini & Marek's (2004) Elements of Sustainability	Scheirer's (2005) Program Sustainability Factor List	Szuminski's (2003) Components for Development Model
Preliminary Conceptual Sustainability Domains			
Internal Support			
Administrative Advocate	Leadership Competence	A "champion" is present	Administrative commitment
Organizational Alignment	Effective Collaboration/Strategic Funding	A program "fits" with its organization's mission and procedures	Job-embedded teacher development activities
Positive Culture	Staff Involvement and Integration	Benefits to staff members and/or clients are readily perceived	Continuous support with both emotional and instructional structures
External Support			
Extrinsic Influences	Understanding the Community	Stakeholders in other organizations provide support	Partnerships to leverage resources
Program Flexibility	Demonstrating Program Results/Program Responsivity	A program can be modified over time	Flexibility in design and implementation

Note. Mancini & Marek's (2004) study has seven domains. Two domains (strategic funding and program responsivity) fit in the organizational alignment and program flexibility domains respectively. Table 5 (Martino, 2017).

Research Procedures

The purpose of this study sought to discover the experiences and perceived conditions essential for program sustainability from past and present CTE teacher preparation program faculty and administrators. Two research questions guided this study: (a) How do past and present undergraduate CTE teacher preparation educators and administrators describe their program experience and program sustainability?; and (b) What perceived conditions do past and present undergraduate CTE teacher preparation educators and administrators believe are essential for program sustainability? (Martino, 2017).

Research Design

A qualitative Grounded Theory design with a constant comparative approach was used. This led to the discovery of patterns in the data using a repetitive process until saturation occurred. It is a recommended choice when the participant sample is small (Braun & Clarke, 2012; Charmaz, 2006; Glaser & Strauss, 1967; Mertens, 2015). The approach allowed for the exploration of past and present CTE teacher preparation educators' and administrators' experiences at a much deeper level. The data was analyzed multiple times while comparing the participants' meaning until themes were apparent.

Participants and Settings

Due to the limited number of available CTE teacher preparation programs in Florida, a purposeful sampling method was used to identify past and present CTE teacher preparation educators and administrators. This sampling method is frequently used in Grounded Theory qualitative studies (Gail, Gall, & Borg, 2007; Mertens, 2015). The method identified five universities: (a) Bethune-Cookman University; (b) Florida Agricultural and Mechanical University; (c) University of Central Florida; (d) University of Florida; and (e) University of West Florida.

Using each university's CTE teacher preparation program department website, potential participants' contact information was collected. Criteria for the selection process included: (a) all participants are employed, or recently retired, in one of the five Florida universities within an active or recently phased-out CTE teacher preparation program; and (b) all participants have or had direct involvement and knowledge of the active or recently phased-out CTE teacher preparation programs' daily operations and/or curricula from one of the five Florida universities.

Twenty-three potential participants were initially identified. One participant shared the study details with a qualified colleague. The participant's colleague asked to be included in the participant recruitment email. Of the twenty-four individuals recruited for this qualitative study, ten participants from four of the five universities responded (n=10), which yielded a 42% participation rate. Nine of the ten participants varied in job duties, CTE experience, and educational degree attainment. One participant recently retired. There were two females and eight males. All participants were given fictitious names to protect their identities. Table 3 lists the participants with a fictitious name, job title, degree attainment, and length of CTE work experience in years.

Table 3
Participant Selection Demographic Data with Fictitious Names

Fictitious Name	Job Title	Degree Attainment	Length of CTE Work Experience in Years
D. Parker	Dean of College	Doctorate	3
D. Miller	Associate Professor	Doctorate	8
D. Harris	Professor	Doctorate	13
D. Martin	Adjunct Instructor	Doctorate	11
D. Clark	Retired Professor	Doctorate	43
D. Lewis	Program Coordinator	Doctorate	14
D. Young	Adjunct Instructor	Doctorate	8
M. King	Adjunct Instructor	Masters	1.5
D. Smith	Program Chair	Doctorate	16
D. Jones	Program Coordinator	Doctorate	7

Note. The participants' first initial is designated with an 'M' which represents a master's degree, or a 'D' which represents a doctorate degree. Table 7 (Martino, 2017).

Measurement Instrument

The participant interviews were guided by semi-structured open-ended questions, which were modified from Mancini and Marek's (2004) quantitative Program Sustainability Index (PSI) instrument. The PSI instrument aligned well with previous literature on program sustainability as well as the Preliminary Sustainability Domains that guided this study. To verify the modified open-ended questions, three higher education teacher education programs educators reviewed the protocol. Suggestions were provided to clarify some of the questions, and revisions were made accordingly. To accompany the protocol, an interview guide was created with probing follow-up questions (Charmaz, 2006).

Data Collection

To ensure the research questions were answered, four data collection types were identified for qualitative research: contextual, perceptual, theoretical, and demographic (Bloomberg and Volpe, 2016). The contextual type contains the participants' culture, setting, and environment. The perceptual type is the perceived interview statements and comments, researcher's journal notes, and advisor's comments on emerging themes. The theoretical type involves the pertinent research studies and review of the literature. Finally, the demographic type includes the participants' job titles, educational attainment, and years of CTE experience.

The four methods used in the data collection process included: interview transcripts, researcher memo-taking, participant member checking, and a peer debriefing. The interviews were conducted either face-to-face or virtually using Skype for Business and were recorded. Then, the recordings were transcribed word-for-word. Journal notes were added to the data as well as notes received by member checking and peer debriefing. All the data was compiled and organized into tables for side-by-side comparison and analysis.

Data Analyses

A two-step (initial and focused) coding strategy was used (Charmaz, 2006). In the first initial stage, the collected data were organized into a series of tables and assigned labels to determine patterns in the information gathered (Bowen, 2005; Gail, Gall, & Borg, 2007; Mertens, 2015). For the initial coding phase, statements of interest were highlighted while transcribing the interviews into a Word document. Once the individual transcriptions were completed, the transcripts (without the researcher's notes) were sent to the respective participants for member checking. Review of the literature, researcher's notes, and archival information was conducted, and notes were added to the tables. The documents were reread, line-by-line, and additional words and phrases were highlighted with comments written in the margin. The data was reviewed a third time, and final notes were added.

The focused coding phase was conducted for each research question. All transcriptions were merged into a Word document along with notes and comments. All participant identifiers were removed. The data was reduced and organized three times into sets of consecutive tables. This process led to the development of themes that emerged from the data. Simultaneously, the Microsoft Office Word 'Find' function was used to identify the number of times these words or phrases were used. This is a recommended strategy called *in vivo* that adheres to credibility standards in qualitative research (Charmaz, 2006; Mertens, 2015). The words and phrases were compared for similar meanings and added to a new table. Lastly, a constant comparisons analysis

was completed using participant-to-participant tables, review of the literature, and other collected data to align meaning and answer each research question.

Results

The purpose of this study was to: (a) explore reasons for CTE teacher preparation program sustainability; and (b) to identify ways to sustain these programs through the perceptions of past and present CTE teacher preparation program educators and administrators. Data analysis resulted in emerging thematic categories based on the participants' perceptions and experiences. Meanings were theoretically constructed from the data with constant comparison between the participants, the researcher's notes, and the literature (Charmaz, 2006). Each word instance was constantly compared to ensure the meaning of the phrases were similar, saturation of the data occurred, and themes emerged from the data. The themes' meanings best represented similar words and phrases that were either vague or misleading.

The key findings were organized by research question. Each research question was answered by either an internal or external domain. Research Question 1 was answered by four categories that work together as a continuous and equal pattern for sustainability. These are areas that the participants felt were controlled by them, or internally controlled. Research Question 2 was answered by three categories participants felt were outside of their control but were important for program sustainability, or externally controlled.

Research Question 1 (internal domain). The first research question addressed perceived program experience. The internal domain categories revealed rationalized strategies the faculty and administrators put into place to help sustain the program. The four categories in the internal domain for research question 1 include: (a) statewide exposure; (b) intracampus alliance; (c) innovative changes; and (d) program ownership.

Statewide exposure. Statewide was mentioned only six times, but the word "community" was mentioned 110 times. Most often, "community" meant CTE teacher preparation program stakeholders throughout the state. Stakeholders included school districts, associations, state colleges, technical centers, advisory boards, external committees, conferences, or industry student competitions. Since the word "statewide" represented the location of the many different stakeholders, it was felt to be a better representation of the meaning than the word "community", which can have many meanings. The word "exposure" was only mentioned twice. However, this word best represented the participants meaning for recruitment. Whenever the participants went out into the community, they were recruiting for their program. "Everyone always has their recruitment hat on" (D. Harris, personal communication, January 27, 2017). Therefore, *statewide exposure* best represented how to sustain a program through statewide promotional efforts.

Intracampus alliance. This phrase was developed from a question in the interview protocol: Who within your institution's administration is an advocate for your program and how does that person support you? The word "support" was mentioned 124 times in the data, which had many meanings. Szuminski's (2003) Components for Development Model also includes "Continuous emotional/psychological and instructional support" (Szuminski, 2003, p. 1). The meaning indicated the ability to show value to administration or other college/department personnel in return for support or acceptance. "You go across campus. You have to be able to work across"

(D. Lewis, personal communication, February 1, 2017). Therefore, the term “intracampus” allows for a clearer description of where the support occurs. The second word “alliance” explains the type of relationships with other departments, other colleges, and administrators within the university. Therefore, *intracampus alliance* was a phrase derived from the participants’ meaning.

Innovative changes. The word ‘innovative’ was mentioned only five times. However, ‘innovative’ represented the clever strategies most of the participants used to keep their CTE teacher preparation programs active. One participant explained how they restructured the program when the enrollment numbers were low, “We offer classes every other year to get our numbers back up to that 18 to 20” (D. Smith, personal communication, January 27, 2017). The ability to anticipate issues and develop ways to reform, revamp, or revise the program in innovative ways is a strategy for sustainability. Thinking about solutions for challenges and issues in ways that do not burden the program is a way to sustainability.

Program ownership. Ownership was used a few times by one participant. “You have to have passion for what you are doing. Ownership... ownership of the program” (D. Lewis, personal communication, February 1, 2017). However, it is a word that best explains many of the other more generic terms that appeared in the data such as value (listed 39 times), pride/proud (listed eight times), respect (listed 16 times), cares (listed 18 times), and succeed (listed nine times). Together, these words are listed 90 times, but represent ownership.

Internal domain conclusion. An internal domain framework of thematic categories is represented. The four categories work together as sustainability strategies for CTE teacher preparation program faculty and administrators as shown in Figure 1.

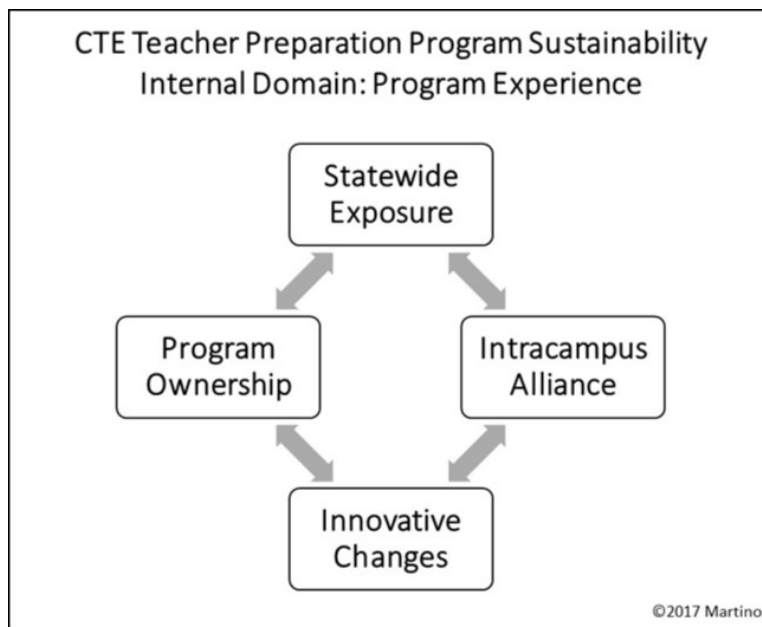


Figure 1

Research Question 2 (external domain). The second research question addressed conditions that were essential for sustainability. Because the essential conditions were perceived necessary for sustainability, the discussion began with challenges. The external domain categories revealed issues that program administrators and faculty may be able to improve through community outreach and education. Three main categories developed from the data are: (a) program value, (b) certification alignment, and (c) employment policies.

Program value. Participants mentioned it was necessary to have institutional administrators who value the program. It was noted that showing value is a great strategy for sustainability, but having the institutional administrators accept the program's value is another matter. Issues emerged to further define ways external stakeholders can affect program value: (a) misinformation; (b) different teacher certifications; and (c) underfunded, understaffed, and underappreciated.

Misinformation occurs when administrators do not understand the program or its needs. Participants stated there is misinformation regarding the value of CTE and the effects the CTE teacher preparation program have on the economy in educating the workforce. A participant retold a story of his administrator's observation in his class.

“By the way, when are you going to teach?” I realized he didn't know what teaching was, teaching lab. My answer to him was “What do you think I've been doing this whole period since you've been here?” He said, “No, I mean when are to going to lecture?” because to him that was teaching. (D. Clark, personal communication, February 1, 2017).

Two teacher certifications exist in Florida: initial teacher certification and alternative certification. The participants who work in an initial teacher certification program expressed frustration at the certification process and may be misinformed on alternative CTE education degree programs. “They have the content knowledge, but they don't have the pedagogical knowledge” (D. Miller, personal communication, February 2, 2017). The CTE teacher preparation initial certification program enrolls students who learn content and professional education knowledge. Upon graduation, they receive a Florida teaching certificate. The alternative CTE teacher preparation program enrolls students who have experience in the field and take additional content knowledge courses along with professional education courses. After graduation, potential CTE teachers may apply for a teaching license.

Another way participants expressed insufficient program value was through understaffed programs. CTE programs are statewide; therefore, there are heavy travel and recruitment responsibilities. “I know that one of the recommendations of the program evaluators was that we should have another full-time person...” (D. Young, personal communication, January 31, 2017). Additionally, a trend within misinformation is hiring non-CTE personnel for their programs. “I'm concerned that the program is going to suffer when she's gone. Unless we get someone in there who really knows the program, understands the history behind it, understands the students...” (D. Martin, personal communication, January 31, 2017).

Certification alignment. In Florida, there are only two active state-approved CTE initial teacher preparation programs. Some participants stated one of the reasons for low enrollment is the way the State regulates the teacher certification requirements. In state-approved initial certification programs, students are required to pay for and pass three state certification exams before they can take the corresponding courses. The exams include: (a) subject area test; (b) professional education; and (c) general knowledge. “He made it through all three except the professional. He missed it by two points. He just had to take it over again and then he passed” (D. Miller, personal communication, February 2, 2017). According to the Florida DOE website, the General Knowledge Test (GK) is \$130 and retake is \$150; the Professional Education Test is \$150, and the retake is \$170; subject area examinations are \$200 each and the retake fee is \$220 each (Florida Department of Education, 2017).

Employment policies. Effective CTE teachers are in high demand, but there are not enough CTE teacher preparation programs to train them. “We actually have CTE directors and principals that are starting to show up on campus here since January to meet with our students... snatched up as quick as they can” (D. Smith, personal communication, January 27, 2017). One issue for low enrollment may be due to CTE teacher salary, according to some participants. “You see a lot of kids just say it’s not worth it. I’ll go out into business and get a job” (D. Parker, personal communication, February 3, 2017).

External domain conclusion. An external domain thematic framework is represented in the three categories that work together as a continuous and equal pattern for sustainability. The external domain categories are not controlled by the program faculty and administrators as shown in Figure 2.

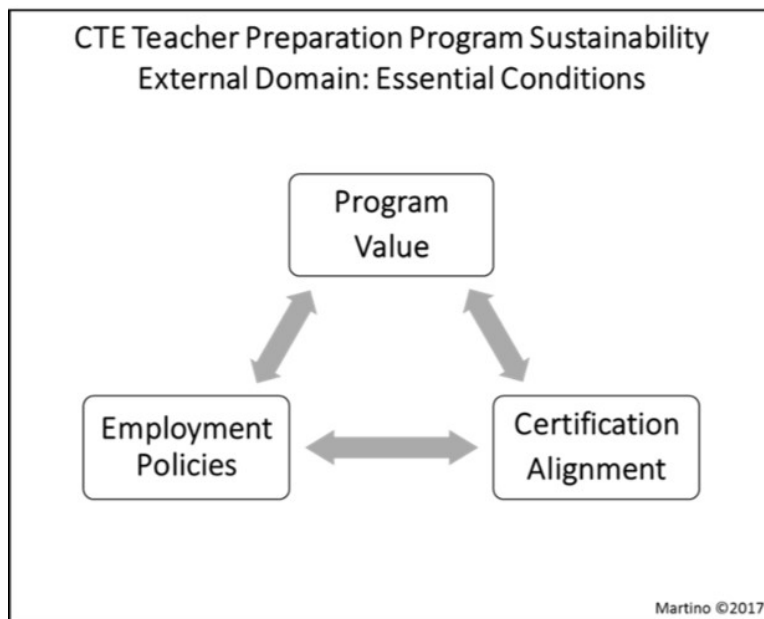


Figure 2

Summary of the Results

For program sustainability, strategies can be implemented by faculty and administrators. However, external stakeholder support is also necessary. The findings align with the previous studies on CTE teacher preparation programs as well as contribute to literature with a qualitative design. The qualitative design of this study brought about a better understanding of the CTE program participants’ experiences, the programs’ structures and organizations, and perceived essential conditions for sustainability in a narrative format.

The findings, as a holistic framework for sustainability, perceived by CTE teacher preparation experts include two separate but equal domains: internal and external. One domain is not more important than the other, and the categories within the domains are equally important. Figure 3 shows a graphic representation of the internal and external domains grounded in the research. This final framework graphic represents the equal balance of the internal and external domain categories that should be present for sustainable programs. The arrows balance the bar in the middle that represents the CTE teacher preparation program.

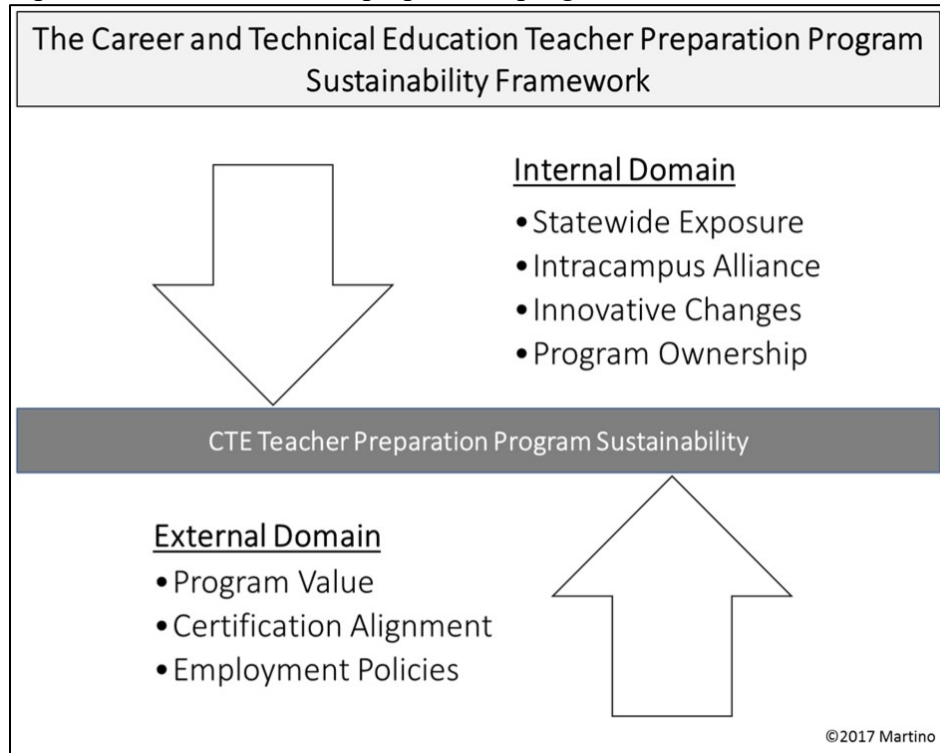


Figure 3

An interesting final finding revealed that CTE teacher preparation programs with higher student enrollments had both the internal and external domain categories in place. The lower enrollment CTE teacher preparation programs had some categories in place. Thus, for a successful CTE teacher preparation program, both domains and all the corresponding subthemes should be used as a guide for sustainability.

Limitations and Implications

Limitations in this study include a small purposeful participant sample and the geographic limitation of Florida state universities. However, the implications for this research are far-reaching. The framework may be used by CTE law makers and stakeholders to create practical policies to support CTE teachers. It can also act as a sustainability roadmap for programs facing possible closure. With that in mind, future research to further this study may include qualitative Grounded Theory studies of external CTE stakeholders, such as Deans, to explore their perceptions of CTE teacher preparation programs. Another qualitative research study involving CTE teaching certification policymakers and their understanding of CTE teacher preparation programs may be useful to assist in the alignment of teacher certification practices. Finally, replication of this study in other U.S. states would be useful to compare the results. In any case, more qualitative research is needed in CTE teacher preparation programs to bring about a deeper understanding and awareness in the issue of program sustainability.

Conclusions and Recommendations

Martino's (2017) study allowed for an investigation of the language, culture, and environment of the participants. The resultant framework has been theoretically grounded in the data. This led to a deeper understanding of the internal and external domains that may have contributed to the decreased CTE teacher preparation programs in Florida. Furthermore, this study aligned with previous program sustainability studies to support the hypothesis of the necessity of internal and external stakeholder support. Therefore, it should be noted that this framework and research design may be helpful to other disciplines for the purpose of a program sustainability study.

References

- Asunda, P. A. (2011). Career and technical education teacher preparation trends: A pilot study. *Online Journal for Workforce Education and Development, V(3)*. Retrieved from <http://opensiuc.lib.siu.edu/>
- Bethune-Cookman University. (2017). Retrieved from <https://www.cookman.edu>
- Bloomberg, L. D., & Volpe, M. (2016). *Completing your qualitative dissertation: A road map from beginning to end* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77-101.
- Bruening, T. H., Scanlon, D., & Hodes, C. (2001). *The status of career and technical education teacher preparation programs*. Columbus: National Dissemination Center for Career and Technical Education. Retrieved from <http://eric.ed.gov>
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: SAGE Publications Ltd.
- Clark, B. S. (2004). *Sustaining innovation in career and technical education*. (Doctoral dissertation, Western Michigan University). Retrieved from <http://scholarworks.wmich.edu/>
- Darling-Hammond, L. (2000, January 1). *Teacher quality and student achievement: A review of state policy evidence*. Retrieved from education policy analysis archives, 8(1): <http://epaa.asu.edu/ojs>

- Fletcher, J. E., Gordon, H. D., Asunda, P., & Zirkle, C. (2015). A 2015 status study of career and technical education programs in the United States. *Career and Technical Education Research, 40*(3), 191-211. doi:10.5328/cter40.3.191
- Florida Agricultural and Mechanical University. (2017). Retrieved from www.famu.edu
- Florida Department of Education. (2017). Retrieved from www.fldoe.org/
- Gail, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston: Pearson Education.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Litowitz, L. S. (2013). A curricular analysis of undergraduate technology & engineering teacher preparation programs in the United States. *Journal of Technology Education, 25*(2), 73-84. Retrieved from <http://scholar.lib.vt.edu/ejournals/JTE>
- Lynch, R. L. (1990). A national database on vocational teacher education. Berkeley, CA: *National Center for Research in Vocational Education*. Retrieved from <http://files.eric.ed.gov>
- Mancini, J. A., & Marek, L. I. (2004). Sustaining community-based programs for families: Conceptualization and measurement. *Family Relations, 53*(4), 339-347.
- Martino, L. M. (2017). *The sustainability of career and technical teacher preparation programs in Florida* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (No. 10266120).
- Mertens, D. M. (2015). *Research and evaluation in education and psychology* (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Pearson Education, Inc. (2017). Florida Teacher Certification Examinations. Retrieved from <http://www.fl.nesinc.com>
- Pucel, D. J., & Flister, S. (1997). The current status and future of industrial teacher education and non-teacher education programs in institutions of higher education. *Journal of Industrial Teacher Education, 34*, 64-79.
- Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation, 26*(3), 320-347. doi:10.1177/1098214005278752
- Szuminski, K. (2003). *Teacher development in CTE*. National Dissemination Center for Career and Technical Education. Washington, D.C.: Office of Vocational and Adult Education.
- University of Central Florida. (2017). Retrieved from <http://ucf.edu>
- University of Florida. (2017). Retrieved from <http://www.ufl.edu>
- University of West Florida. (2017). Retrieved from <http://uwf.edu>
- Volk, K. S. (1993). Enrollment trends in industrial arts/technology teacher education from 1970-1990. *Journal of Technology Education, 4*(2). Retrieved from <http://scholar.lib.vt.edu/>