Doctor of Education Dissertations   College of Education

Fall 2022

An Examination of Student Perceptions of Career and Technical Education Teachers' Interpersonal Behaviors and Their Impact on Student Achievement

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AN EXAMINATION OF STUDENT PERCEPTIONS OF CAREER AND
TECHNICAL EDUCATION TEACHERS' INTERPERSONAL BEHAVIORS AND
THEIR IMPACT ON STUDENT ACHIEVEMENT

By
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A Dissertation Submitted to the
Gardner-Webb University College of Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

Gardner-Webb University
2022

Approval Page

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Acknowledgements

My first acknowledgement is to God who is my Shepherd, strength, and redeemer. To my great-grandparents, grandparents, and especially my parents, Olin, Jr. and Geneva Gallman, who instilled perseverance and hard work in me and always supported me in all of my endeavors. To my children, Christa, Christian Joshua, Jessica, and goddaughter, Vanessa, for understanding all the times I had to work on my dissertation. To you, Joshua, my son, for proofreading my work when you had an enormous workload of your own. To my brothers, Dennis and Tony, who are always willing to help me. To my special friend and cousin, Carolyn, thank you for all your love and support; you are always there for me. To Gardner-Webb University for providing me with this opportunity. To my dissertation committee: Dr. Sydney Brown, Chair, Dr. Michelle Bennett, and Dr. Larry Williams, for your support. To Dr. Mitch Porter and Dr. Jennifer Putman, for assistance. To my cohort, family, and friends who encouraged me throughout this journey. Finally, to all the children whose lives I have touched and will continue to touch in the future.

Abstract

AN EXAMINATION OF STUDENT PERCEPTIONS OF CAREER AND

TECHNICAL EDUCATION TEACHERS' INTERPERSONAL BEHAVIORS AND

THEIR IMPACT ON STUDENT ACHIEVEMENT. Gallman, Gail Delores, 2022:

Dissertation, Gardner-Webb University.

The purpose of this quantitative study was to examine career and technical education

(CTE) students' perceptions of CTE teacher interpersonal behaviors and their impact on

student achievement. This study is important because teacher-student relationships

impact student achievement and CTE struggles with students earning concentrators and/

or completers. Wubbels et al.'s (1985) 48-item student questionnaire of teacher

interaction was administered to CTE students enrolled in CTE courses. Descriptive

statistics revealed students perceive their teachers as having more leadership,

understanding, and helping/friendly behaviors and less uncertain, student

responsibility/freedom, admonishing, dissatisfied, and strict behaviors. Due to the small

sample size, the nonparametric Spearman's rank correlations and Whitney-Mann U-test

were not conducted to determine the relationship between students' grades and their

perceptions of teachers' interpersonal behaviors in the classroom. The implications of

these findings suggest additional research in CTE as it relates to CTE teachers' teaching

behaviors of females, African American males, and secondary biology and management

teachers.

Keywords: career and technical education, interpersonal communication theory,

systems communication theory, model of teacher interpersonal behavior, student

perceptions, teacher interpersonal behavior, QTI, Student Questionnaire of Teacher

Interaction

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Chapter 1: Introduction

Throughout my years as a career and technical education (CTE) teacher, I frequently had the experience of a student moving into my classroom without a clear explanation. In most cases, I was told, "They may work better with you" or "They need a different teacher." This response neither satisfied my curiosity nor was helpful. Immediately, I assumed the student experienced academic difficulty or conflict existed within the previous classroom. Regardless, it was my responsibility to embrace, motivate, engage, and instruct the student upon arrival. Over the years, I have learned when interactions between teacher and student are problematic, an adverse effect on student achievement may occur.

According to Wilkins (2014), students' increased motivation, improved academic achievement, decreased absenteeism, and improved attitudes toward school were associated with good relationships between teachers and students. The essence of education is to develop positive relationships between knowledgeable, caring adults and students. One role of a teacher is to get to know their students as individuals and help build positive relationships with them. To do this, it is imperative that teachers embrace each student's unique needs, social and cultural backgrounds, learning styles, and abilities. According to Mesa-Bains (2018), the United States is more diverse than ever. And so, more than ever, teachers must be committed to embracing and relating to all students in their classrooms. Teachers engage in instructional planning; however, it is also recommended they engage in relational planning to improve learning in the classroom (Potvin, 2019).

Teaching is a multifaceted position that requires teachers to help students grow

socially, emotionally, and intellectually. The types of interactions teachers have with students directly impact students' social, emotional, and academic experiences (Wilkins 2014). As a matter of fact, teachers develop different types of relationships with their students. How teachers and students interact in the learning environment may depend on the teacher's interpersonal behaviors. According to Leary (1957), interpersonal behavior is seen as behavior that directly affects another human being. Specifically, interpersonal behaviors include friendliness, understanding, uncertainty, and admonishing. These behaviors have been proven to significantly impact students' success in the classroom (Madike, 2015; Wubbels et al., 1985, Wubbels & Levy, 1989).

Student views of teacher interpersonal behaviors and the meaning of those behaviors are determined by students' perceptions. Teacher behaviors can influence student behaviors and student behaviors can influence teacher behaviors (Wubbels et al., 1991). Research findings have been consistent regarding teacher behaviors desired by students (Wilkins, 2014). Students prefer teachers who show leadership, are helpful/ friendly, and demonstrate understanding behaviors (Madike, 2015; Wubbels & Levy, 1989). Many aspects are necessary to build a quality teacher-student relationship (Longobardi et al., 2016). Those who work within the school are instrumental in fostering an environment that is positive for all students (Reich, 2014).

Students may provide insight into teacher interpersonal behaviors that may not be apparent to external observers. Those interpersonal behaviors most significant to the student may lead to creating more effective schools. Building close ties with students depends on the teacher's characteristics (Fredriksen & Rhodes, n.d.). Teachers who develop an awareness and examine their role and the impact of their interpersonal

behaviors in the learning environment may benefit student learning.

Teacher personalities and attitudes differ depending on many factors. Some teachers are understanding; others are not. Some are lenient; some are strict. Some are businesslike; others are relaxed. Some are friendly; others are standoffish. According to Wubbels et al. (1997), it is crucial for teachers to create and maintain positive interpersonal skills in the classroom. This finding is based on 15 years of research with more than 50,000 students and teachers in the Netherlands, the United States, and Australia (Wubbels & Brekelmans, 2005). Exceptional teaching is not only measured by instructional methodology but is also based on teacher interactions and relationships with students (Goe et al., 2008).

Statement of the Problem

CTE offers students many opportunities in high school. Students can earn industry certification, dual credit, or concentrator (at least two courses in a state CTE program) or completer (three or four courses in a state CTE program) credentials. These credentials can support postsecondary education or career opportunities. However, many students enrolled in CTE classes fail to earn a concentrator or completer in one of the 10 CTE fields: agriculture and renewable resources, business, marketing, health care, protective and public services, technology and communications, trade and industry, food service and hospitality, childcare and education, and personal and other services. In the United States, CTE has played an important role in secondary education (Perkins Collaborative Resource Network, n.d.-a). Data Point presents information on various education topics of current interest and provides the most recent data on CTE (U.S. Department of Education, 2019a). According to U.S. Department of Education (2019b), 77% of ninth-

grade public school students participated in CTE by the end of their senior year in 2013. These students earned at least one credit in a CTE course; however, 37% of those students went on to complete concentrators in a specific area of CTE (U.S. Department of Education, 2019b). Furthermore, federal funding is tied to the number of students who complete concentrators, completers, and those who earn recognized industry certifications. In 1984, the government first authorized the Carl D. Perkins Vocational and Technical Act. This act aimed to improve the quality of CTE within the U.S. in order to help the economy.

The Strengthening Career and Technical Education for the 21st Century Act (2018), known as Perkins V, requires states to report annually on five indicators:

- the percentage of CTE concentrators who graduate from high school with a diploma and an extended diploma, as measured by the 4-year adjusted cohort graduation rate

- the percentage of CTE concentrators proficient in reading, math, and science

- the percentage of CTE concentrators exiting from secondary education in postsecondary education or advanced training, military service, or a service program after the second quarter of exiting high school

- the percentage of CTE concentrators in CTE programs and programs of study that lead to nontraditional fields (i.e., girls enrolled in auto technology, males enrolled in health science)

- the percentage of CTE concentrators attaining a recognized postsecondary credential before exiting high school

If schools do not meet the expectations of Perkins V, federal and state funding for CTE

programs is jeopardized.

CTE is meant to connect students to postsecondary education and additional training. It creates a pathway for students to gain skills while in high school. The U.S. Department of Education (2019b) stated, "At the high school level, CTE provides students with opportunities to explore a career theme of interest while learning a set of technical and employability skills that integrate into or complement their academic studies" (para. 1). Regardless of a student's ultimate career path, CTE programs offer students the opportunity to personalize their learning experience. According to Bloomfield et al. (2013), because CTE programs are competency-based and personalized, they create an opportunity to build a closer relationship between teacher and student than in a regular classroom setting. The teacher's ability to build relationships, therefore, is critical.

The reason why this research, then, focused on CTE teacher interpersonal behaviors is because all the components in the classroom are the teacher's responsibility. Positive teacher-student relationships that create a classroom environment in which students are motivated to learn are critical (Koca, 2016). For teachers to improve or switch to certain types of behaviors, they need to fully understand how students perceive them in the classroom. As noted earlier, 77% of ninth-grade students participated in CTE, but only 37% of those students earned a concentrator (U.S. Department of Education (2019b). This research may provide a better understanding of teacher interpersonal behaviors students perceive as most significant to their achievement. While teachers cannot control student behavior, they can control their own behaviors, and that may lead to improved student achievement. Finally, improving teacher interpersonal behaviors

may contribute to a higher rate of student retention for CTE programs, resulting in an increase in federal and state funding.

Purpose of the Study

The purpose of this study was to examine CTE student perceptions of teacher interpersonal behaviors and the effect of those behaviors on student achievement in their CTE course. This study attempted to be a replication by extension of Madike's (2015) study, although low participation impacted the extent of replication possible. The results of this study are partially compared with Madike's study in Chapter 5. I hoped to determine whether the findings from Madike's study were generalizable for a different population, setting, and context. Similarities and differences exist between the studies. My study was similar to Madike's study in the following ways:

- Both studies used the interpersonal communication and systems communication theory as the theoretical framework.

- The quantitative research survey approach and the Student Questionnaire of Teacher Interaction (QTI) were used.

- The single-stage purposive sampling method was used to select participants.

On the other hand, differences existed in the following ways:

- The Model of Interpersonal Teacher Behavior (MITB) was included as part of the theoretical framework in my study.

- The research questions were revised to represent the population in the study.

- A different population, setting, and sample size was used.

- The data collection and data analysis were different.

Further discussion of similarities and differences is presented in Chapter 3.

Madike's (2015) study was designed "to examine whether relationships exist between cognitive outcomes and the quality of teacher-student interactions among students taking introductory biology courses in a suburban community college" (p. 12). Three research questions were formulated to investigate the relationship between teacher-student interactions and student achievement:

1. How do students perceive the interpersonal behaviors of the instructors of their introductory biology courses?

2. What is the relationship between students' perceptions of teacher interpersonal teaching behavior and student achievement in introductory biology courses?

3. Do student perceptions of teacher interpersonal behavior differ based upon students' achievement levels in introductory biology courses?

According to Madike (2015), biology teachers were perceived as having stronger interpersonal skills in leadership, understanding, and helpful/friendly behaviors as grades increased. Teacher interpersonal behaviors in introductory biology courses were found to be positively related to student achievement (Madike, 2015). Students with higher grades (As and Bs) rated their teachers significantly higher in leadership, understanding, and helping/friendly than students with lower grades (Cs, Ds, or Fs; Madike, 2015).

For this study, the research questions were modified so generalizations could be attempted across a different population, setting, and context. The population in this study was ninth- through 12th-grade students who attended the Center in a southeastern state. Studies have been conducted investigating how teacher behavior affects student achievement in specific subject areas but has been limited in CTE. The goal of this

research was to examine whether relationships existed between teacher-student

interactions and student achievement for students enrolled in CTE courses. An awareness

of the role of teacher interpersonal behaviors in CTE classrooms and how those behaviors

impact student achievement may help to improve students' academic outcomes. The

revised research questions were as follows:

Research Questions

1. How do students perceive the interpersonal behaviors of their CTE teacher?

2. What is the relationship between student perceptions of teacher interpersonal

   teaching behaviors and student achievement in their CTE course?

3. Do student perceptions of teacher's interpersonal behaviors differ based upon

   student achievement levels in the CTE course?

Theoretical Framework

This study utilized interpersonal communication theory, systems communication

theory, and the MITB (Leary, 1957; Watzlawick et al., 1967; Wubbels et al., 1985).

Leary's (1957) interpersonal communication theory is concerned with the impact of one

individual on the other. Watzlawick et al.'s (1967) systems communication theory

examines the interconnectedness of human communication. Interpersonal communication

and systems communication theories have been used in psychological and clinical

settings but were adapted for use in educational settings by Dutch researchers

(Charalampous & Kokkinos, 2017; Horowitz & Strack, 2011; Wubbels et al., 1985,

1991). The MITB was developed by Wubbels et al. (1985) to map teachers' interpersonal

behaviors. This model provides a representation of how teaching involves the teacher and

student relationship and how the interaction is perceived from one person to another

(Wubbels et al., 1985).

Interpersonal Communication Theory

Interpersonal communication is defined as the overt communication events from one person and the social impact one has on another (Leary, 1957). What a person does in any social situation is based on the activities and effects of the other person with whom they are interacting (Leary, 1957). The focus of interpersonal communication is the way in which a person receives messages and responds to them in the context of a relationship (Leary, 1957). It pertains to the content and the quality of the messages relayed and the possibility of further relationship development. Interpersonal communication is concerned with how one person communicates with another. Student academic and affective outcomes have been linked to teachers' interpersonal teaching behaviors (Charalampous & Kokkinos, 2017).

Leary (1957) developed a system that is the foundation for assessing interpersonal constructs. His research led to the development of Leary's Interpersonal Behavior Model (Leary, 1957). This model has been adapted for educational use (Wubbels et al., 1985, 1991). The original model can be viewed in a two-dimensional circle where points located vertically (i.e., dominance-submission) represent the influence dimension and points located horizontally (i.e., hostility-affiliation) represent the proximity dimension. Eight sectors are systemically arrayed around the orthogonal axes (i.e., leadership, helping/friendly, understanding, student responsibility/freedom, uncertain, dissatisfaction, admonishing, and strict; Leary, 1957; Paddock & Nowicki, 1986). Figure 1 presents a schematic depiction of the MITB with its axes, poles, and sectors.

Figure 1

Schematic Depiction of the Model of Interpersonal Teacher Behavior

Note. From "Interpersonal Teacher Behaviour and Student Outcomes, School Effectiveness and School Improvement," P. den Brok, M. Brekelmans and T. Wubbels, 2004, *International Journal of Research, Policy and Practice*, *15,* p. 413, Copyright 2004 held by Routledge Taylor & Francis Group. Reprinted with permission.

An adaption of Leary's (1957) model was later created by a team of researchers in the Netherlands to map interpersonal teacher behaviors (Wubbels et al., 1985, 1993).

MITB

Wubbels et al. (1985) developed the MITB to map teachers' behaviors with a proximity dimension (i.e., Cooperation, C – Opposition, O) and influence dimension (Dominance, D – Submission, S) combined with the eight sectors from Leary's (1957) model. The interpersonal communication theory has been successfully applied to the educational context through the development of the MITB (Horowitz & Strack, 2011; Wubbels et al., 1985, 1993, 2012). Figure 2 depicts the MITB developed by Wubbels et

al. (1985). It illustrates the typical teaching behaviors in the classroom setting.

Figure 2

Model of Interpersonal Teacher Behavior
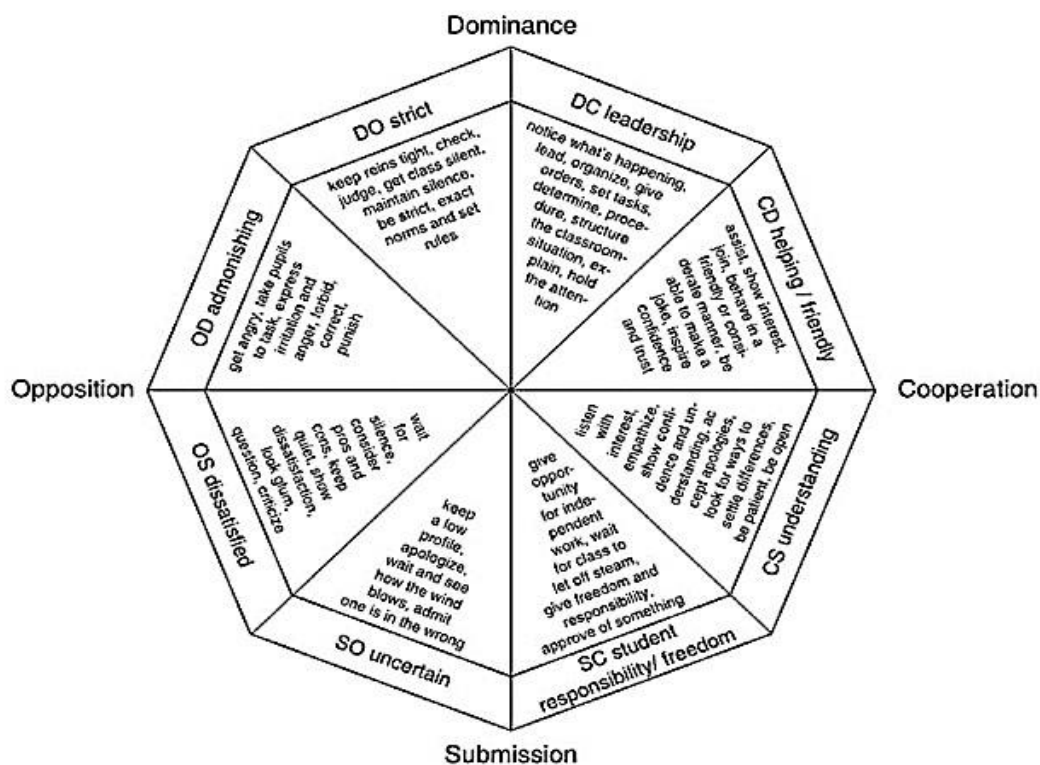
Note. From "Do you know what you look like? Interpersonal relationship in education,"

T. Wubbels, H. Creton, J. Levy, and H. Hooymayers, in T. Wubbels and J. Levy (Eds.),

The Model of Interpersonal Behavior (p. 14) 1993, London, England, The Falmer Press.

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The MITB has been used in various studies to determine student perceptions of

teacher interpersonal behaviors in the classroom and its impact on achievement (Madike

2015; Wubbels et al., 1985). Clearly, human communication is crucial in understanding

teacher and student interactions.

Systems Communication Theory

The systems communication approach conceives the classroom group as an ongoing system. For ongoing systems, a certain stability is important for continued existence. A system is created in perceiving and communicating relationship roles (UK Essays, 2018). Dainton (2004) described the theory as the central part of all systems approaches, which means all system members are dependent upon each other. It focuses on the communication among a group of people interacting. According to Watzlawick et al. (1967), we communicate culturally and contextually.

Both communication theories, interpersonal communication and systems communication, influence the study because they involve human communication. Communication is defined as the process of individuals sharing their views (Khan et al., 2017). According to Asrar et al. (2018), if both parties have communication skills, it is easier to establish a good relationship between the teacher and students. All relationships go through a communication process that involves meeting one another, exchanging information, and adjusting and developing expectations similar to what any two individuals would go through in developing a relationship (Frymier & Houser, 2000). If all relationships go through a communication process, this process must also be present in the classroom. The relationship that develops between teachers and students influences learning both directly and indirectly (Frymier & Houser, 2000); therefore, these communication theories are crucial in understanding how students perceive the teacher's interpersonal behaviors.

Wubbels et al. (1985) believed all teacher interactions can be plotted on the MITB. The eight sectors previously identified are associated with teaching behaviors.

How students perceive these teaching behaviors and the impact on achievement are clearly visible on the MITB. The graphic representation (Figure 2) of the MITB shows the quadrants, which are subdivided into equal-sized octants. The MITB formed the basis of the development of the QTI, which is used to measure student perceptions regarding the interaction with their teacher. The items on the QTI are aligned with the sectors on the MITB.

Definition of Terms

In this study, the following definitions of terms are used.

CTE Programs

Allow students to develop academic skills to prepare for secondary education and the real-world workforce. CTE programs provide students the opportunity to engage and prepare for careers in 10 broad CTE clusters: agriculture and renewable resources, business, marketing, health care, protective and public services, technology and communications, trade and industry, food service and hospitality, childcare and education, and personal and other services. Students can earn a concentrator or completer, dual credit, and/or recognized industry certifications in CTE programs if they complete the required courses within the program. Within each cluster, there are courses with an assigned Classification of Instructional Programs (CIP) code. These CIP codes are used for federal reporting, assessing federal Perkins accountability, and identifying specific CTE programs and indicators (South Carolina Department of Education, 2020c).

CTE Completer

When a student earns all the required units in a state-recognized CTE program (South Carolina Department of Education, 2020c).

CTE Concentrator

Earned when a secondary education student completes at least two courses in a state-recognized CTE program or program of study. CTE programs must be comprised of an approved sequence of CTE courses leading to a career goal and must include the minimum number of Carnegie units of credit required for the program (South Carolina Department of Education, 2020c).

Teacher and Student Interaction or Relationship

The terms interaction and relationship are used interchangeably as defined by the constructs in the QTI related to teacher behavior. Those constructs are leadership, understanding, uncertain, admonishing, helping/friendly, student responsibility/freedom, dissatisfied, and strict behaviors used when interacting with the students in the classroom (Wubbels et al., 1985, 1993).

Teacher Interpersonal Behavior

A teacher's ability to support and facilitate the growth of students through teacher interaction and behaviors.

Assumptions

Proposed beliefs in a study that we assume are true are assumptions; they are necessary to conduct the study but cannot be proven (Simon & Goes, 2013). The assumptions in this study included the notion that the participants enrolled in a CTE course have spent enough time in the classroom with the teacher to respond to the survey, and their responses would be an accurate reflection of their true perceptions. The privacy of all participants was assured and maintained, and participants were made aware that their participation was strictly voluntary.

In this study, another assumption was that the behaviors of the teacher influences that of the student (Passini et al., 2015). Previous research investigating teacher-student relationships using the QTI was mostly conducted at the elementary and high school levels, specifically in math, science, and English as Foreign Language classes (Telli et al., 2010; Wei et al., 2009; Wubbels & Brekelmans, 2005). In this study, students enrolled in CTE classes were the target population. The assumption was a diversified group of students would participate in the study (i.e., males, females, races, students of poverty, grade levels, and ability levels).

Limitations of the Study

Limitations are constraints that are largely beyond the researcher's control but could affect the outcome of the study (Simon & Goes, 2013). The research was limited to ninth through 12th graders enrolled in CTE classes. Convenience sampling was selected because it provided the opportunity to get the largest sample size. Students enrolled in a CTE course at the Center were selected to participate in the study if both parent consent and student assent forms were completed. However, it should be noted that convenience sampling restricts the use of generalizability to other populations. The achievement data utilized was the student's self-reported cumulative grade in the CTE course in which the student was enrolled. It did not include the student's overall grade point average (GPA). If a student was enrolled at the Center, they were only enrolled in one course; therefore, the focus of the survey was student perceptions of the instructor of that course.

Site and Number of Participants

According to the South Carolina Department of Education (2020a), the total CTE enrollment is 3,585 in the district. The Center was the site where the research was

conducted. Students who attended the Center were from one of the four high schools in the district. Table 1 represents the number of students at each school, total number of students enrolled in CTE courses, total number of CTE students at each high school, and total number of CTE students who attended the Center from each high school. Each school is identified with a pseudonym to protect the identity of the district and school.

Table 1

CTE Enrollment in the District 2020

Schools	Total students	Total CTE enrollment		Base school CTE enrollment		Center CTE enrollment	
	N	n	%	n	%	n	%
A	1,106	783	71%	463	59%	320	41%
B	1,670	1,070	64%	884	83%	186	17%
C	1,226	835	68%	686	82%	149	18%
D	1,473	896	61%	607	68%	289	32%

Each school offered a variety of CTE courses and completer programs to students. If a program was not offered at a school, students could apply to attend any of the high schools that offered the program of their interest. Students enrolled in School A totaled 1,106; 783 (71%) of those students were enrolled in CTE. Of those 783 students, 463 (59%) were enrolled in base school CTE, and 320 (41%) were enrolled in the Center CTE. Students enrolled in School B totaled 1,670; 1,070 (64%) of those students were enrolled in CTE. Of those 1,070 students, 884 (83%) were enrolled in base school CTE, and 186 (17%) were enrolled in the Center CTE. Students enrolled in School C totaled 1,126; 835 (68%) of those students were enrolled in CTE. Of those 835 students, 686 (82%) were enrolled in base school CTE, and 149 (18%) were enrolled in the Center CTE. Students enrolled in School D totaled 1,473; 896 (61%) of those students were enrolled in CTE. Of those 896 students, 607 (68%) were enrolled in base school CTE,

and 289 (32%) were enrolled in Center CTE.

Transportation was provided by the district for students to attend the Center. The Center operated on an A/B day schedule with students attending class every other day. Students attended in the morning or afternoon for a double-blocked class. A double-blocked class was 180 minutes of class instruction. Participants who participated in this study were randomly selected from the students attending the Center. As described in Chapter 4, multiple roadblocks occurred in obtaining an adequate sample size to fully address the research questions for this study.

Sampling Method and Generalizability

The sampling method used in this study was homogenous purposive, nonprobability, convenience sampling. Participants in this study had a shared characteristic. All participants selected were enrolled in a CTE course at the Center. The results cannot speak for all the students in the district enrolled in CTE courses. Clearly, this sample is not representative of the entire population of students enrolled in CTE courses in the district. One group may be overrepresented or underrepresented (i.e., males, females, races, students of poverty, grade levels, and ability levels).

Based on the type of sample chosen for this study, generalization to other populations is limited. Creswell and Creswell (2018) discussed convenience sampling is often less desirable but often selected because of convenience and availability; however, the generalization of a population in research may not be representative of the population (Etikan et al., 2016). In purposive sampling, not all individuals in the target population and study results are necessarily generalizable to the population.

Time Spent in Classroom

Many students were quarantined due to COVID-19 during the time of this study. Quarantine days ranged from 5 to 10 days, and the number of times a student could be quarantined was unlimited; therefore, this reduction in face-to-face contact may have impacted teacher-student relationships.

Use of Achievement Data

The achievement data utilized were based on the student's responses they reported on the survey about their cumulative average in the class. Students were expected to be honest on the self-report on the survey.

Utility of Theoretical Frameworks

The study focused on the interpersonal teaching behaviors during at least a semester period within a CTE course and how the student perceptions of teaching behaviors impacted their achievement. The frameworks were utilized for the sole purpose of examining the CTE students' perceptions of the CTE classroom teacher.

Delimitations

Delimitations result from specific choices made by the researcher (Simon & Goes, 2013). The focus of this study was to examine CTE student perceptions of CTE teachers' interpersonal behaviors occurring between students and teachers. The data recorded were from student perspectives only. This replication by extension study was intended to replicate and extend Madike's (2015) study to confirm or refute findings adding to generalizability.

Significance of Study

This study may be significant because it provides insight into CTE student

perceptions of teacher interpersonal behaviors and student achievement in CTE classes. During my research, studies were found in other academic areas such as math, science, and English as a Second Language (ESL) that examined student perceptions of teacher interpersonal behaviors and achievement, but I did not find any research that examined CTE student perceptions of CTE teachers. Hopefully, this research will aid in increasing CTE concentrators and/or completers, improve teacher-student relationships and student achievement outcomes, and be used for the development of meaningful professional development for CTE teachers.

CTE struggles with retaining students in the program to earn concentrators and/or completers (U.S. Department of Education, 2020). Research indicates that graduates who earned three or more CTE credits had a lower unemployment rate than their peers who earned fewer CTE credits (U.S. Department of Education, 2020). This research contributes to knowledge about student perceptions of CTE teacher interpersonal behaviors and could lead to understanding how these perceptions may impact student achievement and student retention in CTE programs. Additionally, teachers may gain insight into their interactions with students which will lead to self-reflective behavior.

The quality of the teacher-student relationship decreases from the age of 12 to 18, according to research (Bokhorst et al., 2010; Kenny et al., 2013; Tobbell & O'Donnell, 2013). Furthermore, adolescents who perceive social support from their teachers experience greater life satisfaction and less psychopathology in the form of externalizing behaviors (Stewart & Suldo, 2011). Research has also shown that positive teacher interpersonal behaviors and classroom environment influence not only students but also teachers (Telli, 2016). Teacher attrition is alarmingly high in secondary schools,

especially at the beginning of their careers (Gibbs & Miller, 2014; Jacobson, 2016; Skaalvik & Skaalvik, 2011). This study may also provide insight to teachers about the importance of understanding how their interpersonal behaviors impacts the classroom and the effect on discipline problems, which are a major concern for teachers (Gibbs & Miller, 2014; Jacobson, 2016; Skaalvik & Skaalvik, 2011). At the present, there is a paucity of research that examines CTE, and this study seeks to address this gap.

Local Problem

An ever-increasing number of high-skilled jobs nationally and in South Carolina do not have enough workers and skilled candidates to meet the workforce demand (Deveaux, 2018; South Carolina Department of Employment and Workforce, n.d.; SHRM, 2019). Demand exists for skilled workers because new technologies and global competition have contributed to the skill gap (SHRM, 2019). To address the shortage, more collaboration with secondary education institutions and employers may help to bridge the skills gap in the workplace.

CTE programs prepare students for postsecondary programs and the workforce by developing academic and technical skills. In the past decade, an increase in the interest in CTE has occurred. To ensure students are "college and career ready" when they graduate from high school, CTE has become more of a focus for policy makers and education leaders (Alfeld, 2016). As CTE continues to meet the needs of business and industry, data are needed for education leaders to support decision-making. Although South Carolina has seen a growth in jobs, a growing concern over labor shortages due to skill gaps in the labor force exists (Deveaux, 2018; South Carolina Department of Employment and Workforce, n.d.). Increasing the number of students completing completer programs, dual

credit opportunities, and industry-recognized certifications where skill gaps are identified may address the mismatch of jobs and skills.

This study contributes to the current research on teacher-student relationships as it relates to student perceptions of teacher interpersonal behaviors and student achievement. Research in the area of CTE is limited, and the information from this study can be used to examine how to improve teacher relationships with students and possibly narrow the gap in the workplace. According to Potvin (2019), despite widespread agreement on the importance of teacher-student relationships, teachers rarely engage in curriculum planning to address teacher-student relationships.

Professional Application

Designing lessons and implementing the curriculum is important in developing teacher practice; however, teachers must also develop communication techniques that are favorable to students (Wubbels et al., 1997). Both skills are equally important to be an effective teacher. This study seeks to provide valuable information to educators or any professionals working with children. Hopefully, the implementation of new strategies for improving classroom management and practices and building stronger positive teacher relationships will develop. For educators to fully develop, they should know and understand how they are being perceived by their students and be encouraged to switch to certain types of behaviors that are favorable to the learning environment (Wubbels et al., 1997). This study may be an indication for preservice and in-service programs to help teachers develop or improve their interpersonal skills associated with improving students academically, socially, and emotionally.

Social Change

Studies have found many benefits for students who enroll in CTE courses (Gottfried & Plasman, 2016; Jacob, 2017; Kriesman & Stange, 2017). The benefits include helping students develop specific skills related to postsecondary education and the workplace and increased income with earned certifications. Students who enroll in CTE courses are more likely to attend college and seek better employment opportunities (Gottfried & Plasman, 2016; Jacob, 2017; Parlier, 2019). Lower chances of dropout and increased chances of on-time graduation have been associated with student enrollment in CTE courses (Gottfried & Plasman, 2016; Parlier, 2019). These courses build a pipeline that can transition students to postsecondary education and provide a direct pathway to a career. Current research data on the teacher-student interaction in CTE programs may contribute to positive social change for students and faculty. This research may serve as a guide and encourage stakeholders to seek and implement pedagogy that can improve teacher-student relationships and promote professional training opportunities for teachers in the area of teacher-student relationships and student learning.

Summary

The purpose of this quantitative study was to examine student perceptions of their CTE teachers' interpersonal behaviors and their impact on student achievement. It was designed as a replication by extension study from Madike's (2015) study. Theoretical frameworks that ground this study were Leary's (1957) theory on interpersonal communication, systems communication (Watzlawick et al., 1967), and MITB (Wubbels et al., 1985). This study was significant because it may lead to understanding teachers' interpersonal behaviors in the CTE classroom and the impact of these behaviors on

achievement. It is possible this study may lead to discussion about how to improve the learning environment through the modification of teacher interpersonal behaviors.

Chapter 2 presents, analyzes, and summarizes literature related to studies of communication theories, learning environment, teacher-student interpersonal behaviors, and student achievement. The origin of the MITB and the validity and reliability of the QTI will also be discussed. In addition, Madike's (2015) original study is discussed.

Chapter 2: Literature Review

Overview

CTE is not about teaching a narrow set of skills; instead, it is about preparing students for a career (Dougherty & Lombardi, 2016). Students enrolled in CTE are provided the opportunity to develop skills necessary for today's labor market such as critical thinking, collaboration, problem-solving, innovation, teamwork, and communication (Brand et al., 2013). Moreover, students of all levels are provided a variety of viable options to help them to become college and/or career ready. Given its importance in the current educational landscape, one might ask what is the most viable factor in the success of CTE. The answer lies in teacher-student relationships. In fact, many studies have linked positive teacher-student interactions to increased cognitive outcomes (Brekelmans et al., 2002; Goh & Fraser, 1998; Passini et al., 2015; Wubbels et al., 1988). Furthermore, while many benefits have been associated with student achievement in CTE courses (Dougherty & Lombardi, 2016; Meer, 2007; Smalley & Sands, 2018; Stern et al., 2010; Symonds et al., 2011), research suggests teachers are the most important school-related factor (Hattie, 2012; Opper, 2019). CTE teachers engage students of all levels in the classroom. It is noted, CTE struggles with retaining students to complete concentrators which may be useful in addressing a gap in skills needed in the workforce (Deveaux, 2018; South Carolina Department of Employment and Workforce, n.d.; SHRM 2019). The purpose of this study, therefore, was to examine CTE student perceptions of teacher interpersonal behaviors and its relationship to achievement in CTE courses. The study was based on a study by Madike (2015) examining the same constructs.

Organization of Literature Review

This literature review includes an extensive review and discussion of communication theories, learning environments, student perceptions about learning, teacher-student relationships and student achievement, teacher interpersonal behaviors, the QTI instrument, CTE, and Madike's (2015) original study. A review of the theoretical frameworks includes interpersonal communication theory (Leary, 1957), systems communication theory (Watzlawick et al., 1967), and MITB (Wubbels et al., 1985). These theories are relevant to the educational setting because they deal with human interactions and how they impact one another. The literature review includes a variety of sources supporting each concept. Research studies link the learning environment to student learning outcomes, and the factors that contribute to a positive learning environment are reviewed (Brekelmans et al., 2002; Hattie, 2012; Wubbels, 2016). A summary of Chapter 2 concludes the final section.

Method for Searching the Literature

To begin the literature review for this study, the Gardner-Webb Library's Bulldog OneSearch was utilized. In the basic search, the following keywords were used: academic achievement, academic outcomes, adolescents, Carl D. Perkins, career and technical education (CTE), classroom environment, classroom environment and student outcomes, communication, communication theories, learning climate, learning environment, secondary education student achievement, teacher behavior, teacher-effectiveness, teacher-student relationships, teacher quality, positive learning environments, teacher interpersonal behaviors, technical education, and vocational education. Many articles were yielded from the basic search that introduced the concept of teacher and student

interaction and their impact on behavioral, social, and cognitive outcomes in various classroom settings. Articles introducing communication theories, learning environment, teaching behavior, and CTE were identified in the search.

These articles led to further examination of current peer-reviewed journal articles related to student perceptions of teacher-student interactions and how teachers affect achievement, systems communication theory, interpersonal theory, QTI, CTE, and MITB. Multiple databases were reviewed: Educational Resource Information Center (ERIC), Gardner-Webb Bulldog OneSearch, Google Scholar, National Center for Education Evaluation and Regional Assistance, Internet Archive, ResearchGate, SAGE Online Journals, World Scientific, and Z-Library. Keywords included career and technical education (CTE), secondary education effective teaching, secondary education effective teacher-student relationships, interpersonal communication theory, interpersonal teaching behaviors, interpersonal teaching behavior survey, learning environments, Model of Interpersonal Teacher Behavior (MITB), secondary education student achievement, secondary education student perceptions of learning, secondary education student perceptions of teaching and learning, systems communication theory, and Student Questionnaire on Teacher Interaction (QTI).

Leary's (1957) work was examined from internet archives, and print sources that addressed the work of Watzlawick et al. (1967), Moos (1974), Wubbels et al. (1993), and Horowitz and Strack (2011) were obtained. These sources provided critical information about human communication and the theoretical frameworks.

Communication Theories

The interpersonal communication theory and systems communication theory

describe how teachers and students interact in the classroom (Leary, 1957; Watzlawick et al., 1967). Teaching and behaviors displayed in the presence of someone else are considered forms of communication (Watzlawick et al., 1967). In an educational setting, communication is a part of the social interaction where every interaction has a content and a relationship aspect (Watzlawick et al., 1967; Wubbels & Brekelmans, 2005). The social or cultural context of a relationship, such as teacher and student, may set a complementary relationship (Watzlawick et al., 1967).

Complementarity is a key construct of the interpersonal behavior model (Tracey, 2004). The most common definition of complementarity is based on the interpersonal circle that all teaching behaviors are represented on the MITB. These teaching behaviors included leadership, understanding, helpful/friendly, student responsibility/freedom, uncertain, admonishing, dissatisfied, and strict. According to Tracey (2004), complementarity refers to the assumption each behavior rewards and constrains the behavior of the other person in a specific manner. For example, if the teacher is helpful/friendly, the behavior of the student will be helpful/friendly. Conversely, if the teacher is uncertain, the behavior of the student will be uncertain.

For this study, teaching was examined from the student perspective in terms of the relationship between teacher and students (Wubbels & Brekelmans, 2005; Wubbels et al., 1985). Wubbels and Brekelmans's (2005) communication systems approach and MITB are identified as central to this viewpoint. One important element of the systems approach is it focuses on the effects of communication on the other person involved, while the MITB focuses on the interpersonal behaviors related to communication (Wubbels & Brekelmans, 2005; Wubbels et al., 1985). Communicative behaviors are the teaching and

learning styles that occur when teachers and students interact within the classroom (Madike, 2015). As previously stated, communication is part of the social interaction that occurs in the classroom. The communication process helps to determine the quality of the effectiveness of teaching and learning.

Interpersonal Communication Theory

As mentioned earlier, interpersonal communication is defined as the overt communication events from one person and the social impact one has on another (Leary, 1957). The Leary (1957) model has been used extensively in describing human interactions (Strack, 1996). His model was later adapted by Wubbels et al. (1985) for educational settings. The MITB graphically represents interpersonal behaviors along two dimensions (Figure 1). The influence axis (vertical) is also known as "agency," and the proximity axis (horizontal) is also known as "communion." The influence agency (i.e., dominance-submission) dimension describes behaviors such as dominance, control, and power (Gurtman, 2016). The proximity communion (i.e., hostility-affiliation) dimension describes behaviors such as love, friendliness, and affiliation. These dimensions are useful in conceptualizing interpersonal behaviors (Gurtman, 2016). Figure 1 is a visual representation of the dimensions.

Wubbels et al. (1985) developed the MITB to describe student perceptions of teaching behaviors. The MITB is based on Leary's (1957) research in clinical psychology and how it applies to teaching (Horowitz & Strack, 2011; Strack, 1996; Wubbels et al., 1985). Leary's model did not manifest itself in the context of character traits; instead, his model focused on dyadic relationships. Therefore, Wubbels et al.'s (1985, 2012) teams chose to analyze human relationships from the interpersonal perspective that describes

and analyzes teaching in terms of the relationship between teacher and students. The principle of interpersonal dimensions and the principle of interpersonal complementarity are two key principles of the interpersonal theory (Watzlawick et al., 1967).

Beginning with Leary and supported by additional researchers, all human behavior and perceptions can be placed along two orthogonal (uncorrelated) dimensions which, when combined (i.e., intersected), form a circumplex structure (Gurtman, 2016; Horowitz & Strack, 2011; Leary, 1957). Although these dimensions have been referred to by many names, most researchers refer to them as agency and communion (Gurtman 2016; Pennings et al., 2018). For this study, the terms influence and proximity are used to refer to interpersonal behaviors on the MITB model because Wubbels et al. (1985) used those terms in their educational studies.

As stated earlier, the Leary (1957) model uses an influence dimension (Dominance, D – Submission, S) and proximity dimension (Cooperation, C – Opposition, O). The influence dimension (Dominance, D – Submission, S) is associated with the horizontal axis, and the proximity dimension (Cooperation, C – Opposition, O) is associated with the vertical axis (Leary, 1957). Later, Leary's model was adapted to form a model for interpersonal teacher behavior that uses the same axes of influence and proximity (Wubbels & Brekelmans, 2005; Wubbels et al., 1985, 2012; Wubbels & Levy, 1989). It is believed all teacher interactions can be plotted in this system of coordinates (Wubbels et al., 1985). Figure 2 shows the dimensions and eight sectors of teacher interpersonal behaviors on the MITB.

This model shows the Dominance, D – Submission, S and Cooperation, C – Opposition, O dimensions along with the eight sectors: leadership, helpful/friendly,

understanding, student responsibility/freedom, uncertain, dissatisfied, admonishing, and strict. Each sector has its own set of character traits that are useful in describing teacher interpersonal behaviors; hence, these behaviors involve human communication.

Systems Communication Theory

Communication is considered as all the behaviors someone displays in the presence of someone else (Watzlawick et al., 1967; Wubbels & Brekelmans 2005; Wubbels et al., 2006). To describe teacher behaviors in the classroom, the systems approach was adapted (Watzlawick et al., 1967; Wubbels & Levy, 1989; Wubbels et al., 1988). The systems approach has a content and a relation aspect. The content aspect conveys an idea, and the relation aspect interprets the content (Watzlawick et al., 1967). To further explain the content and relation aspects, when two people are together, whatever the intentions of the person, the other person will infer meaning from that person's behavior (Watzlawick et al., 1967). For example, a female student may ask the teacher a question from across the classroom while the teacher is busy taking attendance at the beginning of the class. The teacher does not answer the question because she does not hear the student. The student may infer the teacher ignored her, the teacher does not like her, or the teacher is rude. The message the student perceives from the teacher is very different from the teacher's intention. In this way, the effects of someone's actions on the other during communication is the focus of the systems approach (Watzlawick et al., 1967; Wubbels & Brekelmans, 2005; Wubbels et al., 2006); therefore, the focus is on how the message is received, not on how the message is intended.

The systems communication approach focuses on the pragmatic aspects of communication. Changes in one aspect are said to affect changes in another (Wubbels &

Brekelmans, 2005). This is the theoretical framework for studying teacher behavior (Brekelmans et al., 2005; Fisher et al., 1995; Wubbels et al., 1993). It begins with the assumption that in communication, the behavior of participants influences each other mutually. The focus of the pragmatic aspect is communication, meaning the student perception of the teacher is based on what occurs in the classroom and what students think about these occurrences. The systems approach to communication (Watzlawick et al., 1967) distinguishes communication on three different levels. These levels are ranked as follows: lowest, intermediate, and pattern levels.

The lowest level consists of the message level, which is the content and relation aspects. For instance, in the content aspect, the words "Let me teach you how to use the computer" can be combined with a facial expression (relation aspect). In the latter case, depending on the facial expression, this communication may be perceived as, "I think you are not smart enough to learn computer," or "I think you are very smart and can use the computer" (Burgoon & Dunbar, 2006; Marshall & Weinstein, 1986; Wubbels & Brekelmans, 2005). Content messages are more obvious because they are spoken words; relational messages are usually nonverbal. Relational messages deal with social needs (i.e., affection, control, inclusion, and respect) and because they are nonverbal can lead to ambiguity (Watzlawick et al., 1967).

The second level is the intermediate level, called interaction, which is a chain of several messages. For example, within a classroom interaction, a teacher calls on a specific student to answer a question, and another student consistently yells out the answer (Watzlawick et al., 1967). The teacher ignores the student who continues to yell out the answer and continues to call on the first student for the answer. Students may

recognize the teacher is trying to avoid confrontation and may expect there is some freedom within the classroom without confrontation with the teacher. This level is best described as two people communicating with each other (Watzlawick et al., 1967).

The pattern level shows recurrent patterns and some form of regularity. The pattern level is the highest level of human communication and can be measured with the QTI. In the teaching environment, the pattern level is important in describing the interpersonal relationship. According to Wubbels and Brekelmans (2005), a stable basis for reactions is because mutual perceptions are confirmed and reconfirmed. This study focused on student perceptions at the pattern level. Studies have been conducted using the QTI in secondary classrooms to examine the perceptions of teachers and students at the pattern level (Wubbels et al., 1985).

Learning Environments

Studies of classroom learning environments started to blossom during the 1970s and grew out of research from Rudolf Moos. Moos (1974) provided a springboard for studies on the classroom learning environment. The social climate within which a person functions may have an important impact on one's social, personal, and intellectual development (Moos, 1974). Research on conception and assessment of the learning environment has developed rapidly (Fraser, 1998; Ghosh, 2015). Learning environment research has been grounded in the psychosocial context and has been proven to address educational issues (Kline et al., 2017).

The learning environment is the context in which learning occurs (Bryne et al., 2001). Classroom environment scales have been used in a variety of studies as sources to determine the success of various classroom settings (Fraser, 1986; Fraser & Goh, 2003;

Ghosh, 2015). Learning environment research has examined academic achievement in the cognitive and affective domains (Doppelt & Barak, 2002). The use of student perceptual data has established consistent relationships between the learning environment and student achievement (Fraser, 1986, 2002; Goh & Fraser, 1998; Wubbels & Brekelmans, 1998; Wubbels et al., 1993).

According to Fraser (1986), students have spent enough time in a classroom to develop accurate impressions. Wong et al. (1997) found classroom environment contributes greatly to student outcomes. In other words, student outcomes can be strengthened by improving the classroom environment in ways that meet the needs of the students (Wong et al., 1997). According to Eccles and Roeser (2011), as students pass through secondary school, the environment becomes less supportive and less motivating for all except the highest-ranking achievers.

A prior condition to learning is to achieve a positive, caring, and respectful classroom (Hattie, 2012). Various factors in the learning environment influence learning outcomes, including class size, class arrangement, instructional methods, learning styles, and assessment methods (Doppelt & Barak, 2002; Fraser, 1986, 1998; Pianta et al., 2012; Zandvliet & Fraser, 2004). These factors create the social and physical qualities that determine the classroom experience (Ghosh, 2015; Kline et al., 2017). In addition to these social and physical factors that can impact achievement, affective factors should be considered as well. For example, academic achievement may be impacted positively when the classroom environment is perceived as warm and caring and negatively when the opposite is the case (Fauth et al., 2014; Wang & Holcombe, 2010).

Likewise, the CTE classroom learning environment is like other learning

environments. Classroom learning environments vary extensively in CTE classrooms in terms of type of school, course, class size, teacher certification and license, grade level, and school culture (Doppelt & Barak, 2002); however, the CTE learning environment may additionally differ from a content-oriented classroom (i.e., math, science, social studies, and ESL) in significant ways. For example, the physical design of a CTE classroom design ranges from the basic classroom setup with desks, tables, and chairs to a classroom that simulates a workplace setting. As stated previously, the learning environment influences student learning outcomes (Fisher et al., 1995; Fraser, 1998). Gender differences have been identified as part of the CTE classroom learning environment. These differences occur in many nontraditional CTE courses (i.e., auto technology, biomedical science, engineering, technology, and welding) where most students are males (Fluhr et al., 2017). CTE classroom learning environments vary based on the CTE curriculum. For example, a welding classroom design may include welding booths and a dedicated student learning area or classroom space.

The interpersonal relationship between teacher and students contributes to the learning process of students in the classroom environment (Brekelmans et al., 2002). According to Cetin-Dindar et al. (2016), the classroom learning environment significantly influences student learning outcomes. Students who experience a favorable learning environment may experience increased learning outcomes (Fraser, 1998, 2012). The type of classroom environment has a significant influence on student learning outcomes (Fraser, 1998, 2012).

Fraser (1998) defined the advantage of the student and teacher perspectives of the learning environment:

Defining the classroom or school environment in terms of the shared perception

of the pupils and teachers has the dual advantage of characterizing the setting

through the eyes of the participants themselves and of capturing data, which an

external observer could miss or consider unimportant. (p. 528)

As previously stated, the interpersonal relationship between teacher and students

influences the learning environment. The advantage of teacher and especially student

perspectives of the learning environment is they provide a firsthand account of what

happens in a classroom setting, limiting misinterpretation. How students perceive the

classroom environment has been determined to have merit (Fraser, 2001; Goe et al.,

2008); therefore, student perceptions of the learning environment may provide crucial

information that may help improve student outcomes. Significant progress has been made

in the investigation of learning environments (Brekelmans et al., 2002; Fraser, 2002;

Fraser & Goh, 2003). Indeed, student perceptions about learning can greatly impact

success in the classroom.

Student Perceptions About Learning

Student perceptions have been an important data point since the 1950s; however,

prior studies focused mainly on the following areas: science, math, ESL, and the learning

environment. According to Allport (1961), perception is personal, and a great deal of our

selectivity is related to our own self-esteem. The working memory is influenced by

perception when information enters (Adediwura & Tayo, 2007). How the information is

perceived depends on the background information that triggers the reactions. Individual

attitudes determine what a person thinks and feels and how the person behaves toward

others (Etuk et al., 2013). Student perceptions of their learning environment influence

how and to what extent they learn and retain knowledge (Luketic & Dolan, 2013).

Student perception is frequently used to measure classroom practices because student

classroom experiences are based on their own judgments and insights (Maulana et al.,

2015).

Based on prior research, student perceptions of the learning environment can be

both reliable and predictive of learning (Fauth et al., 2014; Measures of Effective

Teaching (MET) Project, 2012; Samdal et al., 1999; Wagner et al., 2013). In like manner,

according to Tshewang et al. (2016), student perceptions of learning environments can

significantly influence student learning outcomes. Clearly, student perceptions are

meaningful, readily accessible sources of information for improving the classroom

environment (Nelson et al., 2015). The classroom environment may affect many aspects

of the classroom (e.g., student engagement, self-efficacy, motivation to learn, and

academic achievement; Fauth et al., 2014; Wang & Holcombe, 2010). Establishing a

positive, caring classroom environment, therefore, is reinforced by research that connects

positive teacher-student interactions to academic and social success (Hafen et al., 2015;

Iruka et al., 2010).

Previous studies indicate that when students feel emotionally supported, they are

more likely to enjoy learning, demonstrate motivation, and display on-task behaviors

(Farmer et al., 2011; Raufelder, Scherber et al., 2016; Ryan et al., 2005). Studies have

also been conducted to discover the perceptions of students about their schools and

teachers (Gorard & See, 2011; Samdal et al., 1999; Wentzel, 1997). Studies in which

students perceived teachers to be supportive and caring have been linked to increased

motivation, academic outcomes, and effort because students experience less distress and

negative affect when presented with academic and social challenges at school (Breeman et al., 2015; Murdock & Miller, 2003; Wentzel, 1997, 1998). Indeed, according to Danielsen (2010), teachers provide the basis for a supportive climate for the class; however, some school classes provide more favorable environments for the development of academic initiative than others. Student perceptions guide their own learning, and based on their insight, their perspective may actually be more accurate than what others would observe (André et al., 2020).

Finally, studying the classroom environment considers the teacher-student relationship (Sivan & Chan, 2013). The relationship dimension is concerned with measuring teacher behaviors in the classroom environment from the interpersonal perspective.

Teacher-Student Relationship and Student Achievement

The importance of the teacher-student relationship and achievement has been linked to a range of educational settings from elementary to university. Teacher-student relationships are fundamental to the learning environment (Longobardi et al., 2016). Clearly, the quality of the teacher-student relationship plays a crucial role in teaching and learning (Wallace et al., 2016; Pennings et al., 2018). In fact, positive relationships with adults are perhaps the single most important ingredient in promoting positive student development (Pianta et al., 2012). Sarason (1996) suggested that to improve educational outcomes, a top priority should be given to the teacher-student relationship.

An element of Moos's relationship dimension in human environments is the teacher-student relationship (Wubbels, 2016). In this paradigm, students and teachers attach to their interactions with each other, and thus these relationships can be assumed to

originate in these interactions (Wubbels, 2016). Whether a student perceives the teacher as being helpful or chastising affects the student's academic performance (Student Perceptions of School, n.d.). All in all, students who perceive their teachers as caring are academically more successful and show greater pro-social behaviors (Orpinas & Raczynski, 2016; Pelayo et al., 2017). A large body of research exists on the link between teacher-student relationships and academic outcomes (Allen et al., 2013; Breeman et al., 2015; Gehlbach et al., 2012; Hattie, 2002; Hughes, 2012; Maulana et al., 2015, Roorda et al., 2011; Sammons & Bakkum, 2011; Suldo et al., 2014; Wentzel et al., 2010). Research has shown positive teacher-student relationships are associated with increased academic skills and could be perceived as a positive factor against school dropout and better student outcomes (Crosnoe et al., 2004; Lessard et al., 2010).

Furthermore, research has shown a decline in the teacher-student relationship when students move from elementary to secondary school (Eccles et al., 1993; Gehlbach et al., 2012). Adolescents desire a growing need for close emotional relationships with adults from outside the home environment with nonfamilial adults (Eccles, 1999; Raufelder et al., 2013; Zimmer-Gembeck et al., 2006). Given the importance of student perceptions of the learning environment, student reports of the quality of interactions and processes within a classroom are potentially an important measurement strategy for evaluating and developing teachers (Ferguson & Danielson, 2015; Gaertner, 2014; Goe et al., 2008; Goe & Croft, 2009; Peterson et al., 2000). As previously stated, a decrease in the quality of positive teacher-student relationships is noted as students transition from middle to high school (Feldlaufer et al., 1988; Niehaus et al., 2012; Rudasill et al., 2010). This may be attributed in part to changes in the school structure (e.g., larger class size,

individual contact with teacher is decreased).

In less favorable situations, student experiences in classroom settings (observed or reported) are often lacking in terms of meaningful challenges, supportive relationships, and competence-building opportunities (Crosnoe et al., 2004). Allen et al. (2013) linked teacher interactions to future achievement by focusing on classroom experiences that are emotionally and intellectually engaging to the adolescent. Students who have positive relationships with teachers tend to have higher school performance than their peers who have negative teacher-student relationships (DiLalla et al., 2004).

In all these instances, teacher behaviors predict student learning and cognitive outcomes (Maulana et al., 2015; Panayiotou, 2014). In fact, the greatest source of variance in the classroom that can make a difference is the teacher (Hattie, 2003). Hattie's (2009) synthesis of over 800 meta-analyses relating to student achievement in school-age students showed 19 variables of the top 30 related to teachers or teaching with an effect size above 0.5. Martin et al. (2009) concluded in their study that interpersonal relationships tended to be positively and significantly associated with academic and nonacademic measures; therefore, studying the classroom environment must consider the teacher-student relationship.

Teacher Interpersonal Behavior

Alongside being a place of learning, many significant interpersonal relationships are developed in the classroom (Longobardi et al., 2016). Teacher interaction with students is one of the daily functions of a teacher. Ko and Sammons (2013) identified students as one of the key stakeholders in education. Interpersonal relationship support from teachers is related to important academic outcomes and skill development (Košir &

Tement, 2013). Teaching behavior is one of the most prominent factors affecting student learning and achievement (Brekelmans et al., 2005; Hattie, 2009, 2012). In addition to student achievement, teacher interpersonal behavior is critical in creating and maintaining a positive classroom environment (Brekelmans et al., 2002; Sammons & Bakkum, 2011; Wubbels et al., 1993). The teacher is one of the most powerful influences in the classroom (Hattie, 2002, 2003, 2012), and how the teacher behaves influences student learning and achievement (Fernández-García et al., 2019). Mapping teacher behaviors using questionnaires has been consistently utilized in determining teacher interpersonal behaviors. During adolescence when the need for positive relationships with adults outside the home is strong, teachers serve as adult role models for students (Midgley et al., 1989; Raufelder et al., 2013). Raufelder, Nitsche et al.'s (2016) findings show that students prioritize a teacher's (inter) personal dimensions over their academic abilities in everyday classroom interactions when evaluating them as an educator. Teacher behavior in the classroom and how students perceive that behavior can influence student outcomes. Kuklinski and Weinstein (2001) conducted a study that supported the notion that how a teacher behaves impacts a student's social, emotional, and academic outcomes. According to Kuklinski and Weinstein, in some classrooms, teachers treat higher-performing students differently than lower-performing students.

Student perceptions may provide the most meaningful and insightful information about teaching behaviors (Eccles et al., 1993; Pössel et al., 2013; Wubbels & Levy, 1991). Studies indicate student perceptions are more predictive of student outcomes than external observations (De Jong & Westerhof, 2001; Seidel & Shavelson, 2007). As opposed to snapshot data gathered during discrete observations, student perceptions may

provide insight into typical patterns of teaching behaviors (Wubbels & Levy, 1991). Furthermore, some students are familiar with specific teaching behaviors because of daily interactions, while observers may not be (Goe et al., 2008).

Students' Perceptions of Interpersonal Behavior

Students perceive teacher work and merit from their own point of view. This perception is different from how they envision administrators, other teachers, researchers, and parents (Peterson et al., 2000). According to Brekelmans et al. (2005), more insight into the factors that affect student learning may be obtained through student perceptual data. With this in mind, according to Wubbels (2016), student perception is defined as inferences about the traits of a teacher and observation of the teacher behavior in the classroom. Furthermore, adolescents who experience supportive teachers tend to have greater life satisfaction (Stewart & Suldo, 2011). Regardless, student perceptions of the teacher can impact feelings of comfort, happiness, threat, or motivation (Fraser, 2001). These perceptions can change based on the student's age. For example, adolescents perceive their teachers as less friendly, supportive, warm, and caring than younger students (Eccles et al., 1993; Rudasill et al., 2010).

According to Tobbell and O'Donnell (2013), interpersonal and learning relationships are sometimes perceived by secondary students as lacking basic behaviors necessary to create positive interpersonal relationships. It is interesting to note that student interpretations of their teacher's behaviors may be affected by individual differences among students (Marshall & Weinstein, 1986). In addition, Telli (2016) examined the degree to which various aspects of teacher interpersonal behaviors related to student attitudes towards a specific subject. In other words, the interpersonal behaviors

of the teacher are perceived differently by students based on the subject matter taught. For example, Telli's study reported students in science, literature, and language typically perceive teacher behaviors more positively on the influence dimension (dominance-submission) than students in the arts and sports. On the other hand, all four subjects were positively associated with the proximity dimension (opposition-cooperation).

Thus far, we have established that valid and trustworthy evaluations of teaching practices and behaviors can be provided from student perceptions (Marsh, 2011; Peterson et al., 2000). Peterson et al. (2000) indicated the use of student perceptions is valid and reliable across grade levels. An important factor is the daily interaction between student and teacher (Ferguson & Danielson, 2015; Gaertner, 2014; Goe et al., 2008; Peterson et al., 2000). Furthermore, students have experience in different classrooms with various teachers; therefore, their judgment of teaching behaviors has merit (Fraser, 2001; Goe et al., 2008). Because of these factors, valuable insight into the teaching and learning environment of a classroom can be provided from student survey instruments measuring perceptions (Burniske & Meibaum, 2012).

Origin of the MITB

Many countries have utilized the MITB to map various teacher interpersonal behaviors, including Australia, Singapore, Turkey, the Netherlands, and the U.S. (Fraser, 2000; Passini et al., 2015; Wubbels & Brekelmans, 2005; Wubbels & Levy, 1989; Wubbels et al., 1997). Based on the interpersonal communication theory, Wubbels et al.'s (1985) research on teaching behaviors and their impact on the learning environment created a better understanding of teacher behaviors. Wubbels et al. (1985) developed the MITB where every interactional teacher behavior is placed on one axis on the model. The

model was extrapolated from Leary's (1957) MITB.

On the MITB, two general aspects of teacher behaviors are represented: the instructional-methodological aspect and the interactional aspect (Claessens et al., 2016; Passini et al., 2015). The instructional-methodological aspect consists of curriculum planning, classroom management, grading and feedback, the delivery methods of the content, and instructional strategies (Reich, 2014). The interactional aspect links to teachers as individuals. It consists of personal values, emotions, and attitudes of the teacher (Reich, 2014). The latter is connected more to teacher interpersonal behavior than the former. Furthermore, the teacher's personal values, emotions, and attitudes are important in the teacher-student relationship (Wubbels et al., 1985).

Teacher behavior is mapped through the MITB's two orthogonal bi-dimensional axes: influence (dominance-submission) and proximity (opposition-cooperation; Wubbels & Brekelmans, 2005; Wubbels et al., 1985). These two axes are represented in a coordinate system divided into eight sectors (see Figure 2). Eight types of teacher behavior are represented on the two axes: leadership, helpful/friendly, understanding, student responsibility/freedom, uncertain, dissatisfied, admonishing, and strict (Maulana et al., 2015; Wubbels & Brekelmans, 2005; Wubbels et al., 1985; see Figure 2). Every teacher behavior can be placed within these two axes (Horowitz & Strack, 2011; Reich, 2014; Wubbels & Levy, 1989). Sectors are labeled according to their position in the coordinate system OD, DO, etc. (much like directions on a compass). For example, the sectors "admonishing" and "strict" are both characterized as opposition and dominance. The OD sector (admonishing) includes behavior that is corrective and punishable, whereas in the DO (strict) sector, dominance prevails over admonishing to include

behavior that is rule-bound. The eight sectors are shown in Figure 2.

According to complementarity, each behavior on the MITB influences the behavior of the other person. The behaviors are clearly depicted in Figure 2.

The Wubbels et al. (1985) study suggested teacher behavior influences the interaction patterns of the classroom. In this study, the primary goal was to determine how the teacher's behavior impacted the student behavior in the classroom and what communication patterns of the teacher caused undesirable student behaviors. The focus of the study was teacher behavior and how it is the teacher who must make necessary behavior changes. According to Reich (2004), teachers can change their behavior and make the necessary adjustments to solve problematic teacher-student relationships. Based on this model, Wubbels et al. (1985) developed the QTI to measure student perceptions regarding the interaction of teachers.

Student perceptions of teacher interpersonal behaviors have shown a strong and positive relationship between student perception and cognitive outcomes (Madike, 2015; Passini et al., 2015; Wubbels & Brekelmans, 2005). Several interpersonal behaviors such as leadership, helpful/friendly, and understanding domains have been found to have positive correlations on cognitive outcomes (Madike, 2015; Passini et al., 2015; Wubbels & Brekelmans, 2005). Wubbels and Brekelmans (2005) also found the more teachers were perceived as cooperative, the higher students scored on cognitive tests. Behaviors associated with positive domains included open, friendly, enthusiastic, attentive, dependable, and patient (Wubbels et al., 1985). The QTI is a useful tool to measure student perceptions of their teacher interpersonal teaching behaviors.

QTI

Since the passage of the Every Student Succeeds Act (ESSA, 2015), there has

been a notable increase in the usage of student perception surveys–instruments given to

elementary and secondary school students to evaluate their teachers (Geiger & Amrein-

Beardsley, 2019). Student perception surveys have become a popular tool to measure

teacher quality in K-12 and have become an integral part of state and district formal

teacher evaluation processes. To measure student perception in the classroom, many

instruments have been developed such as the Tripod, part of the Bill & Melinda Gates

Foundation Measures of Effective Teaching (MET) study, and a survey from Youthtruth,

a national nonprofit agency that provides student and stakeholder feedback. Surveys are a

less time-consuming method to measure student perceptions of teaching quality than one-

to-one interaction (Goe et al., 2008). Student perception surveys are used to obtain

student perspectives about various aspects of teaching behaviors and the learning

environment. As previously stated, Wubbels et al.'s (1985) model was used to create an

instrument measuring student perceptions of teacher interactions–the QTI.

The QTI has been used in various countries including the Netherlands, Australia,

and the United States since the 1980s (Wubbels & Brekelmans, 2005). Three versions of

the QTI have been created. First, the original Dutch version consisted of 77 items to be

rated on a 5-point Likert scale from "never" to "always"; it was later reduced to a 64-item

version (Wubbels & Brekelmans, 2005; Wubbels & Levy, 1991; Wubbels et al., 1997).

This instrument has been adapted and translated into various language versions (Dutch,

English, French, Greek, Hebrew, Malay, Korean, and Turkish) and has been shown to be

valid and reliable (Passini et al., 2015). According to several studies, the internal

consistency Cronbach alpha coefficients ranged from .63 to .88 (Fisher et al., 1997;
Passini et al., 2015; Wubbels & Levy, 1991). In validating the QTI, individual and class
mean reliabilities were computed (Passini et al., 2015). Fisher et al. (1997) used a one-
way ANOVA to differentiate between student perceptions in different classrooms to
determine the QTI validity (p <.001).

The 48-item QTI was designed according to the MITB eight sectors, each sector
describing different teaching behaviors exhibited by teachers. For each sector, six items
are associated with leadership, helpful/friendly, understanding, student responsibility/
freedom, uncertain, dissatisfied, admonishing, and strict domains.

The functionality of the QTI self-reporting questionnaire makes the instrument a
valid tool to assess student perceptions of teacher classroom behaviors and teacher
interactions with their students (Laci, 2015). Fraser (2001) promoted the use of the
questionnaires and the importance of student perceptions of the classroom environment.
For example, the 48-item QTI addresses statements specifically about a teacher's
teaching behaviors. The questionnaire provides information specifically related to teacher
behaviors in the classroom.

Positive and Negative Domains

The QTI has been used in many countries to determine teachers' interpersonal
behaviors. Studies have shown student perceptions of teacher's interpersonal behaviors
are associated with academic achievement (Brekelmans et al., 2002; Fraser et al., 2010;
Madike, 2015; Passini et al., 2015; Wubbels & Brekelmans, 2005; Wubbels & Levy,
1989, 1991). Passini et al. (2015) administered the 64-item American QTI using a 7-point
scale ranging from 1 (never) to 7 (always). The study revealed academic achievement

was positively correlated with leadership, helpful/friendly, understanding, and student responsibility/freedom and negatively with uncertain, dissatisfied, admonishing, and strict. The more positive leadership, helpful/friendly, understanding, and student responsibility/freedom, the more positive academic achievement (Passini et al., 2015).

According to Wubbels and Brekelman's (2005) paper investigating teacher-student relationships in secondary schools using the QTI, high student outcomes were associated with leadership, helpful/friendly, understanding, and, to a lesser degree, student responsibility/freedom. Dissatisfied and admonishing behaviors were related to lower academic performance (Wubbels & Brekelmans, 2005). Student outcomes related to uncertain were found to be negatively related to student cognitive outcomes (Wubbels & Levy, 1989). Wubbels et al.'s (1991) study revealed that the more teachers exhibited leadership, helpful/friendly, and strict behaviors, the higher cognitive outcomes. On the other hand, student responsibility/freedom, uncertain, and dissatisfied behaviors related negatively to cognitive outcomes in Wubbels et al.'s (1991) study. According to Fraser et al. (2010), students in management courses perceived their teacher as exhibiting higher behaviors in understanding, leadership, and strict.

Madike's (2015) study reported teachers exhibited strong skills in leadership, understanding, and helpful/friendly behaviors and less admonishing, uncertain, and dissatisfied behaviors. His study indicated a significant positive correlation between grades and student perceptions of leadership, understanding, and helpful/friendly. On the other hand, a negative correlation between grades and student perceptions of teacher behaviors was revealed in uncertain, admonishing, dissatisfied, and strict behaviors. Student responsibility ($p > .05$) did not reveal a significant correlation between grades

and student perception.

Across studies, leadership, understanding, and helpful/friendly domains were associated positively with student academic outcomes. Uncertain, admonishing, and dissatisfied behaviors were associated negatively with student academic outcomes. Student responsibility/freedom behavior was associated positively with cognitive outcomes in Passini et al.'s (2015) study. According to Wubbels et al. (1991), student responsibility/freedom behavior was negatively associated with cognitive outcomes; therefore, student responsibility/freedom behavior may have a positive or negative impact on cognitive outcomes. The strict domain has also been associated both positively and negatively with student outcomes (Passini et al., 2015; Wubbels et al., 1991). Student responsibility/freedom and strict domains may be positive or negative and may or may not affect cognitive outcomes.

CTE

CTE provides unique opportunities for high school students based on their interests, goals, and career aspirations (U.S. Department of Education, 2019a). It is designed to prepare students for careers and professions that connect with postsecondary programs or additional training after high school (Dougherty & Lombardi, 2016). CTE provides students the opportunities to explore career opportunities that may lead to more specialized training beyond high school (U.S. Department of Education, 2019a).

The first authorization for federal funding of vocational education was the Smith-Hughes Act of 1917 (Perkins Collaborative Resource Network, n.d.-b). Initially, the act was meant to increase learner access to high-quality CTE programs of study and to improve academic and technical achievement for students. In 1963, the original

Vocational Education Act was passed. It was renamed the Carl D. Perkins Act in 1984.

The Carl D. Perkins Act of 1984 continues to fund CTE today. In 2018, President Trump signed the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) Public Law 115-124 (Perkins Collaborative Resource Network, n.d.-b). Importantly, this reauthorization provided nearly $1.3 billion annually for CTE programs throughout the nation (Perkins Collaborative Resource Network, n.d.-b). Perkins V expanded CTE opportunities by providing funding for every student to have the opportunity to participate in CTE programs (Perkins Collaborative Resource Network, n.d.-b; Stump, 2018).

Historically, CTE courses have an overrepresentation of students of color and lower-income students (Dougherty & Lombardi, 2016; Fraser, 2008). African American, Latino, and lower-income students are often among those who are considered as potentially benefiting from CTE programs (Dougherty, 2015; U.S. Department of Education, 2019b). This fact led to the adoption of more federal funding and innovative curriculum as it relates to CTE (Dougherty & Lombardi, 2016). Studies have shown that students who have access to these programs develop skills and experiences to better prepare them for the labor force after high school and earn higher wages than those who did not participate in CTE (Meer, 2007; Smalley & Sands, 2018; Stern et al., 2010; Symonds et al., 2011).

The reauthorization of the Elementary and Secondary Education Act as ESSA (2015) has made CTE gain more attention in education. CTE is included in the federal government's definition of a "well-rounded education" along with traditional classes (ESSA, 2015, Section 8002). States can direct more federal funding toward programs that

support CTE (Dougherty & Lombardi, 2016). The federal government recognizes the benefit of CTE in the areas of economic growth and employment opportunities (Dougherty & Lombardi, 2016). Additionally, in some states, CTE standards are aligned with academic standards, strengthening the integration of CTE and academics. Those positive changes indicate CTE may lead to bridging the gap between potential employees and the workforce.

According to Carnevale et al. (2017), a bachelor's degree is not required for 30 million jobs in the United States paying a median salary of $55,000 or more. The Consolidated Annual Report developed by the U.S. Department of Education allows eligible agencies to submit important narratives about performance and financial data reports specifically related to CTE (Carnevale et al., 2017). In 2018-2019, the Consolidated Annual Report reported that 8 million of America's 15 million high school students participated in CTE courses, and only one in five high school students chose to concentrate in a CTE program of study (U.S. Department of Education, 2019a). Students who earn at least two course credits in a single career CTE subject complete a concentrator (Carnevale et al., 2017; South Carolina Department of Education, 2020b).

ESSA (2015) and Perkins V (2018) show unprecedented support for CTE by requiring coordination of federal, state, and local agencies in supporting the integration of academic and CTE coursework (Perkins Collaborative Resource Network, n.d.-a). States are encouraged to include the progress of students in attaining CTE proficiencies on state report cards (Perkins Collaborative Resource Network, n.d.-a). Research shows CTE helps improve academic performance, prepares students for postsecondary education, and boosts earnings after high school, especially for students of color and low-income

students (Dougherty & Lombardi, 2016; Meer, 2007; Smalley & Sands, 2018; Stern et al., 2010; Symonds et al., 2011). Many states are taking steps to invigorate CTE to address the skill and workforce gaps (Carnevale et al., 2017; Meer, 2007; South Carolina Department of Education, 2020b).

Description of CTE Teachers

CTE teachers must complete an approved educator preparation program, have a bachelor's degree in the field in which they teach, and receive passing scores on required subject tests and pedagogy assessments (South Carolina Department of Education, 2022). Alternative programs for individuals who have a bachelor's degree but did not complete an approved educator preparation program may pursue certification in alternative ways. In addition to passing scores on subject tests and pedagogy assessments, CTE teachers may be required to have a certification or license related to their program (U.S. Bureau of Labor, 2022). For example, a business/technology teacher may be required to have certification(s) in any of the areas: Microsoft Office Specialist (MOS), C++ programming language, or Hypertext Markup Language (HTML), depending on the courses or programs offered at the school. CTE programs may or may not have a certification associated with the program. Programs such as culinary, cosmetology, welding, and health occupations require the teacher to pass an examination for a license to teach in specific content areas.

To help students learn and develop skills, CTE teachers must use a variety of teaching methods related to their specific program area. They are expected to integrate academic skills with teaching technical content. Demonstration and how to do specific tasks such as taking blood pressure, changing a tire or oil, applying makeup, and

preparing a meal are typical activities CTE teachers oversee in workshops or laboratories.

Finally, CTE teachers sponsor and advise federally funded Career and Technical Student Organizations related to their program. Career and Technical Student Organizations support the CTE curriculum by providing various opportunities for students at the local, state, and national levels. For example, Health Occupations Student of America is for students interested in health careers, and Future Business Leaders of America is for students interested in business careers. Those organizations help students build academic, leadership, and program-specific skills.

Professional development opportunities for CTE teachers are available at the district, state, and national levels to advance knowledge in their program area and develop leadership. Conferences, publications, webinars, blogs, and online learning support CTE teachers in the classroom (Association for Career & Technical Education, 2022).

Description of Madike's (2015) Study

Madike (2015) conducted a quantitative study that focused on teacher-student interactions among students enrolled in undergraduate biology classes and whether relationships existed between teacher-student interactions and student achievement. Madike wanted to determine which teacher-student interactions students were related to better achievement in the classroom. Three research questions were formulated for his study:

1. How do students perceive the interpersonal behaviors of the instructors of their introductory biology courses?

2. What is the relationship between students' perceptions of teacher

interpersonal teaching behavior and student achievement in introductory

biology courses?

Null Hypothesis 2 ($H_0 2$): Student perceptions of teacher interpersonal

teaching behavior will not be related to student achievement.

Alternate Hypothesis ($H_1 2$): Students' achievement will be positively

related to students' perceptions of teacher interpersonal behaviors in

introductory biology courses.

3. Do student perceptions of teacher interpersonal behavior differ based upon

student achievement levels in introductory biology courses?

Null Hypothesis 3 ($H_0 3$)*:* Students' perceptions of teacher interpersonal

behavior do not differ based upon students' achievement levels in

introductory biology courses.

Alternate Hypothesis 3 (H13): High achieving students (attaining grades

of As and Bs) will rate their teachers' interpersonal behavior significantly

more positively than low achieving students (students receiving grades of

Cs, Ds, and Fs).

The conceptual frameworks used to support Madike's study were the interpersonal

communication theory and the systems communication theory.

Madike's (2015) study was conducted with 318 students enrolled in a community

college in a mid-Atlantic state. Madike used the single-stage purposive sampling method

to select participants. The first phase of the research was the distribution of consent

forms. Madike administered the consent forms and the QTI on the final night of class.

The second phase was the analysis of the data using the Statistical Analysis Package,

version 22. To analyze the data, descriptive statistics, nonparametric Spearman's

correlations, and Mann-Whitney U tests were conducted. The descriptive statistics used

to address Madike's first question, "How do students perceive the interpersonal behaviors

of the instructors of their introductory biology courses," included an examination of the

means, standard deviations, minima, and maxima for the eight dimensions. Madike

performed the nonparametric Spearman's correlations to address his second question,

"What is the relationship between students' perceptions of teacher interpersonal teaching

behavior and student achievement in introductory biology courses." This test allowed him

to examine the relationship between student achievement and the eight teaching

behaviors (leadership, understanding, uncertain, helpful/friendly, student

responsibility/freedom, dissatisfied, admonishing, and strict) on the QTI. To address the

third question, "Do student perceptions of teacher interpersonal behavior differ based

upon student achievement levels in introductory biology courses," Madike used the

Mann-Whitney U test to determine if student perceptions of teaching behaviors differed

based on grades (high or low).

Madike's (2015) research findings indicated significant relationships existed

between student perceptions of teaching behaviors and student achievement. Students

reported teachers exhibiting the following teaching behaviors: leadership, understanding,

helpful/friendly, and student responsibility/freedom. The findings for Question 2

indicated a significant positive correlation between achievement and the teaching

behaviors of leadership, understanding, and helpful/friendly. As grades increased,

students perceived teachers as exhibiting higher degrees of behavior in leadership,

understanding, and helpful/friendly and lower degrees in uncertain, admonishing,

dissatisfied, and strict. The findings for Question 3 indicated that several teaching behaviors have a significant effect on grade levels. Students with higher grades reported their teachers as being higher in leadership, understanding, and helpful/friendly and lower in uncertain, admonishing, dissatisfied and strict. Madike's study indicated no significant correlation between student perceptions of student responsibility/freedom and student achievement ($p > .05$) for Questions 2 and 3. The null hypotheses were rejected for Questions 2 and 3, and the alternative hypotheses were supported.

Madike (2015) suggested his data could be used as a guide to improve classroom practices, teacher-student interactions, and instructional strategies and pedagogy. Madike recommended the QTI be used as a self-reflection tool for teachers and integrated into use as a professional development tool for biology faculty members.

Summary

Chapter 2 began with an overview of the purpose, problem, and questions, followed by the organization of literature and strategy used for searching the literature. Literature that covered social sciences broadly and explicitly included education, as well as the disciplines of psychology, sociology, and economics, were reviewed. A variety of databases were used to narrow and limit the research for my study. Scholarly peer-reviewed articles and journals and books were the sources for the literature review.

Two communication theories, Leary's (1957) model of interpersonal communication and systems communication theory (Watzlawick et al., 1967) were used as the theoretical frameworks. The communication theories were used to describe how teachers and students interact. These theories help to explain the importance of teacher-student interpersonal relations in the learning environment. The origin of these two

theories was traced from clinical psychology to their adaption to education (Wubbels et al., 1985). MITB was also used as a framework to explain teacher interpersonal behaviors in the classroom.

A summary of literature relating to the learning environment that includes student perceptions about learning, student-teacher relationships and achievement, and teacher interpersonal behaviors was discussed. The review showed the importance of student perception as an integral part of improving teacher interpersonal behaviors in the CTE learning environment. The origin of the MITB and QTI was discussed, followed by a brief explanation of how the QTI can be used. Finally, CTE was described and its benefits were discussed. Identified research suggested student perceptions of teacher interpersonal behaviors have an influence on student achievement.

Chapter 3 focuses on the methodology used in this quantitative study. The similarities and differences of Madike's (2015) study are discussed. An overview of the research design, setting and sample, instruction and materials, reliability and validity of the instrument, data collection and analysis processes, and protection of participants' rights are included.

Chapter 3: Methodology

Overview

  This quantitative study was designed to determine the relationship between student perceptions of the quality of teacher-student interactions and achievement outcomes in CTE courses. As previously stated, this study is a replication by extension of Madike's (2015) study. Madike focused on the relationship between student cognitive outcomes and the quality of teacher-student interactions among students taking introductory biology courses in a suburban community college. Both studies used the interpersonal communication and systems communication theories as part of the theoretical framework and the QTI for the instrumentation. For this study's extension, the MITB was included as part of the theoretical framework, and the research questions were revised. The quantitative survey research design and single-stage purposive sampling method used in Madike's study were used in this study; however, Madike's analyses were ultimately unable to be conducted in this study because of low participant numbers. Low participation and efforts to increase participation are described further in this chapter. Other variations to Madike's original study in terms of data collection, population, setting, and context are also described.

  The focus of this study was on student perceptions of interactions with their CTE teacher for at least a semester. Its purpose was to examine CTE student perceptions of teacher interpersonal behaviors and the effect of those behaviors on student achievement in their CTE course. The participants in this study were secondary education students (ninth through 12th graders) enrolled in CTE courses. Research indicates a decline in the quality of the teacher-student relationship when students move from elementary to

secondary education, although adolescents desire close emotional support from adults (Gehlbach et al., 2012; Niehaus et al., 2012; Raufelder et al., 2013; Rudasill et al., 2010; Zimmer-Gembeck et al., 2006). Additionally, most studies focus on teacher-student relationships in math, science, or ESL classrooms. This study will add to the literature by focusing on the teacher-student relationship in CTE classrooms. Chapter 3 discusses the research design and approach and the measures taken for the protection of participants' rights. The similarities and differences of Madike's (2015) study are also discussed.

Research Design and Approach

The research approach initially proposed for this study was a quantitative, nonexperimental, correlational design. Price et al. (n.d.) defined this design "as a type of nonexperimental research in which the researcher measures two variables and assesses the statistical relationship (i.e., the correlation) between them with very little or no effort to control extraneous variables" (p. 130). Correlational research design is useful in finding relationships among variables and describing phenomena (Price et al., n.d.). It is used when the specific relationship of interest is thought to be causal and the independent variables cannot be manipulated (Price et al., n.d.). This study was intended to determine if teacher-student interactions have a relationship with student achievement in CTE courses. Correlational research was chosen because it may show a pattern between two variables: teacher-student interaction and student achievement. Also, the statistics used in quantitative research permit inferences and evaluations to be made about the subject(s) of the study. Low participation impacted the ability to complete these statistical inferences.

Madike's (2015) study used a quantitative method with a correlational design to determine if teacher-student interaction had an impact on student achievement in

introductory biology courses. As previously stated, this replication by extension study used the research design from Madike's study. Madike used the quantitative survey approach to answer his research questions. All data collection took place at the end of a regularly scheduled class. Consent forms were administered prior to completing the survey. Madike's study was conducted in two phases:

1. Madike administered the consent forms and survey to his sample in one sitting.

2. Statistical analysis comparing the perception data to students' final self-reported grades was conducted.

The setting for Madike's (2015) study was a large suburban community college in the Mid-Atlantic. Three hundred two students (ages 19 to 45 years old) enrolled in an introductory biology course volunteered to participate in the study. All data were collected in one interval and analyzed with SPSS Statistics Version 22. Individual student perceptions of teacher interpersonal teaching behaviors and two hypothesized relationships were assessed. His main predictor variables were the teacher characteristics, as measured by the student ratings on each of the eight scales (i.e., leadership, helping/friendly, understanding, student responsibility/freedom, uncertain, dissatisfied, admonishing, and strict) of the QTI. Description statistics, nonparametric Spearman's correlation, and the Mann-Whitney U test were used to answer the research questions.

For the first research question, "How do students perceive the interpersonal behaviors of the instructors of their introductory biology courses," descriptive statistics were used to examine the means, standard deviations, minima, and maxima for the eight interpersonal behavior variables. For the second research question, "What is the

relationship between students' perceptions of interpersonal teaching behavior and student achievement in introductory biology courses," a nonparametric Spearman's correlation was used to examine the relationships between student achievement (continuous grades) and the eight interpersonal behaviors. For the third research question, "Do student perceptions of teacher interpersonal behavior differ based upon student achievement levels in introductory biology courses," the Mann-Whitney U test was used to examine differences in the eight variables based on whether students scored low or high in the course.

The results of the study indicated community college students perceived their teachers as having strong skills in leadership, understanding, and helpful/friendly domains. Based on research findings, as student grades increased, students perceived their instructors as being higher in leadership, understanding, and helpful/friendly domains. In addition, when grades increased, students perceived their teacher as being less uncertain, admonishing, dissatisfied, and strict. A significant positive correlation between grades and student perceptions of teacher leadership, understanding, and helpful/friendly subscales was determined. Student achievement was positively related to student perceptions of teacher interpersonal behavior in the introductory biology courses. Finally, high-achieving students rated their teachers' interpersonal behaviors significantly higher than low-achieving students (Madike, 2015).

As with the original study, the QTI was used to gather data on student perceptions of teachers' interpersonal behaviors in the classroom. Because of the small sample size (n=11), I was unable to complete analyses as in the original study. A frequency distribution was conducted for Research Question 1. Statistical analyses for Research

Questions 2 and 3 could not be conducted.

Setting and Sample

The setting was the Center, located in the rural southeastern United States. The Center served four high schools within the district. The schools were located within a 25-mile radius or less of the Center. Table 2 represents the demographics for each school and the Center. It includes total enrollment, gender, race, and pupils in poverty. To ensure and protect the anonymity of students who attended the Center, Table 2 does not include site names.

Table 2

Site Demographics 2020-2021

	School A	School B	School C	School D	School E
Total students	1,106	1,670	1,226	1,473	937
Females	563	813	638	714	357
%	51	49	52	48	38
Males	543	857	588	759	580
%	49	51	48	52	52
Black or African American	182	611	684	81	174
%	16	37	56	5	19
American Indian	-	5	2	6	-
%	-	.2	.2	.4	-
Asian	26	91	42	26	-
%	2	5	3	2	-
Hispanic or Latino	43	80	75	76	55
%	4	5	6	5	6
Hawaiian or Other Pacific Island	1	3	9	2	-
%	.09	.2	.7	.1	-
Two or more races	38	83	71	53	-
%	3	5	6	4	-
White	814	797	343	1,229	656
%	74	48	30	83	70
Pupils in poverty	297	641	853	203	56
%	27	38	70	14	6
Others	-	-	-	-	-
%	-	-	-	-	-

Each school's demographics are represented in Table 2. A total of 5,475 students attended the four high schools, with 937 students attending the Center. As previously shown in Table 1, 3,564 students were enrolled in CTE courses within the district, which

was 65% of the district population. Of those students in CTE courses, 763 (21%) earned

CTE completers, and 723 (20%) earned national or state credentials.

Students had the opportunity to take CTE courses, earn completers, dual credit,

and national or state credentials. Extended learning opportunities were also offered to

students. These extended learning opportunities included research and district, state, and

regional competitions. Each high school offered four schools of study. The four schools

of study offered at each school were the School of Fine Arts and Humanities; the School

of Business Management and Information Systems; the School of Engineering,

Manufacturing, and Industrial Technology (STEM); and the School of Health Science

and Human and Public Services.

It should be noted all completer programs may not have been offered at each

school in the district; however, the district offered all students the opportunity to apply to

and attend the high school that offered the CTE completer in which students were

interested. The Occupational Safety and Health Administration 10-hour online training

safety industry credential was administered to all students enrolled in completer

programs. Within each cluster, each completer also had its own industry credentials

except for the manufacturing and STEM clusters, but the STEM cluster offered the

opportunity for dual credit.

The clusters and majors were required by the South Carolina Education and

Economic Development Act of 2005. The Education and Economic Development Act

was passed in response to low graduation rates. It addressed workforce development

through student-centered education and combined high academic standards to ensure

students were better prepared to compete in an ever-changing global society. Each high

school has the same schools of study; however, clusters, majors, and completers may differ at each school. Table 3 shows the schools of study, clusters, and completer programs offered in the district.

Table 3

Schools of Study, Clusters, and Completer Programs

School of Fine Arts and Humanities	School of Business Management and Information Systems	School of Engineering, Manufacturing, and Industrial Technology	School of Health Science and Human and Public Services
Arts, Audio-Video Technology and Communication Cluster • Digital Art and Design • Media Technology and Visual Arts **Education and Training Cluster** • Early Childhood Education	**Business Management and Administration Cluster** • General Management • Operations Management **Finance Cluster** • Accounting • Business Finance **Hospitality and Tourism Cluster** • Culinary Arts and Technology **Information Technology Cluster** • Cyber Security Technology • Information Support & Services • PLTW Computer Science • Programming & Software Development **Marketing, Sales, and Service Cluster** • Marketing Management	**Agriculture, Food and Natural Resources Cluster** • Agricultural and Biosystems Engineering Technology • Environmental and Natural Resource Management • Veterinary Science and Technology **Architecture and Construction Cluster** • Building Construction Design and Integrated Technology • Electrical Design and Integrated Systems **Manufacturing Cluster** • Machine Technology and Engineering Design • Mechatronics Systems Technology • Welding Technology **Science, Technology, Engineering and Mathematics Cluster** • PLTW Engineering and Engineering Technology • SREB Clean Energy Technology **Transportation, Distribution and Logistics Cluster** • Automotive Collision Technology and Design • Automotive Service and Maintenance	**Health Science Cluster** • Health Diagnosis and Treatment • Medical Science and Research • PLTW Biomedical Sciences • Sports Medicine **Human Service Cluster** • Cosmetology • Family & Consumer Sciences **Law, Public Safety, and Security Cluster** • Emergency and Fire Management Services • Law Enforcement

Note. District's curriculum framework.

Students were offered four schools of study, 15 clusters, and 33 completers.
Completer programs were identified underneath the clusters. Each completer program
had at least two required courses. These required courses consisted of two double block
classes, considered a completer program (four credits), or two single block classes (two
credits), and two additional required electives. The district offered 137 CTE elective
courses.

At the time of the study, the Center offered 17 completer programs: eight classes
in agriculture and biosystems engineering technology, three courses in automotive
service and maintenance technology, eight courses in biomedical services and
nanotechnology, two courses in building construction design and integrated technology,
eight courses in clean energy technology, two courses in culinary arts, 10 courses in
cyber security, two courses in digital arts and design, three courses in electrical design
and integrated systems, nine courses in engineering design and technology, 10 courses in
environmental and national resources, two courses in firefighter, two courses in law
enforcement, two courses in machine technology, three courses in mechatronics systems
technology, nine courses in media technology, 10 courses in veterinary science and
technology, three courses in welding technology, and four courses in extended learning
opportunities. Course credit varied from 1 to 2 credits per course.

The Center provided students the opportunity to remain at their home school
while enrolled at the Center for their CTE study in the morning or afternoon. Twenty-
four teachers taught at the Center and 944 students (Grades 9-12) within the district
attended the Center. In the initial planning for this study, the CTE director was very
supportive, suggesting students could fill out the study survey while in class to provide

the largest possible return rate.

Prior to data collection, leadership at the site changed, and it became more difficult to collect data. The new CTE director determined that only 125 students would receive the invitation to participate in this study. According to the director, these students were randomly selected from PowerSchool. The original invitation was sent out on Tuesday, January 25, 2022. From this invitation, 12 students returned both consent and assent forms. Of those, 11 completed the survey. Efforts to increase the sample size for the study included increasing the time for the return of consent/assent forms from 2 to 12 weeks. The director was contacted six times by email and phone to request broadening the sample invited to participate. I did not receive any responses or messages from the director after January 25, 2022. The survey closed Thursday, March 25, 2022.

A sample size calculator (Qualtrics) was utilized to determine an optimal sample size of 274, at a confidence level of 95% and with a margin of error of 5% for the population size of 944. Clearly, the sample size fell well below these parameters and resulted in an inability to fully answer the research questions.

Eligibility Criteria for Participants

To be eligible for the study, participants were to be enrolled in at least one CTE course for at least 1 semester at the Center. CTE classes are full-year courses. Demographics of survey respondents were not gathered. The survey only asked for information about career clusters and cumulative GPA in the course. Based on the established criteria, participants for the study were qualified to provide their insight on the nature of interactions with their CTE teachers. No conclusions regarding similarities between the survey participants and the study population could be determined.

Instrumentation and Materials

The QTI was utilized in this study. This instrument maps the eight teaching interpersonal behaviors of teachers on the MITB (Student Questionnaire of Teacher Interaction, n.d.). The original QTI was developed in the Netherlands in the early 1980s, and it incorporated approximately 10 items in each scale, with a total of 77 items (Wubbels et al., 1993). In the late 1980s, an English language version of the QTI was developed incorporating eight items in each scale, with a total of 64 items administered (Wubbels & Levy, 1991). Later, Wubbels et al. (1993) developed a short 48-item English version of the QTI. The QTI enables secondary education students to provide feedback on teacher-student interpersonal relationships within the classroom (Wubbels et al., 1993). More than 50,000 students and teachers have used the QTI to examine teacher-student relationships in the classroom (Wubbels et al., 1997). The teacher and student classroom experiences over a relatively long period of time determine the strengths of the usefulness of the survey (Ferguson & Danielson, 2015).

According to Fisher et al. (1995), the questionnaire measures the perceptions of students of the interpersonal behaviors of the teacher. This study utilized the 48-item version on a 5-point Likert-type scale with varying options from 0 (never) to 4 (always). A Likert scale is a psychometric scale that provides respondents with multiple categories to indicate their opinions, attitudes, and feelings about a particular issue (Nemoto & Beglar, 2014). Nemoto and Beglar (2014) indicated several advantages of Likert scale questionnaires: (a) efficiency in gathering data relatively quickly from large numbers of respondents, (b) reliable person ability estimates, and (c) valid interpretations made from the data they provide can be established through a variety of means.

The items are divided into eight sectors including leadership, understanding, uncertain, admonishing, helpful/friendly, student responsibility/freedom, dissatisfied, and strict. Each sector of the QTI and the characteristics of the sectors are described as follows:

1. Leadership (Dominance-Cooperation [DC]) is described as the degree to which the teacher provides leadership to the class and holds student attention. For example, one item states, "We all listen to the teacher." Items 1, 5, 9, 13, 17, and 21 represent the leadership domain.

2. Understanding (Cooperation-Submission [CS]) is described as the teacher who shows understanding/concern/care for students. For example, one item states, "This teacher trusts us." Items 2, 6, 10, 14, 18, and 22 represent the understanding domain.

3. Uncertain (Submission-Opposition [SO]) is described as the teacher who exhibits uncertainty. For example, one item states, "Teacher doesn't seem sure." Items 3, 7, 11, 15, 19, and 23 represent the uncertain domain.

4. Admonishing (Opposition-Dominance [OD]) is described as the teacher who shows anger/impatience in class. For example, one item states, "This teacher gets angry quickly." Items 4, 8, 12, 16, 20, and 24 represent the admonishing domain.

5. Helping/Friendly (Cooperation-Dominance [CD]) is described as the teacher who is friendly and helpful toward students. For example, one item states, "This teacher is friendly." Items 25, 29, 33, 37, 41, and 45 represent the helping/friendly domain.

6. Student Responsibility/Freedom (Submission-Cooperation [SC]) is described as students being given opportunities to assume responsibility for their own activities. For example, one item states, "This teacher gives us a lot of free time in class." Items 26, 30, 34, 38, 42, and 46 represent the student responsibility/freedom domain.

7. Dissatisfied (Opposition-Submission [OS]) is described as the teacher who shows unhappiness/dissatisfaction with students. For example, one item states, "This teacher is unhappy." Items 27, 31, 35, 39, 43, and 47 represent the dissatisfied domain.

8. Strict (Dominance-Opposition [DO]) is described as the teacher who is strict and demanding of students. For example, one item states, "This teacher's test is hard." Items 28, 32, 36, 40, 44, and 48 represent the strict domain.

The strict sector may be perceived with negative behavior; however, Fisher et al. (1997) indicated that teachers with strict, leadership, and helpful/friendly behaviors had students with higher scores for cognitive outcomes. Wubbels and Levy (1989) found that leadership, helpful/friendly, and understanding were positively related to student outcomes, while uncertain, dissatisfied, and admonishing behaviors were negatively related to student outcomes.

The QTI was used without alteration and included two items asking for career cluster and cumulative GPA for the CTE course.

Validity and Reliability of Instrument

The validity of the QTI determines whether researchers can draw meaningful and useful inferences from scores on the instrument (Creswell & Creswell, 2018). A review

of the QTI confirmed the validity and reliability in all the different language versions and all levels of education (primary, secondary, and higher education; Passini et al., 2015). Several studies indicating the validity and reliability of the QTI solidified its use in this study (Fisher et al., 1997; Passini et al., 2015; Wubbels & Levy, 1989, 1991).

Wubbels and Levy (1989) indicated the Cronbach alpha reliability for each scale was greater than .70 at the student level and greater than .80 at the class level. The QTI can differentiate between the perception of students in different classrooms (Fisher et al., 1997). The QTI discriminates between classes; however, to be reliable for the class level, the QTI should be administered to at least 10 students in two different classrooms at least once per year when used for class levels. For this study, the QTI was used for the student level. Studies conducted on the validity and reliability of the QTI on the student level across multiple countries, including the U.S., were found satisfactory (Wubbels & Brekelmans, 2005). As previously stated, this instrument was found to be consistently valid and reliable in several studies; therefore, it is appropriate for this study (Fisher et al., 1997; Passini et al., 2015; Wubbels & Levy, 1989, 1991).

Data Collection and Analysis

All study materials for participants were provided to a district employee for distribution. I did not have access to participant information. An introduction letter, parent/assent forms, and the QTI were distributed through a district employee's email. The district employee sent 125 parent consent and student assent Google forms through the district email. The Google forms were collected electronically by the district employee. After the collection of all parent consent and student assent Google forms, eligible students were emailed the Google form for the QTI to complete.

Each student in the sample voluntarily chose to complete the survey, which included items about career cluster affiliation, current course average, and the 48-item QTI. Students were asked to rate each of the six items arranged corresponding to the eight sectors of the MITB using the 5-point Likert scale of 0 (never) to 4 (always) response scale. As previously stated, the eight sectors were leadership, understanding, uncertain, student responsibility/freedom, helping/friendly, dissatisfied, admonishing, and strict. Table 4 provides the alignment between the research questions, data collection, and initially proposed data analysis methods.

Table 4

Alignment of Research Questions With Data Collection Methods

Research questions	Instrument	Data collected	Method of analysis
1. How do students perceive the interpersonal behaviors of their CTE teacher?	QTI Survey Items	Quantitative	Likert Scale 0-4 Descriptive statistics and Inferences
2. What is the relationship between student perceptions of teacher interpersonal teaching behaviors and student achievement in their CTE course?	QTI Survey Items	Quantitative	Nonparametric Spearman's correlations (self-reported continuous grades and eight domains),
Null Hypothesis 2 ($H_0 2$): Student perceptions of teacher interpersonal teaching behaviors will not be related to student achievement in the CTE courses.			
Alternate Hypothesis ($H_1 2$): Student achievement will be positively related to students' perceptions of teacher interpersonal behaviors in CTE courses.			
3. Do student perceptions of teacher interpersonal behaviors differ based upon student achievement levels in the CTE course?	QTI Survey Items	Quantitative	Mann-Whitney U Test (used to determine differences in the eight dimensions based on self-reported grades),
Null Hypothesis 3 ($H_0 3$): Student perceptions of teacher interpersonal behaviors do not differ based on upon student achievement levels in CTE courses.			
Alternate Hypothesis 3 ($H_1 3$): Students achieving As and Bs will rate their teachers' interpersonal behaviors significantly more positively than students receiving grades of Cs, Ds, and Fs.			

This study utilized the QTI to gather data and data analysis plans aligned with each research question and with Madike's (2015) study. The data analysis process is discussed in the next section.

Data Analysis

Table 4 shows the data analysis plans for this quantitative study; however, these plans were not fully implemented because of the sample size (n=11). SPSS Statistics Version 26 was used to analyze the data. The research questions were designed to guide the study to test hypothesized relationships: teacher interpersonal behaviors and student achievement outcomes. To answer the first research question, "How do students perceive the interpersonal behaviors of their CTE teacher," descriptive statistics were not conducted to examine means, standard deviations, and the minima and maxima for the eight interpersonal behavior variables. Instead, descriptive statistics using frequency were deemed appropriate for this question because it provided information about the number of times a rating occurred. Therefore, it allowed me to determine the highest and lowest score for each item on the QTI.

The second research question, "What is the relationship between student perceptions of teacher interpersonal teaching behaviors and student achievement in their CTE course," included a null hypothesis, "Student perceptions of teacher interpersonal teaching behaviors will not be related to student achievement in the CTE courses," and an alternate hypothesis, "Student achievement will be positively related to student perceptions of teacher interpersonal behaviors in CTE courses." The nonparametric Spearman's rank correlation statistical tool was utilized in the original study by Madike (2015) to examine the strength of the relationship between student self-reported

cumulative average in the course and student perceptions of the eight interpersonal behaviors on the QTI. However, in this study, the sample size was not sufficient to allow for this analysis to take place.

The third research question, "Do student perceptions of teacher interpersonal behaviors differ based on student achievement levels in the CTE course," included a null hypothesis, "Student perceptions of teacher interpersonal behaviors do not differ based on upon student achievement levels in CTE courses," and an alternate hypothesis, "Students achieving As and Bs will rate their teacher's interpersonal behaviors significantly more positively than students receiving grades of Cs, Ds, and Fs." If the sample size had been larger, the Mann-Whitney U test would have been utilized as it was in Madike's (2015) study to examine the differences in the eight interpersonal behavior variables based on student grades (A-B High, C-F Low).

Teacher interpersonal behaviors are the main predictor variable measured by the QTI (Wubbels et al., 1991); therefore, the main aim of the study was to investigate the interactions between teacher and students from student perspectives. The nature of the questions helped to determine the criteria for choosing the statistical tests and data analysis for the study.

Protection of Participant Rights

Every effort to protect participant rights during all phases of the research was reflected through the research process. According to the American Educational Research Association's (2011) Code of Ethics, it is the researcher's individual responsibility to aspire to the highest possible standards of conduct in research and to take special care to protect research participants who are students. Approval to conduct this study was

granted by the IRB and the school district. I did not have access to any parent or student emails, and all communication was conducted through the CTE director and district employee.

Participation in the study was voluntary and could be terminated at any point, either by not taking the survey or exiting the survey before submission. Participants did not receive any monetary compensation or other forms of payment for their participation in the study. To maintain anonymity, there were no identifiers included on the QTI. Students were ensured in the survey that all responses were anonymous.

Cumulative results of this study were offered to the district, the Center, parents/students, participants, and the CTE business advisory board. The CTE business advisory board consisted of parents, students, teachers, community members, business and industry leaders, and higher education leaders. They met several times a year to make recommendations to improve CTE programs in the district.

Role of Researcher in Past or Current Professional Roles and Implications

At the time of the study, I served as the teacher technology leader and business teacher at my site. My past roles in the district included testing coordinator, CTE department chair, and APEX coordinator. Because I taught at one of the high schools in the district, there was a possibility that some of the student participants may have taken a CTE course with me.

Instead of collecting data from one high school, the Center was selected because students who attended the Center could come from any high school in the district.

To maintain the anonymity of the participants, identifier data such as name, grade, school, birthdate, and school identification numbers were not required on the survey.

Participants were not interviewed, and they self-reported their cumulative average for the course on the survey instrument. My role in the data collection process was limited and did not require any interaction with the participants. To ensure the accuracy of the results in the study, the precautions discussed were necessary to generate confidence in the results.

Summary

This quantitative research study was intended to examine whether a relationship existed between student perceptions of teacher interpersonal behaviors and student achievement among students enrolled in CTE courses at a rural CTE center. Chapter 3 addressed the methods and procedures used in the study and the modifications because of the small sample size. It discussed the similarities and differences between Madike's (2015) study and my study. The study sample, research design, instrumentation, data collection, and data analysis were discussed. Chapter 4 focuses on the results and reports obtainable findings.

Chapter 4: Results

Overview

The purpose of this quantitative study was to examine CTE student perceptions of teacher interpersonal behaviors and the effect of those behaviors on student achievement in their CTE course. The QTI, an instrument developed to examine teacher-student relationships, was used to collect data on student perceptions of teacher interpersonal behaviors and CTE course grades as reported by students (Wubbels et al., 1985). Due to the low sample size (11 respondents), proposed data analyses including inferential statistics were not able to be fully conducted. Instead, only descriptive statistics were used to examine the data for this study. Frequency tables were used to analyze the data. The analyses for Research Questions 2 and 3 could not be conducted because of the small sample size. Chapter 4 provides an overview of the summary of research questions and hypotheses, the research tool, the description of the sample, statistical procedures for Research Question 1, findings for Research Question 1, and the rationale for why Research Questions 2 and 3 could not be addressed.

Summary of Research Questions and Hypotheses

As a replication study by extension, the research was guided by the following research questions and hypotheses:

1. How do students perceive the interpersonal behaviors of their CTE teacher?

2. What is the relationship between student perceptions of teacher interpersonal teaching behaviors and student achievement in their CTE course?

    Null Hypothesis 2 (H_02): Student perceptions of teacher interpersonal

teaching behaviors will not be related to student achievement in CTE

courses.

Alternate Hypothesis ($H_1$2): Student achievement will be positively related

to student perceptions of teacher interpersonal behaviors in CTE courses.

3. Do student perceptions of teacher interpersonal behaviors differ based upon

student achievement levels in the CTE course?

Null Hypothesis 3 ($H_0$3): Student perceptions of teacher interpersonal

behaviors do not differ based on upon student achievement levels in CTE

courses.

Alternate Hypothesis 3 ($H_1$3): Students achieving As and Bs will rate their

teacher's interpersonal behaviors significantly more positively than

students receiving grades of Cs, Ds, and Fs.

The research questions were designed to guide the study to test two hypothesized

relationships, teacher interpersonal relationships and student achievement outcomes, and

were patterned on a previous study by Madike (2015). Each student self-reported CTE

course grades, and perceptions of teaching behaviors were measured using the QTI. As

previously stated, only descriptive analysis could be conducted for this study. The data

were analyzed using frequency tables. Frequency tables allowed the events to be counted

for each item. Research Questions 2 and 3 were not addressed due to the low sample size;

therefore, descriptive analysis addressed only Research Question 1.

Research Tool

The research tool chosen for this study was the QTI. As previously mentioned, the

QTI was specifically developed for evaluating teacher-student relationships in secondary

classrooms (Wubbels et al., 1985). This study utilized the QTI 48-item English version, without modifications, to administer to students. The QTI includes a 5-point Likert-type scale with varying options from 0 (never) to 4 (always). These items on the QTI are divided into eight sectors including leadership, understanding, uncertain, admonishing, helping/friendly, student responsibility/freedom, dissatisfied, and strict. Several previous studies determined the validity and reliability of the QTI (Fisher et al., 1997; Passini et al., 2015; Wubbels & Levy, 1989, 1991).

Characteristics of Sample

The participants for this study included ninth- through 12th-grade students who were enrolled in a CTE course at a CTE center in a rural part of a state in the southeast. Site-level leadership randomly selected 125 students of the 944 enrolled to invite to participate in the study. Data were collected after parent consent and student assent forms were obtained. Of the 125 students invited to participate, 17 parent consent forms and 12 student assent forms were collected. Of the 12 students with both consent and assent forms completed, 11 completed the full survey. Table 5 shows the career cluster for the sample.

Table 5

Sample Career Cluster

Career cluster	Frequency	%
Agriculture, Food and Natural Resources Cluster	3	27.2
Arts, Audio-Video Technology and Communication Cluster	1	9.1
Business Management and Administration Cluster	1	9.1
Health Science Cluster	1	9.1
Information Technology Cluster	2	18.1
Law, Public Safety and Security Cluster	2	18.1
Marketing, Sales and Service Cluster	1	9.1
Total	11	100

Students represented seven of 15 career clusters available at the Center. The agriculture, food, and natural resources cluster represented the largest number of students in the career cluster with three students. Next, the information technology cluster and the law, public safety, and security cluster represented the second largest number of students in the career clusters with two students each. Finally, the remaining four career clusters represented one student each.

Students self-reported their grades from PowerSchool. Table 6 shows the self-reported grades for the sample by letter grade.

Table 6

Self-Reported Grades

Grades	Frequency	%
A (100-90)	7	63.6
B (89-80)	1	9.1
C (79-70)	1	9.1
D (69-60)	1	9.1
F (59-Below)	1	9.1
Total	11	100

Based on the self-reported grades, students receiving high grades (As and Bs) included eight (72.7%) students and students receiving low grades (Cs, Ds, and Fs) included three (36.4%) students. These 11 students represented the final sample size and were used for the analysis.

Statistical Procedures

One master dataset was created as a result of the data collected from the 11 students. Descriptive statistics were conducted to address Research Question 1. Frequency tables were created for each item on the QTI using SPSS to analyze the data. Inferential statistical analyses including the nonparametric Spearman's correlations and

Mann-Whitney U test were not conducted due to the low sample size; therefore, Research Questions 2 and 3 could not be addressed in this study. Because this study was planned as a replication by extension, questions and study design were not altered despite the inability to complete the proposed analyses.

Results of Research Question 1

Descriptive statistics were performed to determine how students perceive the interpersonal behaviors of their CTE teacher. Frequency tables were created for each domain to determine the positive and negative teacher behaviors exhibited in the class. For this study, the following range was used to determine the high, mid, and low rankings of each domain: high ranking, greater than 80%; mid ranking, 60-79%; and low ranking, below 60%. This range was selected based on levels determined by Wubbels and Levy (1989). Their study determined the "best" teachers had student rankings greater than 80% on positive behaviors and less than 60% on negative behaviors. Tables 7-14 show the number of student responses for each item, percentages for each item, and overall total responses and percentages for each option of 0 (never) to 4 (always) selected. The analysis for each domain is discussed in this section.

Leadership Domain Analysis

Table 7 represents responses for Items 1, 5, 9, 13, 17, and 21. Each item represents behaviors that may or may not be exhibited in the classroom. The combined ratings of 3 and 4 together determined agreement. The highest-ranking points are greater than 80%, mid-ranking points are between 60% and 79%, and low-ranking points are below 60%. These percentages determined if students perceived their teacher leadership behaviors as being high, medium, or low in the classroom.

Table 7

Leadership Domain

Leadership items	0 (never)	1	2	3	4 (always)
1. This teacher talks enthusiastically about his/her subject.	0 -	1 (9.1%)	1 (9.1%)	1 (9.1%)	8 (72.7%)
5. This teacher explains things clearly.	1 (9.1%)	1 (9.1%)	2 (18.2%)	1 (9.1%)	6 (54.5%)
9. This teacher holds our attention.	0 -	0 -	4 (36.4%)	2 (18.2%)	5 (45.5%)
13. This teacher knows everything that goes on in the classroom.	0 -	2 (18.2%)	3 (27.3%)	1 (9.1%)	5 (45.5%)
17. This teacher is a good leader.	0 -	2 (18.2%)	3 (27.3%)	1 (9.1%)	5 (45.5%)
21. This teacher acts confidently.	0 -	0 -	1 (9.1%)	2 (18.2%)	8 (72.7%)
Total	1 (1.5%)	6 (9.0%)	14 (21.2%)	8 (12.1%)	37 (56.0%)

The highest-ranking item overall was Item 21, "This teacher acts confidently," with 90.9% of students indicating agreement with ratings of 3 or 4. Conversely, the lowest-ranking items included Item 9, "The teacher holds our attention," Item 13, "The teacher explains things clearly," and Item 17, "This teacher is a good teacher," with 54.6% of students indicating agreement with ratings of 3 or 4.

Table 7 shows one high-ranking item, Item 21; two mid-ranking items, Items 1 and 5; and three low-ranking items, Items 9, 13, and 17. Those rankings ranged from 54.6% to 90.9%. The overall total for the leadership domain was 68.1% of students indicating agreement with rankings of 3 or 4 and 31.7% of students indicating agreement with rankings of 0, 1, or 2. This overall total rating (68.1%) is a mid-range score between 60% and 79%.

Understanding Domain Analysis

Table 8 represents the understanding domain items: Items 2, 6, 10, 14, 18, and 22.

Each item represents behaviors that may or may not be exhibited in the classroom.

Table 8

Understanding Domain

Understanding items	0 (never)	1	2	3	4 (always)
2. This teacher trusts us.	2 (18.2%)	0 -	0 -	2 (18.2%)	7 (63.6%)
6. If we don't agree with this teacher, we can talk about it.	1 (9.1%)	0 -	0 -	3 (27.3%)	7 (63.6%)
10. This teacher is willing to explain things again.	2 (18.2%)	1 (9.1%)	0 -	1 (9.1%)	7 (63.6%)
14. If you have something to say, this teacher will listen.	2 (18.2%)	0 -	1 (9.1%)	2 (18.2%)	6 (54.5%)
18. This teacher realizes when we don't understand.	2 (18.2%)	0 -	2 (18.2%)	3 (27.3%)	4 (36.4%)
22. This teacher is patient.	1 (9.1%)	1 (9.1%)	1 (9.1%)	3 (27.3%)	5 (45.5%)
Total	10 (15.1%)	2 (3.0)	4 (6.0%)	14 (21.2%)	36 (54.5%)

The highest-ranking item overall was Item 6, "If we don't agree with this teacher

we can talk about it," with 90.9% of students indicating agreement with ratings of 3 or 4.

Another high-ranking item included Item 2, "This teacher trusts us," with 81.8%, of

students indicating agreement with ratings of 3 or 4. Mid-ranking items included Item 10,

"This teacher is willing to explain things again," Item 14, "If you have something to say

this teacher will listen," and Item 22, "This teacher is a patient," with 72.8%; and Item

18, "The teacher realizes when we don't understand," with 63.6% of students indicating agreement with ratings of 3 or 4. Item 18, "The teacher realizes when we don't understand," with 63.6%, was the lowest ranking for the mid-range.

Table 8 shows one high-ranking item, Item 2, and four mid-ranking items, Items 2, 10, 14, and 17. Those rankings ranged from 63.6% to 90.9%. The overall total for the understanding domain was 75.7% of students indicating agreement with ratings of 3 or 4, and 24.1% of students indicating agreement with ratings 0, 1, or 2. This overall total rating (75.7%) is a mid-range score between 60% and 79%.

Uncertain Domain Analysis

Table 9 represents the uncertain domain items, Items 3, 7, 11, 15, 19, and 23. Each item represents behaviors that may or may not be exhibited in the classroom.

Table 9

Uncertain Domain

Uncertain items	0 (never)	1	2	3	4 (always)
3. This teacher seems uncertain.	8 (72.7%)	3 (27.3%)	0 -	0 -	0 -
7. This teacher is hesitant.	8 (75.7%)	2 (18.2%)	1 (9.1%)	0 -	0 -
11: This teacher acts as if she/he does not know what to do.	9 (81.8%)	2 (18.2%)	0 -	0 -	0 -
15. This teacher let us boss her/him around.	8 (75.7%)	2 (18.2%)	1 (9.1%)	0 -	0 -
19. This teacher is not sure what to do when we fool around.	8 (72.7%)	3 (27.3%)	0 -	0 -	0 -
23. It's easy to make a fool out of this teacher.	8 (75.7%)	2 (18.2%)	1 (9.1%)	0 -	0 -
Total	49 (74.2%)	14 (21.2%)	3 (4.5%)	0 -	0 -

The lowest-ranking items included Items 3, 7, 11, 15, 19, and 23, with 0% of students indicating agreement with rankings of 3 or 4. Item 3, "This teacher seems uncertain," Item 7, "This teacher is hesitant," Item 11, "This teacher acts as if she/he does not know what to do," Item 15, "This teacher let us boss her/him around," Item 19, "This teacher is not sure what to do when we fool around," and Item 23, "It's easy to make a fool out of this teacher students," indicated 100% agreement with rankings of 0, 1, or 2 for the uncertain domain.

Admonishing Domain Analysis

Table 10 represents the admonishing domain items, Items 4, 8, 12, 16, 20, and 24.

Each item represents admonishing behaviors that may or may not be exhibited in the classroom.

Table 10

Admonishing Domain

Admonishing items	0 (never)	1	2	3	4 (always)
4. This teacher gets angry unexpectedly.	8 (72.7%)	0 -	0 -	1 (9.1%)	2 (18.2%)
8. This teacher gets angry quickly.	8 (75.7%)	0 -	1 (9.1%)	1 (9.1%)	1 (9.1%)
12. This teacher is too quick to correct us when we break a rule.	6 (54.5%)	1 (9.1%)	1 (9.1%)	2 (18.2%)	1 (9.1%)
16. This teacher is too quick to correct us when we break a rule.	8 (72.7%)	1 (9.1%)	0 -	0 -	2 (18.2%)
20. It is easy to pick a fight with this teacher.	7 (63.6%)	2 (18.2%)	0 -	1 (9.1%)	1 (9.1%)
24. The teacher is sarcastic.	6 (54.5%)	4 (36.4%)	0 -	0 -	1 (9.1%)
Total	43 (65.2%)	8 (12.1%)	2 (3%)	5 (7.6%)	8 (12.1%)

The lowest-ranking item overall was Item 24, "This teacher is sarcastic," with 9.1% of students indicating agreement with rankings of 3 or 4. Other low-ranking items included Item 8, "This teacher gets angry quickly," Item 16, "This teacher is impatient," and Item 20, "It is easy to pick a fight with this teacher," with 18.2%; Item 4, "This teacher gets angry unexpectedly," and Item 12, "This teacher is too quick to correct us when we break a rule," with 27.3% of students indicating agreement with rankings of 3 or 4. Item 4, "This teacher gets angry unexpectedly," and Item 12, "This teacher is too

quick to correct us when we break a rule," with 27.3%, were the highest-ranking items for this domain.

Table 10 shows all items as low-ranking. Those rankings ranged from 9.1% to 27.3%. The overall total was 19.7% of students indicating agreement with rankings of 3 or 4, and 80.3% of students indicating agreement with rankings of 0, 1, or 2. This overall total rating (19.7%) is in the low point range of less than 60%. Once again, this domain is considered negative, so a low point range is a positive indicator.

Helping/Friendly Domain Analysis

Table 11 represents the helpful/friendly domain items, Items 5, 9, 13, 17, 21, and 25. Each item represents helpful/friendly behaviors that may or may not be exhibited in the classroom.

Table 11

Helpful/Friendly Domain

Helpful/friendly items	0 (never)	1	2	3	4 (always)
25. This teacher helps with our work.	1 (9.1%)	2 (18.2%)	0 -	1 (9.1%)	7 (63.6%)
29. This teacher is friendly.	0 -	0 -	2 (18.2%)	2 (18.2%)	7 (63.6%)
33. This teacher is someone we can depend on.	2 (18.2%)	0 -	1 (9.1%)	1 (9.1%)	7 (63.6%)
37. This teacher has a sense of humor.	1 (9.1%)	0 -	1 (9.1%)	5 (45.4%)	4 (36.4%)
41. This teacher can take a joke.	1 (9.1%)	0 -	1 (9.1%)	3 (27.3%)	6 (54.5%)
45. This teacher's class is pleasant.	1 (9.1%)	0 -	1 (9.1%)	2 (18.2%)	7 (63.6%)
Total	6 (9.0%)	2 (3.0%)	6 (9.0%)	14 (21.2%)	38 (57.6%)

The highest-ranking items overall were Item 29, "This teacher is friendly," Item 37, "This teacher has a sense of humor," Item 41, "This teacher can take a joke," and Item 45, "This teacher's class is pleasant," with 81.8% of students indicating agreement with rankings of 3 or 4. Mid-ranking items included Item 25, "This teacher helps with our work," and Item 33, "This teacher is someone we can depend on," with 72.7% of students indicating agreement with rankings of 3 or 4. The low-range rankings for this domain included Items 25 and 33.

Table 11 shows four highest-ranking items, Items 29, 37, 41, and 45, and two mid-ranking items, Items 25 and 33. The rankings ranged from 72.7% to 81.8%. The

overall total was 78.8% of students indicating agreement with rankings of 3 or 4 and

21.2% of students indicating agreement with rankings of 0, 1, or 2. This overall total

rating (78.8%) is a mid-range score between 60% and 79%.

Student Responsibility/Freedom Domain Analysis

Table 12 represents the student responsibility/freedom domain items, Items 26,

30, 34, 38, 42, and 46. Each item represents student responsibility/freedom behaviors that

may or may not be exhibited in the classroom.

Table 12

Student Responsibility/Freedom Domain

Student responsibility/freedom items	0 (never)	1	2	3	4 (always)
26. We can decide some things in this teacher's class.	1 (9.1%)	0 -	3 (27.3%)	2 (18.2%)	5 (45.5%)
30. We can influence this teacher.	0 -	4 (36.4%)	2 (18.2%)	3 (27.3%)	2 (18.2%)
34. This teacher lets us fool around in class.	3 (27.3%)	2 (18.2%)	1 (9.1%)	4 (36.4%)	1 (9.1%)
38. This teacher lets us get away with a lot in class.	5 (45.5%)	1 (9.1%)	2 (18.2%)	3 (26.3%)	0 -
42. This teacher gives us a lot of free time in class.	3 (27.3%)	1 (9.1%)	2 (18.2%)	3 (27.3%)	2 (18.2%)
46. This teacher is lenient.	1 (9.1%)	1 (9.1%)	3 (27.3%)	3 (27.3%)	3 (27.3%)
Total	13 (19.6%)	9 (13.6%)	13 (19.6%)	18 (27.2%)	13 (19.6%)

The mid-ranking item overall was Item 26, "We can decide some things in this

teacher's class," with 63.7% of students indicating agreement with rankings of 3 or 4.

Conversely, the low-ranking items included Item 30, "We can influence this teacher,"
Item 34, "This teacher lets us fool around in class," and Item 42, "This teacher gives us a
lot of free time in class," with 45.5%; Item 38, "This teacher lets us get away with a lot in
class," with 26.3%; and Item 46, "This teacher is lenient," with 54.6% of students
indicating agreement with rankings of 3 of 4. The highest-ranking item was Item 26, and
the lowest-ranking item was Item 38.

Table 12 shows one mid-ranking item, Item 26, and five low-ranking items, Items
30, 34, 38, 42, and 46. Those rankings ranged from 26.3% to 63.7%. The overall total
was 46.8% of students indicating agreement with rankings of 3 or 4 and 52.8% of
students indicating agreement with rankings of 0, 1, and 3. This overall total rating
(46.8%) is a low-range score of less than 60%.

Dissatisfied Domain Analysis

Table 13 represents the dissatisfied domain items, Items 27, 31, 35, 39, 43, and
47. Each item represents dissatisfied behaviors that may or may not be exhibited in the
classroom.

Table 13

Dissatisfied Domain

Dissatisfied items	0 (never)	1	2	3	4 (always)
27. This teacher thinks we cheat.	7 (63.6%)	3 (27.3%)	1 (9.1%)	0 -	0 -
31. This teacher thinks we don't know anything.	9 (81.8%)	1 (9.1%)	0 -	0 -	1 (9.1%)
35. This teacher puts us down.	9 (81.8%)	1 (9.1%)	1 (9.1%)	0 -	0 -
39. This teacher thinks that we can't do things well.	9 (81.8%)	1 (9.1%)	1 (9.1%)	0 -	0 -
43. This teacher seems dissatisfied.	9 (81.8%)	1 (9.1%)	0 -	0 -	1 (9.1%)
47. This teacher is suspicious.	7 (63.6%)	3 (27.3%)	0 -	0 -	1 (9.1%)
Total	50 (75.7%)	10 (15.1%)	3 (4.5%)	0 -	3 (4.5%)

The lowest-ranking items overall were Item 27, "This teacher thinks we cheat," Item 35, "This teacher puts us down," and Item 39, "This teacher thinks that we can't do things well," with 0% students indicating agreement with rankings of 3 or 4. Item 31, "This teacher thinks we don't know anything," Item 43, "This teacher seems dissatisfied," and Item 47, "This teacher is suspicious," with 9.1% of students indicating agreement with rankings of 3 or 4 were the highest ranking items.

Table 13 shows all Items 27, 31, 35, 39, 43, and 47 were low-ranking. Those rankings ranged from 0% to 9.1%. The overall total for the dissatisfied domain was 4.5% of students indicating agreement with rankings of 3 or 4 and 95.3% of students indicating agreement with rankings of 0, 1, and 2. This overall total rating (4.5%) is a low-range

score of less than 60%. This is a low ranking on a negative domain and thus a positive

outcome.

Strict Domain Analysis

Table 14 represents the strict domain items, Items 28, 32, 36, 40, 44, and 48. Each

item represents strict behaviors that may or may not be exhibited in the classroom.

Table 14

Strict Domain

Strict items	0 (never)	1	2	3	4 (always)
28. This is a strict teacher.	6 (54.5%)	3 (27.3%)	1 (9.1%)	0 -	1 (9.1%)
32. We have to be silent in this teacher's class.	8 (72.7%)	1 (9.1%)	1 (9.1%)	0 -	1 (9.1%)
36. The teacher's tests are hard.	6 (54.5%)	2 (18.2%)	2 (18.2%)	0 -	1 (9.1%)
40. This teacher's standards are very high.	2 (18.2%)	1 (9.1%)	2 (18.2%)	4 (36.6%)	2 (18.2%)
44: This teacher is severe when marking papers.	7 (63.6%)	2 (18.2%)	2 (18.2%)	0 -	0 -
48. We are afraid of this teacher.	10 (90.9%)	0 -	0 -	0 -	1 (9.1%)
Total	39 (59.0%)	9 (13.6%)	8 (12.1%)	4 (6.0%)	6 (9.1%)

The lowest-ranking item overall was Item 44, "This teacher is severe when

marking papers when marking papers," with 0% of students indicating agreement with

rankings of 3 or 4. Item 40, "This teacher's standards are very high," with 54. 8% of

students indicating agreement with rankings of 3 or 4 was the highest ranking. Table 14

shows the lowest-ranking items were Items 28, 32, 36, 44, and 48. Those rankings ranged from 0% to 9.1%. The overall total for the strict domain was 15.1% of students indicating agreement with rankings of 3 or 4 and 84.7% of students indicating agreement with rankings of 0, 1, and 2. This overall total rating (15.1%) is a low-range score of less than 60%. This is a low rating on the strict domain; however, this does not mean strict is negative.

Domain Overall Results and Mean Scores

A summary of the overall totals and percentages for each option of 0 (never) to 4 (always) is shown in Table 15. Each domain represents a behavior that may or may not be exhibited in the classroom. Primarily, in Chapter 4, I discussed frequency distribution, but mean scores are included in order to compare findings to Madike (2015). The overall totals, percentages of each item, and high mean scores will provide meaning to how students perceived their teacher in the classroom. Each domain used an established range for each QTI item: domains with greater than 80% agreement (scoring 3 or 4) were determined as high ranking; domains with 60% to 79% agreement were determined as mid-ranking; and domains with agreement below 60% were determined as low-ranking.

Table 15

Domain Results and Mean Scores

Domain	0 (never)	1	2	3	4 (always)	Agreements %	M
Leadership	1 (1.5%)	6 (9.1%)	14 (21.2%)	8 (12.1%)	37 (56.1%)	68.2*	3.12
Understanding	10 (15.1%)	2 (3.0)	4 (6.0%)	14 (21.2%)	36 (54.5%)	75.7*	2.97
Uncertain	49 (74.2%)	14 (21.2%)	3 (4.5%)	0 -	0 -	0 -	.30
Admonishing	43 (65.2%)	8 (12.1%)	2 (3.0%)	5 (7.6%)	8 (12.1%)	19.7	.89
Helpful/Friendly	6 (9.1%)	2 (3.0%)	6 (9.0%)	14 (21.2%)	38 (57.5%)	78.8*	3.15
Student responsibility/ friendly	13 (19.6%)	9 (13.6%)	13 (19.6%)	18 (27.2%)	13 (19.6%)	47.0	2.14
Dissatisfied	50 (75.8%)	10 (15.2%)	3 (4.5%)	0 -	3 (4.5%)	4.5	.42
Strict	39 (60.0%)	9 (13.6 %)	8 (12.1%)	4 (6.1%)	6 (9.1%)	15.2	.86

Note. M=mean score for this study. *Three highest mean scores for this study.

In the review, the overall results and mean scores of the student responses ranged from 0 (never) to 4 (always) across domains. No domains were determined as high ranking with greater than 80% agreement (scores of 3 or 4). Mid-ranking domains (agreement percentages between 60% and 79%) included leadership (68.2%, M=3.12), understanding (75.7%, M=2.97), and helpful/friendly (78.8% M=3.15). Leadership, understanding, and helpful/friendly domains have been associated with higher student outcomes (Madike, 2015; Wubbels & Brekelmans, 2005; Wubbels & Levy, 1989). Those domains have been associated with positive teaching behaviors. Low-ranking domains

(agreement percentages at 59% or below) included uncertain (0%, M=.30), admonishing (19.7%, M=.89), student responsibility/freedom (47.0%, M=2.14), dissatisfied (4.5%, M=.42), and strict (15.2%, M=.86). Uncertain, admonishing, student responsibility/ freedom, and dissatisfied domains have been associated with lower student outcomes (Madike, 2015; Wubbels & Brekelmans, 2005; Wubbels & Levy, 1989). Those domains have been associated with negative teaching behavior results; however, some research has shown that student responsibility/freedom and strict domains have been associated with having positive cognitive outcomes (Passini et al., 2015; Wubbels et al., 1991). Based on the literature review, when student responsibility/freedom and strict domains are paired with domains high in cooperation and dominance or high cooperation and submissive, this may lead to positive student outcomes; therefore, the findings are inconclusive as it relates to the student responsibility/freedom and strict domains.

Of all the domains, helpful/friendly (78.8%, M=3.15) ranked highest in terms of agreement percentage and mean. Uncertain was the lowest scoring (0%, M=.30). Students rated their teacher higher for the positive domains: leadership, understanding, and helpful/friendly; and lower on the negative domains: uncertain, admonishing, student responsibility/freedom, dissatisfied, and strict. Each domain is represented on the MITB. The closer the domains are placed on the model, the more they are similar in behaviors (Fisher et al., 1997; Wubbels & Levy, 1989). The domains are labeled based on their position in the coordinate system. Figure 2 shows each domain on the MITB, its location on the axis, and the typical behaviors associated with each domain.

Based on the results, the highest-ranking domain helpful/friendly (78.7%) is plotted between the cooperation and dominance (CD) axes. This shows helpful/friendly

CTE teachers exhibited more cooperation and less dominant behaviors. The leadership domain (68.2%) is plotted between the dominance and cooperation axes. CTE teachers exhibit slightly greater cooperation and less dominance. The understanding domain (75.7%) is plotted between the cooperation and submission axes. This shows understanding (CS) CTE teachers exhibited more cooperation and less submission; however, understanding CTE teachers are more submissive than helpful/friendly and leader CTE teachers. Helpful/friendly, leader, and understanding CTE teachers exhibited more cooperation than dominance and submission.

Low-ranking domains included student responsibility/freedom domain (47.0%), uncertain (0%), dissatisfied (4.5%), admonishing (19.7%), and strict (15.2%). Those domains are plotted between the submission and opposition (SC, OS) and opposition and dominance (OD, DO) axes, except student responsibility/freedom (SC) is plotted between submission and cooperation. According to the results, the student responsibility/freedom revealed CTE teachers exhibited slightly more submission than cooperation. Uncertain and dissatisfied are plotted between submission and opposition. CTE teachers exhibited very low uncertain (SO) and dissatisfied (OS) submission and opposition. The admonishing (OD) and strict (DO) domains are plotted between opposition and dominance. CTE teachers exhibited low opposition and dominance based on the results.

Overall, the results revealed CTE teachers exhibited more cooperation and low dominance, submission, and opposition. Helpful/friendly, leader, and understanding CTE teachers exhibited more cooperation and less student responsibility/freedom, uncertain, dissatisfied, admonishing, and strict behaviors.

Results for Research Question 2

The second research question proposed examining the relationship between student perceptions of teacher interpersonal teaching behaviors and student achievement in their CTE course. Both Madike's (2015) original study and this study proposed the use of nonparametric Spearman's correlation to examine the data. This analysis could not be conducted to examine the relationships between CTE student achievement (continuous grades) and the eight domains of interpersonal behaviors in this study because of the small sample size (11). Results would not be significant; therefore, further discussion and recommendations will be discussed in Chapter 5.

Results for Research Question 3

The third research question proposed determining whether student perceptions of their teacher's interpersonal behaviors differed based upon self-reported student achievement levels in their CTE course. Madike's (2015) analysis was proposed for this replication study in the form of a nonparametric Mann-Whitney U test; however, this analysis could not be conducted to address Research Question 3 because of the small sample size (11). Further discussion and recommendations will be discussed in Chapter 5.

Summary

Chapter 4 provided an overview of the summary of research questions and hypotheses, the research tool, and a description of the sample; presented the statistical procedure for Research Question 1; reported the findings of Research Question 1; and provided a rationale for why Research Questions 2 and 3 could not be addressed. As previously stated, the purpose of this correlational quantitative study was to determine whether relationships existed between student grades and their perceptions of teacher

interpersonal behaviors. Data were collected according to district guidelines and analyzed with descriptive statistics. Descriptive statistics were conducted to address Research Question 1. In addition, frequency tables for each item on the QTI and a summary table with the mean score were created. The results were discussed for each item as it related to each domain: leadership, understanding, uncertain, admonishing, helpful/friendly, student responsibility, dissatisfied, and strict. The analysis for Research Questions 2 and 3 could not be conducted because of the low sample size (11). Results would not be significant; therefore, further discussion and recommendations are discussed in Chapter 5.

Chapter 5 presents the discussions, recommendations, and conclusions for the study. It presents a detailed interpretation of findings and discusses implications for social change, recommendations for action, and recommendations for further research.

Chapter 5: Discussion

Overview

The intended purpose of this study was to provide insight into CTE student perceptions of teacher interpersonal behaviors and student achievement in CTE classes; however, the scope of the study was limited because of the sample size. Inadequate research exists around CTE teacher-student relationships; however, many studies have been conducted in other academic areas that support the benefit of a positive teacher relationship in the classroom (Brekelmans et al., 2002; Passini et al., 2015). According to U.S. Department of Education (2020), CTE programs struggle with retaining students to earn concentrators and/or completers. Today's jobs require specific skill sets and certifications to meet employer needs. Studies have shown that CTE students who have specific skills are better prepared for the labor force after high school and earn higher wages than those who did not participate in CTE (Meer, 2007; Smalley & Sands, 2018; Stern et al., 2010; Symonds et al., 2011). Student achievement may be impacted by many different factors that may or may not be in the control of the teacher; however, that makes it even more important to gain a better understanding of the dynamics of teacher-student relationships and how they impact student achievement.

This quantitative study was intended to examine student perceptions of teacher interpersonal behaviors and the impact on their student achievement by replicating Madike's (2015) study. Interpersonal communication, systems communication, and the MITB served as the theoretical framework. Wubbels et al.'s (1985) 48-item QTI was administered to students enrolled in CTE courses. The research questions addressed how students perceived the behaviors of their CTE teachers and how the teacher behaviors

impacted student achievement. Descriptive statistics revealed how students perceived interpersonal teaching behaviors; however, inferential statistical analyses including the nonparametric Spearman's correlation and Mann-Whitney U test were not conducted due to low sample size. Therefore, only Research Question 1 was addressed. Research Questions 2 and 3, based on Madike's original study, could not be addressed in this study.

To answer the first research question, "How do students perceive the interpersonal behaviors of their CTE teacher," descriptive statistics using frequency distributions were deemed appropriate for this question because they provided information about the number of times a behavior occurred. Using frequency distributions allowed me to determine the high, middle, and low points for each item on the QTI using ranges established by Wubbels and Levy (1989). The overall totals and percentages and the mean scores were also calculated. The second research question, "What is the relationship between student perceptions of teacher interpersonal teaching behaviors and student achievement in their CTE course," included a null hypothesis, "Student perceptions of teacher interpersonal teaching behaviors will not be related to student achievement in the CTE courses," and an alternate hypothesis, "Student achievement will be positively related to student perceptions of teacher interpersonal behaviors in CTE courses." The nonparametric Spearman's rank correlation statistical tool was utilized in the original study by Madike (2015) to examine the strength of the relationship between student self-reported class average and student perceptions of the eight interpersonal behaviors on the QTI; however, in this study, the sample size was not sufficient to allow for this analysis to take place.

The third research question, "Do student perceptions of teacher interpersonal behaviors differ based on student achievement levels in the CTE course," included a null hypothesis, "Student perceptions of teacher interpersonal behaviors do not differ based on upon student achievement levels in CTE courses," and an alternate hypothesis, "Students achieving As and Bs will rate their teacher's interpersonal behaviors significantly more positively that students receiving grades of Cs, Ds, and Fs." If the sample size had been larger, the Mann-Whitney U test would have been utilized, as it was in Madike's (2015) study, to examine the differences in the eight interpersonal behavior domains based on student grades (A-B High, C-F Low). Because this study was planned as a replication by extension, questions and study design were not altered as a result of an inability to complete the proposed analyses.

Summary and Interpretation of Findings

Research Question 1

The first research question examined student perceptions of their CTE teachers along with behavior domains identified by Wubbels et al. (1985). These domains included the following eight categories: leadership, understanding, uncertain, admonishing, helpful/friendly, student responsibility/freedom, dissatisfied, and strict.

The findings for Research Question 1 revealed how students perceived the interpersonal teaching behaviors of their teacher. Student rankings were considered in agreement with items when scored as either 3 or 4 on the 0-4 Likert scale. Agreement percentages higher than 80% were considered high range; agreement percentages ranging from 60% to 79% were considered mid-range; and agreement percentages lower than 60% were considered low range (Wubbels & Levy, 1989). No domains were identified as

high ranking as none were above 80%. The highest-ranking positive domain was helpful/friendly (78.7%), and the lowest-ranking domain was uncertain (0%). These domains were positively related to how students perceived their CTE teacher's interpersonal teaching behaviors in the classroom. Conversely, the lowest-ranking domains (uncertain, admonishing, student responsibility/freedom, dissatisfied, and strict) were rated as low (< 60%). The low-ranking domains ranged from 0% to 47.0%, and mean scores ranged from M=.30 to M=2.14. The percentage overall ranking of 0% was the lowest score for the negative domains. Table 15 provides a summary of the domain results and mean scores for this study as compared to Madike's (2015).

The overall results revealed the helpful/friendly domain (78.7%, M=3.12) was the highest mid-score and mean, and the lowest score was the uncertain domain (0%, M=.30). Leadership, understanding, helpful/friendly, and student responsibility/freedom domains mean scores were higher than Madike's (2015). CTE students rated their teachers higher on leadership, understanding, and helpful/friendly and lower on admonishing, dissatisfied, and strict. My findings were similar to Madike's in that CTE and biology teachers exhibited leadership, helpful/friendly, and understanding behaviors. Both CTE and biology teachers exhibited low uncertain, admonishing, student responsibility/freedom, dissatisfied, and strict behaviors; however, biology teachers exhibited less student responsibility/freedom and more strict behaviors than CTE teachers. A specific comparison of mean scores and ranking of domains are discussed further in the chapter.

In summary, Madike's (2015) study and my study had similarities and differences. The rankings of the domains and mean scores differed. Leadership,

understanding, and helpful/friendly ranked the highest for each study, but the order of the rankings and mean scores differed. Student responsibility/freedom ranked higher and strict ranked lower for CTE teachers.

Positive Behavior Domains. Both Madike's (2015) study and my study concluded the participants perceived their teachers as having strong leadership, helpful/friendly, and understanding behaviors. According to the QTI, leaders are described as those teachers who are enthusiastic, explain things clearly, hold students' attention, are aware of what goes on, and act confidently. Madike's study and other studies show students perceiving their teachers with strong leadership skills is associated with higher student outcomes (Madike, 2015; Wubbels & Levy, 1989). Although Madike used descriptive statistics to examine the means, standard deviations, minima, and maxima, in Chapter 4, the mean score was calculated in my study to conduct a comparative study. Madike did not establish parameters for what was considered high mean scores, but his high mean scores were between M=2.76 and 2.88. Madike's highest mean score was the leadership domain, M=2.88. Conversely, the mean score for the leadership domain in my study was higher at M=3.12 with a .24 difference. Madike concluded the community college students perceived their teachers as having strong leadership behaviors. The 11 respondents perceived their CTE teacher as exhibiting leadership behaviors in the classroom. In this study, CTE teachers exhibited higher leadership behaviors than biology teachers.

Biology and CTE participants perceived their teacher as being understanding in Madike's (2015) study and my study. The understanding behavior is described as trusting, compromising, flexibility, listening, intuitiveness, and patience. The participant

mean score in Madike's study for the understanding domain mean was M=2.93; the mean score in my study was M=2.97 with a .04 difference. These results were almost equal. Madike concluded the community college students perceived their introductory biology teachers as having strong understanding behaviors. My findings were consistent with Madike's study on how students perceived their teacher's understanding behaviors. The 11 respondents perceived their teacher as exhibiting understanding behaviors in the classroom. Based on the participant responses, biology and CTE teachers exhibited understanding behaviors to a similar degree. The understanding domain was the highest mean in Madike's study.

The helpful/friendly domain was my study's highest rating (78.7%). Madike's (2015) study and my study revealed participants perceived their teacher as being helpful/friendly. Helpful/friendly behavior is described as being helpful, friendly, dependable, and having a sense of humor. The participant mean score in Madike's study for the helpful/friendly domain mean was M=2.76; the mean score for my study was M=3.15 with a .39 difference. This mean score was higher than Madike's findings; however, Madike concluded the community college students perceived their introductory biology teachers as exhibiting helpful/friendly behaviors. Based on my findings, the 11 respondents perceived their teacher as exhibiting helpful/friendly behaviors in the classroom.

Based on the mean scores, the 11 respondents and the community college biology students perceived their teachers as exhibiting leadership, understanding, and helpful/friendly behaviors. The mean scores would imply the respondents and community college students regularly perceive their teacher as enthusiastic, trusting, flexible,

friendly, and dependable in the classroom. Those behaviors are seen as being positively related to the teacher behaviors in the classroom. Conversely, the negative domains interaction in the classroom included uncertain, admonishing, student responsibility/ freedom, dissatisfied, and strict domains. These domains are discussed below.

Negative Behavior Domains. Madike's (2015) study and my study concluded participants perceived their teacher as exhibiting low uncertain, student responsibility/freedom, admonishing, dissatisfied, and strict behaviors. These behaviors are described as hesitant, lack confidence, bossy, lack decision-making, and pushover. The participants in both studies rated these domains in the low range. For example, the mean score in Madike's study for the uncertain domain was M=.69; the mean score in my study was M=.30 with a .39 difference. The mean score for the uncertain domain was higher in Madike's study. Madike concluded the community college students perceived their introductory biology teachers as exhibiting low uncertain behaviors. Based on my findings, the 11 respondents perceived their teacher as exhibiting low uncertain behaviors. Biology teachers exhibited higher uncertain behaviors than CTE teachers in my study.

Biology and CTE participants perceived their teacher as exhibiting low admonishing behaviors. Admonishing behavior is described as displaying anger, impatience, sarcasm, and easy to pick a fight. The participant score in Madike's (2015) study for the admonishing domain mean was M=.76; the mean score in my study was M=.89 with a .13 difference. The mean score for the admonishing domain was slightly higher in my study. Madike concluded the community college students perceived their introductory biology teachers as exhibiting low admonishing behaviors. Based on my

findings, the 11 respondents perceived their teacher as exhibiting low admonishing behavior. In my study, CTE teachers exhibited higher admonishing behaviors than biology teachers.

The student responsibility/freedom domain results revealed participants in Madike's (2015) study and my study exhibited low student responsibility/freedom. This domain focuses on the freedom the teacher provides the student in the classroom; for example, allowing students to decide some things, allowing the student to influence the teachers, allowing students to get away with a lot and fool around, giving a lot of free time, and being lenient. The participant scores in Madike's study on the student responsibility/freedom domain mean was M=1.17; the mean score for my study was M=2.14 with a .97 difference. This mean score (2.14) was the highest mean score for the negative domains in my study. Madike concluded the community college students perceived their introductory biology teachers as exhibiting low student responsibility/ freedom behaviors. Based on my findings, 11 respondents perceived their teacher as exhibiting low student responsibility/freedom behaviors. CTE teachers exhibited higher student responsibility/freedom behaviors than biology teachers. The difference between the mean scores was the second largest (.97) for all the domains; the largest difference is the strict domain (1.04). Research has shown that high student responsibility/freedom behaviors has been associated with positive outcomes (Passini et al., 2015).

Participants from both studies revealed they perceived their teacher as exhibiting low dissatisfied behaviors. Dissatisfied behavior is described as the teacher putting the student down, being suspicious, and thinking the student cheats. The participant scores in Madike's (2015) study on the dissatisfied domain mean was M=.82; the mean score for

my study was M=.42 with a .40 difference. The mean score for the dissatisfied domain was lower in my study. Madike concluded the community college students perceived their introductory biology teachers as exhibiting low dissatisfied behaviors. Biology teachers exhibited higher dissatisfied behaviors than CTE teachers. Based on my findings, 11 respondents perceived their teacher as exhibiting low dissatisfied behaviors.

The strict domain results revealed in Madike's (2015) study and my study show both biology and CTE students perceived their teacher as exhibiting low strict behaviors. Strict behavior is described as the teacher giving hard tests, making students be silent, setting high standards, and fearing the teacher. The participant scores in Madike's study on the strict domain mean was M=1.90; the mean score for my study was M=.86 with a 1.04 difference. This difference was the largest for all the domains. The community college students perceived their introductory biology teachers as exhibiting more strict behaviors than CTE teachers (Madike, 2015). Based on my findings, 11 respondents perceived their teacher as exhibiting low strict behaviors. Biology teachers exhibited higher strict behavior than CTE teachers. Research has shown that highly strict behaviors has been associated with positive outcomes when paired with domains high in cooperation (Fraser et al., 2010; Wubbels & Brekelmans, 2005).

Based on the mean scores, 11 respondents and the community college biology students perceived their teacher as seldom exhibiting uncertain, admonishing, student responsibility/freedom, dissatisfied, and strict behaviors The mean scores would imply that 11 respondents and community college students seldom perceive their teacher as being uncooperative or oppositional, angry, or critical. These behaviors are negatively related to the teacher behavior in the classroom, according to Madike (2015). Table 16

shows a side-by-side comparison of how my findings ranked from most to least with

Madike's findings.

Table 16

Most to Least Domain Comparison With Means

Madike's study	M	This study	M
Understanding (CS)	2.93	Helpful/friendly (CD)	3.15
Leadership (DC)	2.88	Leadership (DC)	3.12
Helpful/Friendly (CD)	2.76	Understanding (CS)	2.97
Strict (DO)	1.90	Student Responsibility/Freedom (SC)	2.14
Student Responsibility/Freedom (SC)	1.17	Admonishing (OD)	.89
Dissatisfied (OS)	.82	Strict (DO)	.86
Admonishing (OD)	.76	Dissatisfied (OS)	.42
Uncertain (SO)	.69	Uncertain (SO)	.30

Note. M=mean for both studies.

This comparison table, Table 16, compared the domain rankings and mean scores.

The domains with the highest mean scores included leadership, understanding, and

helpful/friendly. Biology teachers' ranking included understanding, leadership, and

helpful/friendly. Those mean scores were lower than CTE teachers. Conversely, CTE

teachers' ranking for helpful/friendly, leadership, and understanding had higher mean

scores than biology teachers. The highest mean difference was the helpful/friendly

domain (.39), and the lowest mean difference was the understanding domain (.04). Based

on the mean scores, biology teachers and CTE teachers exhibit cooperation, but CTE

teachers exhibit more cooperation than biology teachers.

The lowest ranking mean scores included student responsibility/freedom,

uncertain, dissatisfied, admonishing, and strict. Biology teachers' ranking included strict,

student responsibility/freedom, dissatisfied, and uncertain. CTE teachers' ranking

included student responsibility/freedom, admonishing, strict, dissatisfied, and uncertain.

The largest mean difference was the student responsibility/freedom (.97) and strict (1.04)

domains. Biology teachers exhibited higher strict behaviors than CTE teachers, and CTE teachers exhibited higher student responsibility/freedom behaviors.

In summary, the positive domains of leadership, understanding, and helpful/friendly were rated positively by the 11 respondents. Comparatively, the results of the positive domains and negative domains were consistent with other studies that have been conducted (Fraser et al. 2010; Madike, 2015; Wubbels & Levy, 1989). However, student responsibility/freedom and strict domains were found to be inconclusive because they have been associated with positive and negative impacts on student outcomes. Table 17 compares the results from Fraser et al.'s (2010) study to Madike's (2015) study and my study.

Table 17

Study Comparison Ranking Order

Fraser et al. (2010)	M	Madike (2015)	M	This Study	M
Understanding (CS)	3.42	Understanding (CS)	2.93	Helpful/Friendly (CD)	3.15
Leadership (DC)	3.02	Leadership (DC)	2.88	Leadership (DC)	3.12
Strict (DO)	2.99	Helpful/Friendly (CD)	2.76	Understanding (CS)	2.97
Helpful/Friendly (CD)	2.91	Strict (DO)	1.90	Student responsibility/ freedom (CS)	2.14
Student responsibility/freedom (CS)	2.16	Student responsibility/ freedom (CS)	1.17	Admonishing (OD)	.89
Dissatisfied (SO)	2.12	Dissatisfied (SO)	.82	Strict (DO)	.86
Uncertain (OS)	2.08	Admonishing (OD)	.76	Dissatisfied (SO)	.42
Admonishing (OD)	1.91	Uncertain (OS)	.69	Uncertain (OS)	.30

Note. M=Mean score for each study.

The comparison with Fraser et al. (2010) revealed similarities and differences to Madike's (2015) study and my study. Fraser et al. administered the QTI to 114 students enrolled in management classes at a university, and Madike's study administered the QTI

to 314 students in a similar setting. Table 17 shows participants in the Fraser et al. and Madike's studies revealed understanding was the highest-ranking domain for each study, but the mean scores differed. For example, Fraser et al.'s highest mean score was the understanding domain, M=3.42, and Madike's highest mean score was the understanding domain, M=2.93; however, my study understanding domain was higher than Madike's, M=2.97, with a .04-point difference and .49 lower than Fraser et al. Management teachers exhibited higher understanding behaviors than CTE and biology teachers. CTE teachers exhibited higher understanding behaviors than biology teachers. The highest-ranking domain in my study was the helpful/friendly domain, M=3.15. CTE teachers exhibited higher helpful/friendly behaviors than biology and management teachers.

The student responsibility/freedom M=2.14 score difference of only .02 almost equaled Fraser et al.'s (2010) M=2.16; however, Fraser et al.'s M=2.16 and Madike's (2015) M=1.17 score differed by .99. My study strict domain mean score M=.86 was lower than Fraser et al.'s M=2.99 score with a 2.13-point difference, and Madike's M=1.90 mean score difference was 1.09. These mean scores were the highest differences for all the domains. CTE teachers exhibited less strict behaviors than biology and management teachers. Conversely, biology and management teachers exhibited more strict behaviors and less student responsibility/freedom behaviors than CTE teachers. Differences in the studies were in the ranking order and mean scores of the domains.

Low-ranking behaviors are more on the submissive, oppositional, and dominance side and included uncertain, admonishing, and dissatisfied. CTE teachers teaching behavior is higher in the helpful/friendly domain and cooperation side but less in the strict domain when compared to other studies (Fraser et al., 2010; Madike, 2015).

Although respondents' mean scores for student responsibility/freedom and strict domain in my study had large differences between the mean scores, these domains are not always negative. Student responsibility and strict have been found to have positive student outcomes (Fraser et al., 2020; Passini et al., 2015; Wubbels & Levy, 1989). This may be an indication of the need for more professional development opportunities to pair student responsibility/freedom and strict domains with behaviors on the cooperation side of the MITB; for example, creating professional development opportunities to help teachers learn how and when to exhibit strict and student responsibility/freedom behaviors with more cooperative behaviors.

These findings are supported by the interpersonal communication and systems communication theories and the MITB (Leary, 1957; Watzlawick et al., 1967; Wubbels et al., 1985). Interpersonal communication and systems communication are the theories that describe how teachers and students interact in the classroom (Leary, 1957; Watzlawick et al., 1967). Both communication theories focus on communication and are crucial in understanding teachers' interpersonal behaviors and the different underlying messages that can be conveyed to students. As previously stated, communication is part of the social interaction that occurs in the classroom.

For this study, teaching was examined from an interpersonal perspective in terms of the relationship between teacher and students (Wubbels & Brekelmans, 2005; Wubbels et al., 1985). Wubbels and Brekelmans (2005) identified two elements central to this viewpoint: the communication systems approach and MITB. One important element of the systems approach is it focuses on the pragmatic aspects of communication–the effects on the other person involved in the communication process–while the MITB focuses on

the interpersonal aspects of communication (Wubbels & Brekelmans, 2005; Wubbels et al., 1985). "Teaching and learning styles are communicative behaviors that occur when teachers and students interact in a classroom environment" (Madike, 2015, p. 27). As previously stated, communication is part of the social interaction, and the communication process helps to determine the quality of teaching and learning.

The study findings for Research Question 1 were limited; however, the findings revealed the 11 respondents perceived the teacher as having leadership, understanding, and helpful/friendly behaviors based on the mean scores. The mean scores revealed the teacher as having low uncertain, student responsibility/freedom, admonishing, dissatisfied, and strict behaviors. While most findings were fairly aligned across studies with regard to means and rankings of domains, a potentially significant difference was identified in CTE teachers ranking higher in responsibility/freedom and lower in strict than biology teachers. This difference is explored further in the implications section of this chapter.

Research Question 2

The goal of Research Question 2 was to determine the relationship between students' perceptions of teacher's interpersonal teaching behaviors and student achievement in their CTE courses. Because of the low response rate, the analysis using the nonparametric Spearman correlation for Research Question 2 was not conducted. However, Madike's (2015) research findings revealed significant relationships between student perceptions of teacher interpersonal teaching behaviors in leadership, understanding, and helpful/friendly (ps < .001); this suggested as grades increased, leadership, understanding, and helpful/friendly behaviors increased as well. Madike's

study also revealed student perceptions of teacher interpersonal teaching behaviors in admonishing, uncertain, and strict (ps < .001), suggested as grades increased, admonishing, uncertain, and strict behaviors decreased. The student responsibility/freedom domain (p > .05) revealed no significant correlation between grades and this domain.

Leary's (1957) model of interpersonal communication is the theoretical framework that was used in considering Research Question 2. The MITB is divided into two axes – influence (dominance-submission) and proximity (opposition-cooperation) opposition. These axes are divided into eight sectors, and it is believed all teacher interactions can be plotted on these axes (Wubbels et al., 1985). Figure 2 shows each type of teacher behavior.

The eight types of teacher behaviors included leadership, helpful/friendly, understanding, student responsibility and freedom, uncertain, dissatisfied, admonishing, and strict (Maulana et al., 2015; Wubbels & Brekelmans, 2005; Wubbels et al., 1985). The influence dimension (Dominance, D – Submission, S) focuses on who is controlling the communication process, and the proximity dimension (Cooperation, C – Opposition, O) focuses on the cooperation felt by those involved in the communication process (Leary, 1957).

Teacher behaviors can support students academically, socially, and emotionally in several ways (Wubbels et al., 1985). For example, explaining things clearly, being a good listener, being patient, being a good leader, and demonstrating trust are important interpersonal behaviors that may lead to increased student achievement. Teacher interpersonal behaviors are strongly related to student achievement in various grades and

subject matters based on research conducted in the past (Wubbels & Brekelmans, 2005; Wubbels et al., 1985). Conversely, teacher behaviors that could lead to decreased student achievement are those behaviors on the oppositional side of the model. Behaviors on the oppositional side of the model included dissatisfaction, anger, criticism, unfriendly, sarcasm, and irritability. Further studies in the area of academic achievement as it relates to the CTE teacher-student relationship are discussed in the recommendation section.

Research Question 3

The goal of Research Question 3 was to examine whether student perceptions of teacher behaviors differ based on student achievement levels in the CTE course. In other words, the question examined whether students with higher grades rated their teachers more positively and vice versa. Again, the proposed analysis could not be conducted because of a low response rate.

Madike's (2015) study revealed a clear relationship between student grades and perceptions of teacher behaviors. Madike's findings revealed students scoring high grades (As or Bs) rated their teachers significantly higher ($p < .001$) in leadership, understanding, and helpful/friendly than students with lower grades (Cs, Ds, and Fs). Students scoring high grades (As and Bs) rated their teacher behavior significantly lower ($p < .001$) in uncertain, admonishing, dissatisfied, and strict. No significant difference between grade and student responsibility/freedom ($p > .05$) was found.

Although descriptive statistics were only conducted in this study, the findings indicated how students perceived their teacher's classroom behaviors. The 11 respondents perceived the teacher exhibited leadership, understanding, and helpful/friendly behaviors in the classroom. Conversely, students perceived the teacher

exhibited low uncertain, admonishing, student responsibility/freedom, dissatisfied, and strict behaviors in the classroom. The analysis of Research Question 1 revealed how the students perceived the CTE teacher in the classroom with the support of the theoretical framework and Madike's (2015) study. Research Questions 2 and 3 could not be conducted due to the small sample size; therefore, Madike's study could not be fully replicated.

Implications for Positive Social Change

Even though this research has limitations, it can still provide some guidance for positive social change for those working with children in CTE classes. Many studies have been conducted that consistently support the importance of teacher-student relationships and their impact on student achievement (Fraser et al., 2010; Madike, 2015; Passini et al., 2015; Wubbels et al., 1985). According to the CTE students who participated in this study, they perceived CTE teachers as leaders, understanding, and helpful/friendly. CTE teachers showed more cooperation than oppositional, submissive, and dominance behaviors; however, studies have shown student responsibility/freedom and strict domains have been associated with improved student achievement (Passini et al., 2015; Wubbels et al., 1991). In this study, CTE teacher behavior exhibited more student responsibility/ freedom behaviors than biology teachers. The findings revealed the CTE teacher student responsibility/freedom behavior mean score was .97 higher than Madike's (2015). Biology teachers exhibited more strict behaviors than CTE teachers, with a 1.04 higher mean score than my study. As previously stated, these behaviors paired with high cooperation behaviors may increase achievement, therefore leading to more CTE completers.

CTE offers many diverse programs for students; therefore, CTE teachers must possess a specific skill set to prepare students for postsecondary programs or the workforce. Employers find it difficult to fill vacant job positions because the workforce lacks the skills needed for current positions (Carnevale et al., 2017; Meer, 2007; South Carolina Department of Education, 2020c). Increasing the number of students who complete CTE programs and certifications may build a bridge between the unskilled worker and the employer.

As we look to the future, we need to continue to focus on CTE teacher-student relationships and their impact on student achievement. With schools becoming more socially and culturally diversified, it is important for teachers to exhibit positive interpersonal behaviors that will help to build teacher-student relationships and improve student achievement. This research may serve as a guide for those working with children in other fields. It may assist in identifying the needs of CTE students and in developing CTE programs and retention programs, pedagogy, and professional learning opportunities.

Recommendations for Action

The results from this study have the potential to promote change for teachers and students in their day-to-day interactions. Although the study has limitations based on the results, it revealed how these 11 respondents perceived their CTE teachers. This information can be useful in making recommendations to improve teacher-student relationships and achievement. For these recommendations to be implemented, it requires all stakeholders to work collaboratively to develop programs or instructional strategies that are implemented intentionally in the daily classroom routine.

Recommendation 1

According to Hattie (2012), teachers are the most important school-related factor in student achievement. The validity and reliability of the QTI have been found in several studies; therefore, the QTI can serve as a valuable tool to be used by administrators and teachers to provide self-reflection. My recommendation is for teachers to use the QTI during the first 9 weeks of school, at the mid-year point, and again at the end of the last 9 weeks of the year to gather data about their interpersonal behaviors from students. Ideally, teachers should complete the QTI to compare teacher and student results. Once the data are gathered, teachers could use the information to have meaningful conversations with administrators, parents, students, and colleagues about how to improve their interpersonal behaviors in the classroom. Based on the results from the study, professional development should focus on leadership, understanding, and helpful/friendly behaviors; however, a deeper conversation about student responsibility/ freedom and strict behaviors needs to be embedded in the professional development. The implementation of a new initiative may be very challenging.

The implementation of a new initiative cannot be accomplished without support from the district and site and buy-in from teachers. Data teams or professional learning communities could be established to address improving teacher-student relationships to improve achievement. Professional learning opportunities throughout the year could be implemented to support teachers in improving teacher-student relationships and instruction. Teachers who demonstrate or show exceptional leadership, understanding, and helpful/friendly behaviors along with high student responsibility/freedom and strict behaviors should be encouraged to serve as facilitators. Professional leave with pay

should be a consideration for teachers who are willing to serve in this capacity. Facilitators will plan, facilitate, and work collaboratively with the administration and teachers to create professional learning opportunities to meet the teachers' needs.

Finally, time incorporated for teachers to share strategies and activities to build and support teacher-student relationships in the classroom setting should be implemented. Building in restorative practices such as circles to improve CTE teacher-student relationships is one way to improve teacher-student relationships. Classroom circles build community and teacher-student relationships and give everyone an opportunity to engage in activities in the classroom (Clifford, 2013; Davenport, 2018).

Recommendation 2

When students enter high school, little time is spent improving teacher-student relationships. This study can serve as a guide to implement effective strategies to improve teacher-student relationships. My recommendation is to create a curriculum team to create grade-level appropriate relational curriculum for secondary education that addresses building teacher-student relationships. The curriculum team could include stakeholders such as students, parents, teachers, administrators, counselors, and community leaders. The goal of the curriculum team is to create lessons and strategies that could easily be integrated into any classroom. A data collection method would be established for continuous improvement.

One meaningful way to build and establish relationships is the implementation of circle practice. Circles originated in the context of criminal justice, specifically, restorative justice. Restorative justice practice is an alternative method of managing student behaviors (Clifford, 2013). According to Davenport (2018), circle practice is used

for academic, social, and emotional reflective practices with students. A circle routine includes an opening, prompts, and a closing and is a way to build relationships with students. Classroom circles may be modified to meet the needs of the teacher.

A sample classroom circle would be facilitated by starting with a physical space that allows all students to sit in a circle and incorporate a talking piece (i.e., small ball, stuffed animal, or small toy). Next, the facilitator establishes a clear purpose, expectations, and norms of the circle. Once the physical space and expectations are discussed, with an opening prompt provided, the first student shares and passes the talking piece to the left. Students can choose to share when they are handed the talking piece or pass. Prompts can be tailored for specific classroom needs (i.e., Who is the person who has the most influence in your life, and why; How do you feel about this class; What makes you successful in a class?). Students can be encouraged to choose a prompt from a provided list. Finally, closure to the classroom circle routine is provided. Closure can simply be a fist bump or a word on how the student feels.

Classroom circles can be implemented school-wide and can easily be integrated into the classroom. According to Clifford (2013), more instructional time becomes available because teachers and students have calmer and more peaceful experiences. Circles can also be implemented in building relationships among colleagues. Regardless of what strategies are implemented, it will be important for all stakeholders to support the effort and continue to monitor the success of the strategy.

Recommendations for Further Studies

QTI has been successfully used to assess teacher behaviors inside the classroom and to provide insight into student perceptions. The limitations in the study certainly

provide opportunities for further studies in CTE involving teacher-student relationships and achievement. Further studies in CTE are necessary because of the limited number of studies focusing on CTE teacher-student relationships and achievement, and because of the low sample size in this study, the achievement component in this study could not be addressed.

Recommendation 1

The purpose of this quantitative study was to examine CTE student perceptions of teacher interpersonal behaviors and the effect teacher behaviors have on student achievement in their CTE course. While student perceptions were described through analysis, the effect of these perceptions on achievement could not be analyzed because of low participation. My first recommendation is to duplicate this study with a larger sample size so Research Questions 2 and 3 can be analyzed and compared to Madike's (2015) study. With a larger sample size, student perceptions of teacher interpersonal behaviors and their effect on student achievement can be examined fully.

Recommendation 2

Another extension of this study is to examine the perceptions of females enrolled in CTE programs that have a low enrollment of females and their achievement in nontraditional programs. The programs that typically have low female enrollments include networking, engineering, bioscience, and information technology. This study focuses on eight CTE programs. Better insight may be gained from narrowing the scope of the study to gender, race, or career cluster area. Studies that address CTE teacher interpersonal behaviors are limited; however, consideration for extension studies may fill the current gap.

Recommendation 3

African Americans are often among those who are considered as potentially benefiting from CTE programs (Dougherty, 2015; U.S. Department of Education, 2019b). Although African American males know the importance of education, they still suffer from poor achievement (Husband, 2012). This recommendation focuses on African American male perceptions of their CTE teacher and the impact on their achievement in CTE programs. Males were chosen specifically because they earn more CTE credits than females; and White and African American males earn more credit than other minorities (Liu & Burns, 2020). As previously mentioned, this study could possibly fill the gap in the current literature in understanding CTE teacher teaching behaviors among African males who benefit from CTE programs but suffer from poor achievement.

Recommendation 4

This study revealed CTE teachers exhibited more student responsibility/freedom and less strict behaviors than biology teachers and management teachers. My last recommendation is to focus on what types of behaviors CTE teachers need to exhibit in the classroom to improve achievement. When comparing the CTE teachers to biology teachers and management teachers, CTE teachers ranked higher for student responsibility/freedom, but biology teachers and management teachers ranked higher for exhibiting strict behaviors. Student responsibility/freedom and strict behaviors have been associated with improved achievement (Fraser et al., 2010; Passini et al., 2015; Wubbels et al., 1991). A study comparing secondary biology teachers or management teachers to CTE teachers using the QTI may provide insight into the type of teaching behaviors that increases student outcomes. Examining strict and student responsibility/freedom

behaviors paired with high cooperation domains such as leadership, understanding, and helpful/friendly may lead to determining the types of behaviors that increase student outcomes.

Conclusions

The purpose of this study was to determine CTE students' perceptions of teacher interpersonal behaviors and student achievement in CTE classes using the QTI. This study was an intended replication of Madike's (2015) study; however, due to the limitations in the study sample size, the methodology from Madike's was not used to analyze the data. Instead, descriptive analysis (frequency) to determine how students perceive their CTE teacher was the only analysis conducted. Therefore, the results were not significant, and inferences were not made.

Students perceived their teachers as exhibiting leadership, understanding, and helpful/friendly behaviors and fewer admonishing, uncertain, student responsibility/ freedom, dissatisfied, and strict behaviors; however, it was not determined if these perceptions impacted student achievement. Many studies support the findings that the perception of teacher behaviors impacts student achievement in the classroom. According to Hattie (2002, 2003, 2012), one of the most powerful influences in the classroom is the teacher. As a result, it is important to realize teaching behaviors is an important element in supporting student learning and achievement (Fernández-García et al., 2019).

Implications for social change, recommendations for action, and further studies may have a direct or indirect impact on student learning. All students are deserving of teachers who exhibit behaviors that lead to improved student outcomes. As discussed throughout the study, student responsibility/freedom and strict behaviors can be positive

or negative depending on the behaviors paired with these domains. For example, student responsibility/freedom and strict paired with behaviors that are high in cooperation and responsibility impact student outcomes. As educators, we have a responsibility to provide all students with a learning environment where they can learn and grow emotionally, socially, and academically.

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