THE IMPACT OF FLIPPED CLASSROOMS ON ENHANCING STUDENT LEARNING AS PERCEIVED BY MISSOURI CAREER AND TECHNICAL EDUCATION DIRECTORS

by

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ABSTRACT

by

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Many Missouri career and technical education (CTE) centers are based regionally, causing students to lose instructional time because of their commute, due to school scheduling conflicts, and weather conflicts. It was proposed the flipped classroom model could impact instructional time. However, no data were located addressing CTE center directors’ perceptions on implementing the flipped classroom model. Through descriptive survey research, twenty-eight of the 57 CTE center directors (49.1%) responded over a three-week period. Results indicated directors believed the flipped classroom model was a solution to address lost instructional time, (67.86%) and the flipped classroom model was a solution for their school to enhance skill-based learning (82.14%). Additional findings included a majority of directors believed their faculty had the requisite technological skills to flip their classrooms, and the directors could play a role in their faculty’s professional development needs. Four conclusions, five recommendations, and 29 references are provided.
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CHAPTER 1
THE PROBLEM AND ITS SETTING

Background of the Study

Blended learning strategies, also known as ubiquitous learning, continues to grow in popularity as more teachers are implementing flipped classrooms (Andrews, Wilson, & Sheldon, 2014). Garrison and Vaughan, as far back as 2008, indicated the blended learning environment is fundamentally changing the instructional design process to optimize student engagement (2008). Furthermore, millennial and pluralist students may be losing tolerance for lecture-based instruction and desire a learning environment that allows multitasking, collaboration, and socializing (Roehl, Reddy, & Shannon, 2013). Blended learning environments, like the flipped classroom model, allow students to be consumers of knowledge as they access course material whenever and wherever, aligning with the information connectedness millennial students are accustomed to (Roehl et al., 2013).

Proponents suggest the flipped classroom model allow teachers to give quicker feedback while implementing more active learning strategies in the classroom because students are learning key foundational content prior to coming to class (McLaughlin et al., 2013; Poon, 2013). Time spent together in class can better emphasize problem solving, skill development, and gaining a deeper understanding of the subject that translates to more opportunities to learn 21st century skills (Roehl et al., 2013; Topper & Lancaster, 2013). Moreover, flipped classrooms may enhance learning during class and allow learning to continue after the class period ends; students who miss class because of illness, extra-curricular activities, or the weather still have access to instruction and course content (Bergmann & Sams, 2012). This was communicated in an interview with a career and technical education (CTE) director, who leads a shared-time center
that includes different schedules from various sending schools. “For area career centers (career and technical education centers), maximizing instructional time can be a challenge when classes involve students from many schools. School cancellations due to weather and coordinating bus schedules for students to make it to the career center and then return back to their home school create limitations on quality instructional minutes” (Caughron, personal communication, February 5, 2016).

Statement of the Problem

Career and technical education centers constructed in the 1960s and 1970s often serve students from sending-schools within their delivery region consistent with their State Plans of Career and Technical Education (U.S. Department of Education, 2006). Many CTE centers are regionally located causing students to be transported from their home school district to the career and technical center, many times residing in a different school district. The commute may deduct time from the class period where students receive instruction for their career education program. Compounded over the length of the school year, considerable instruction time may be missed. Furthermore, many CTE centers experience out-of-district (sending) students missing regularly scheduled school days due to scheduled school events at their home school and differing school cancellation schedules.

One initiative that may help address lost instructional time is implementing the flipped classroom model in CTE programs. However, building level leadership would be instrumental in implementing this practice. No data were located for this study regarding CTE administrator perceptions on implementing the flipped classroom in CTE centers. Therefore, the problem driving this study was the lack of CTE administrator perceptual data regarding the use of the flipped classroom model within CTE centers.
Purpose of the Study

This study was designed to investigate the perceptions of Missouri CTE center directors regarding the use of the flipped classroom model within Missouri CTE centers.

Research Questions

This study addressed two research questions:

1. What are CTE center directors’ perceptions of the flipped classroom model on instructional time within CTE centers?
2. What are CTE center directors’ perceptions of utilizing the flipped classroom model to enhance skill-based learning within CTE centers?

Definition of Terms

The following terms and definitions were used for this study.

Career and technical education (CTE) center. “Fifty-seven learning institutions across the state of Missouri offering high school and adult students a number of programs in health sciences and skilled technical sciences, such as automotive technology and collision repair, construction technology, electronics, and machine tool technology; programs offered are usually one-and two-year certificates with many offering third-party industry certification” (Missouri Department of Elementary and Secondary Education (DESE), 2011, p. 29). Career and technical education centers are also known as area vocational and technical education schools or centers (AVTS), career and technical centers, career centers, and CTE shared-time centers.

Career and technical education (CTE) center directors. For the purpose of this study, this term will be operationally defined as the lead administrator for secondary level CTE centers. Responsibilities include (but are not limited to) student success, day-to-day operations, personnel/evaluations, finance/budgets, program management, community liaison / engagement,
and other duties normally assigned to lead administrators. While some CTE center directors have all secondary, postsecondary, and adult education responsibilities in their schools, CTE centers in Missouri employ assistant directors and adult education coordinators in addition to the primary CTE center director.

**Career and technical education (CTE).** Education programs responsible for “helping all students acquire challenging academic and technical skills and be prepared for high-skill, high-wage, or high-demand occupations in the 21st century global economy” (U.S. Department of Education, 2016, para 1.).

**Electronic device.** For the purpose of this study, this term refers to any personal, non-educational device with an on-off switch; most commonly: cell phones, smart phones, iPads, tablets, and laptops (New Mexico Public Education Department, 2013).

**Flipped classroom model.** An instructional approach to help teachers move away from direct instruction as their primary teaching tool toward a more student-centered approach (Bergmann & Sams, 2013).

**Sending schools.** For the purpose of this study, this term was operationally defined as school districts participating in a CTE consortium that send students to a CTE center at another school location or another school district for participating in a CTE program.

**Delimitations of the Study**

The following delimitations were presented for this study:

1. This study included only Missouri certified directors employed at career and technical education centers in the state of Missouri.

2. This study did not include principals at comprehensive high schools in the state of Missouri that offered CTE programming.
3. CTE center directors who participated in this study may been employed at career and technical centers that only served home district students and did not serve other district’s (sending-school) students.

Limitations of the Study

The following limitations were identified throughout this research.

1. This study attempted to incorporate a census since the target population was under 100 (N = 57) (Leedy & Ormrod, 2010). However, less than 57 CTE center directors responded, resulting in only a sample of the population (n=27; N = 57). Therefore, the results of this study may not truly represent the population based on Leedy & Ormrod’s recommendation of incorporating a census with populations of 100 or less.

2. The data collection timeline was during the Spring semester, which is traditionally a busy time for CTE career centers and CTE career center directors. This may have negatively impacted participant response rates.

3. The data collection methodology only included a web-based survey. Since no other data collection methodology was used, this may have negatively impacted participant response rates.

Assumptions

The following assumptions were presented for this study:

1. All surveys were answered honestly and accurately.

2. All survey questions were understood by the study’s participants.

3. All career and technical education center directors and teachers were striving to improve the learning process.
4. Sending school schedules and other factors such as inclement weather policies could have impacted instructional time at CTE centers.

**Need and Significance of the Study**

Many educational initiatives focus on learning efficiency, striving to make instructional time the most productive possible (Garrison & Vaughan, 2008). The ever-increasing implementation of technology may be most effective for career and technical education centers to overcome students transported to and from sending schools (Topper & Lancaster, 2013). Furthermore, scheduling remains problematic for career and technical education centers as students often miss class because of conflicting school calendar events at the sending schools. Students accessing course content prior to attending class may enhance learning by allowing active learning strategies and skill-based instruction to be emphasized during class (Du & Wu, 2014). Since there were no CTE administrator perceptual data located for this study, this research investigated the perceptions of Missouri certified CTE center directors regarding the flipped classroom model and how it impacts the student learning process.

**Summary**

This study was designed to investigate the perceptions of directors regarding the use of the flipped classroom model within career and technical education centers in Missouri. Flipped classrooms are fundamentally changing the instructional process by allowing students to be consumers of knowledge, while improving active learning strategies during class (Garrison & Vaughan, 2008; Roehl et al., 2013; “Tales from the Flipped Classroom,” 2014; Topper & Lancaster, 2013). Roehl et al. suggested that tolerance for lecture-based instruction is diminished with millennial students, who require learning environments embracing multitasking, collaboration, and socializing (2013).
Many CTE centers are regionally located requiring students to be transported from their home school district to the CTE center, many times located in a different school district. The commute may deduct time from the class period where students receive instruction for their CTE program. Compounded over the length of the school year, considerable instruction time may be lost. One initiative that may help address lost instructional time is implementing the flipped classroom model in CTE programs. However, building level leadership would be instrumental in implementing this practice. No data were located for this study regarding CTE administrator perceptions on implementing the flipped classroom in CTE centers. Therefore, the problem driving this study was the lack of CTE administrator perceptual data regarding the use of the flipped classroom model within career and technical centers.
CHAPTER 2

REVIEW OF RELATED LITERATURE

Overview

This study was designed to investigate the perceptions of Missouri CTE center directors regarding the use of the flipped classroom model within Missouri CTE centers. This chapter will present the literature that was located and reviewed, which provided a foundation for this research. The literature review included three themes of literature: Blended learning, 1:1 technology initiatives, flipped classrooms, and educator perceptions of flipped classrooms.

Summary of Search Strategies and Terms

The search strategies for this research study were conducted through the James C. Kirkpatrick Library (JCKL) online access on the University of Central Missouri website and Google.com. When searching the JCKL online, the Central Search and ProQuest Career and Technical Education databases were used. The keywords searched were blended classroom, blended learning, career and technical education, flipped classroom, increased student achievement, limited instructional time, student satisfaction, tablets, and 1:1 technology initiative. This search proved effective by producing many peer-reviewed articles including access to full text. Searches involving “blended classroom” and “limited instructional time” produced peer reviewed articles for post-secondary education studies regarding blended learning. Searches for literature involving the flipped classroom model used within career and technical centers produced no literature for this study. The Google search engine was used to identify information regarding the Carl D. Perkins Career and Technical Education Improvement Act of 2006, Missouri Career Guide, and the Missouri State Plan for Career and Technical Education.
**Blended Learning**

The blended learning environment is an instructional design process combining face-to-face learning with online learning (Fleck, 2012). According to Vaughn (2007), blended learning strategies provide students with greater time flexibility and improved learning outcomes as instructional content is accessed through online learning tools. These online instructional tools provide students with learning content inside and outside the traditional face-to-face classroom environment (Vaughan, 2007). Du and Wu (2014 also indicated teachers are able to utilize in-class time more effectively by designing instruction allowing students to use online tools classroom tools that include knowledge-based questions, quizzes, videos, and informational slides. Additionally, the instructional design process allows collaboration within the face-to-face classroom setting by utilizing in-class discussions, case studies, and exercises; thereafter, students can access discussion boards, homework and quizzes, and collaborate with their classmates outside of class (Du & Wu, 2014). A major benefit for students is “the access to knowledge that blended learning creates for ‘traditional courses’ combining educational technology delivery methods” (Morera-Gutierrez, 2006, p. 317). Students are able to access course materials on their own time when it is best for them.

Poon (2013) investigated university student and faculty perceptions regarding the effect of a blended learning environment. The study was conducted on the campus of Nottingham Trent University in the United Kingdom in 2011. The data collected for the study came from interviews of nine academic program leaders within the university. Poon conducted faculty interviews that lasted between forty-five and ninety minutes, and collected student-perceptual data through two-hundred-and-sixty submitted student questionnaires. Faculty described the availability of resources as an important factor for creating a successful learning environment.
Many of the faculty indicated the use of blended learning strategies requires a great deal of upfront time, work, and energy (Poon, 2013). The findings of this study implied the primary benefit of blended learning was the flexibility created within a course. Instruction can be created for a diverse group of student learners who have differing needs as they are instructed throughout the course. Findings also suggested improved learning through the use of simulated work experiences, such as field trips, observations, and case studies that provided hands-on experiences and collaboration thereafter facilitated through technology. Poon also concluded students were achieving higher grades and developing a greater understanding of course content because of blended courses. Regarding findings at the institutional level, Poon concluded that institutions implementing blended learning reported decreases in student dropout rates and withdrawal rates.

Vaughan (2014) investigated higher education students’ experiences in a blended learning environment by using a mixture of student interviews, student surveys, and focus groups. The study involved 273 students and eight instructors participating in blended courses. Pre-course and post-course interviews were conducted of each instructor to determine web-based applications used and instructional design methods. Furthermore, a 75-item online survey was conducted of the students participating in the course to study perceptions about student engagement. Findings suggested that 92% of students agreed or strongly agreed they would recommend a blended course to others. Vaughan also concluded, based on both instructors and student data, that blended courses created a tendency to cover too much material instead of focusing on key concepts and ideas (Vaughan, 2014). However, students were able to control their own pace of learning and indicated they believed teachers were more empathetic in blended courses.
1:1 Technology Initiatives

According to Topper and Lancaster (2013), school districts were rethinking instructional design to allow more students with access to technology to use their technology in the learning environment. The 1:1 technology initiative “provides each student with a school-provided laptop, netbook, or tablet for use at school and at home” (Topper & Lancaster, 2013, p. 346). The rationale behind 1:1 is connecting students with new learning opportunities that go beyond the walls of the classroom (Hatakka, Andersson, and Gronlund, 2013). As stated by Lowther, Inan, Ross, and Strahl (2012):

Educators have been challenged by stakeholders to provide students with 21st century knowledge and skills such as critical thinking, communication, collaboration, and creativity. According to U.S. employers, high school graduates entering the workforce are deficient in most of the 21st century skills needed to have a successful career. One-to-one technology initiatives have been adopted by schools to gain 21st century knowledge and skills while increasing student performance (p. 2).

Topper and Lancaster (2013) further supported the 1:1 initiatives, indicating “Early results of 1:1 initiatives suggest improvements in student writing skills, motivation and engagement in learning, and development of 21st century skills, including project development, and research and communication” (p. 348).

As far back as 2009, data suggested one-to-one initiatives were found to increase curiosity, excitement, and collaboration for students in the classroom. Furthermore, students may be more motivated to learn and understand the effectiveness of using technology (Maninger & Holden, 2009). Maninger and Holden (2009) investigated the one-to-one initiative using laptop computers with fifth through eighth grade students. The study took place over the course
of a two-year period in a private K-8 school in a major metropolitan city in the southwestern United States whose school board decided to implement the one-to-one technology initiative for their student population. Fifteen teachers participated in this study along with 106 students who were observed. Through this study, students had access to their own portable laptop computer to engage with course material both inside and outside of the classroom. The researchers used descriptive statistics to analyze observational, survey, and teacher interview data. The findings produced several main themes. The first major theme was teachers acknowledged increased student collaboration because of the one-to-one initiative. Students indicated they were more willing to assist their peers with technology and learning challenges. Additionally, teachers acknowledged they were better able to integrate instruction for students with learning difficulties. Teachers also indicated they believed students had access to more information than could have ever been provided without the one-to-one initiative. This allowed students to take ownership of their learning instead of relying on teachers alone to be content experts.

However, in their findings Maninger and Holden (2009) cited many cases as far back as 2009 involving the 1:1 initiative that suggested teachers lacked basic computer knowledge and were not sufficiently motivated to allow technology to contribute to the learning process. Topper and Lancaster (2013) indicated that teacher professional development opportunities were available to learn about technology integration into the classroom; however, many of those activities may not have provided sufficient training in effectively integrating technology throughout instruction. While 1:1 technology initiatives provided many positives, “the overall picture (of 1:1 initiatives) provides mixed results, and these projects are not without drawbacks and challenges” (Topper & Lancaster, 2013, p. 348).
The Basics of the Flipped Classroom Model

In a flipped classroom, “the learning process is done the other way around: the teacher ‘delivers’ lectures before class in the form of pre-recorded videos and spends class time engaging students in learning activities that involve collaboration and interaction” (Mok, 2014, p. 7). Students are accessing course content as consumers, learning from online videos and resources at their own speed and when needed (‘Tales from the Flipped Classroom,” 2014). Students may benefit from watching online videos at home because they can fast-forward through sections of the lecture they understand or stop and review areas they are having difficulty (Goodwin & Miller, 2013).

McLaughlin et al. (2013) investigated the flipped classroom that included students participating in a post-secondary pharmacetics course. The research study involved 162 participants from two different campuses (McLaughlin et al., 2013). In this study, two concurrent years of data were collected. Each year the researchers incorporated a different delivery style to teach the course. McLaughlin et al. summarized:

In 2011, the course was taught with the traditional lecture-based instructional design where 75-minutes of class time was lecture, occasionally followed by 15-minute learning activities. However, in 2012, the flipped classroom model was implemented where students viewed self-paced online videos outside of class time to receive foundational course content. Thereafter, students attended regularly scheduled class periods where they participated in active-learning exercises producing real-time formative assessments facilitated by the instructor (p. 2).

Student surveys were administered to the participants through pre-course and post-course surveys to investigate student perceptions. Findings from the student surveys suggest “the belief
that learning key foundational content prior to coming to class greatly enhanced in-class learning” (McLaughlin et al., 2013, p. 1).

Course final exam data were also collected and analyzed from the two year data. Findings. Students from Year 1 (traditional instructional delivery) had a final exam score average of 154.1/200, while students from Year 2 (flipped classroom model) had a final exam score average of 152.1/200. The course final exam data found no significant difference in achievement ($p = .31$).

Through the flipped classroom, traditional class time is used for active learning strategies, translating to higher-order thinking skills. Allowing students to participate in active learning strategies such as analysis, evaluating, and creating enhances the learning process for higher student achievement (Roehl et al., 2013). The role of the classroom teacher evolves to a facilitator of the learning process where instruction has expanded past the constraints of a 50-minute class period and the walls of the classroom (“Tales from the Flipped Classroom,” 2014). The flipped classroom model allows for learning to continue after the class period ends. Students who miss class because of illness, extra-curricular events, or a snow-day still have access to instruction and course content (Bergmann & Sams, 2012).

The Flipped Learning Network (2012) performed a survey of 453 teachers who have implemented the flipped classroom and 99 percent of the teachers report they would use the flipped classroom again. The survey reports 80 percent of the classrooms saw improved student attitude while 67 percent reported improved test scores. Science and Math were the most common subjects where the flipped approach was utilized. The flipped classroom particularly benefited advanced placement and at-risk students (Flipped Learning Network, 2012).

According to Roehl et al. (2013), tolerance for lecture-based instruction is diminished
with millennial students. “A sense of urgency to adapt to millennial learning preferences is heightened as educators increasingly struggle to capture the attention of today's students (Roehl et al., 2013).” Millennial students have constant information connectedness along with a preference to multitask, collaborate, and socialize (Roehl et al., 2013). For some students, lecture-based instruction is problematic because of several reasons: (1) the pace of the information coming from the lecturer may not be suitable for students; (2) students may already know the material; and finally, (3) the student may lack prior knowledge to understand concepts being presented (Goodwin & Miller, 2013).

**The Flipped Classroom Model in Education**

Zainuddin and Halili (2016) conducted a content analysis involving flipped classroom research in education occurring between 2013 and 2015. As reported by Zainuddin and Halili, Baepler, Walker, and Driessen (2014) discovered student achievement in a flipped classroom was significantly higher than a conventional classroom, and students' perceptions of the learning environment were improved. According to Zainuddin and Halili (2016), the flipped classroom was the catalyst for improved student achievement in both an English course and Calculus course by creating a more effective feedback process. The instructor could evaluate students' improvement in their learning activities while the students could understand what needed to be done to overcome their deficiencies in learning (Zainuddin & Halili, 2016).

The flipped classroom caused enhanced student engagement by providing a learning environment where students participated in discussions, exchanged ideas and experiences, and solved problems with their peers (McLaughlin et al., 2013). Zainuddin and Halili (2016) reported there was evidence of improved attendance and student motivation across all subjects where the flipped classroom was used because students were more engaged and satisfied with the class
meeting. This was contrary to traditional classrooms where students were reportedly disengaged with their learning environment leading to boredom, restlessness, and disruptive behavior (Zainuddin & Halili, 2016). Zainuddin and Halili also reported the flipped classroom enabled students to build a learning community and exchange ideas to solve problems through dialogue inside the class or through the virtual classroom. This type of interaction within a learning community allowed students to be intrinsically motivated about their learning, ultimately resulting in better understanding of course content.

Zainuddin and Halili suggested the flipped classroom model did not come without some negative experiences. Their researchers reported that teachers indicated they sometimes lacked the pedagogy to effectively implement the flipped classroom model. Teachers also reported that they struggled in having enough time to record videos before the start of the school year in order to effectively provide flipped classroom materials needed prior to the classroom discussions (Zainuddin & Halili, 2016).

**CTE center directors’ Perceptions of the Flipped Classroom Model**

There was no literature located for this study that specifically addressed CTE center directors’ perceptions of the flipped classroom model. Therefore, the problem driving this study was the lack of perceptual data from CTE center directors regarding their perceptions of the flipped classroom model in career and technical education centers.

**Summary of the Literature Review**

According to Roehl et al. (2013), the millennial student is not tolerant of traditional lecture-based instruction, instead wanting access to course material that can be accessed anytime and anywhere (Roehl et al., 2013). Blended learning strategies may provide students with greater time flexibility and improved learning outcomes as instructional content is accessed through
web-based classroom environments (Vaughan, 2007). Students participating in a blended learning environment participate in active learning strategies during class time in addition to getting quicker feedback (Poon, 2013). Many students have reported the teacher is more empathetic and dropout rates have decreased with blended learning (Poon, 2013).

As reported by employers, students entering the workforce were lacking 21st century skills involving critical thinking, communication, collaboration, and creativity (Lowther et al., 2012). Implementing 1:1 technology initiatives may allow students to encounter learning with 21st century skills in mind (Topper & Lancaster, 2013). These technology initiatives have allowed the flipped classroom model to become a feasible solution in schools. Students in flipped classrooms interact with instruction through online videos prior to entering the classroom. Through the flipped classroom, traditional class time is used for active learning strategies, translating to higher-order thinking skills. Allowing students to participate in active learning strategies such as analysis, evaluating, and creating the learning process is enhanced for higher student achievement (Roehl et al., 2013). The flipped classroom model allows millennial students to utilize active learning strategies while also connecting students with technology in a way that is geared toward their strengths (Roehl et al., 2013).

According to Zainuddin and Halili (2016), the flipped classroom was the catalyst for improved student achievement in both an English course and Calculus course by creating a more effective feedback process. The instructor could evaluate students' improvement in their learning activities while the students could understand what needed to be done to overcome their deficiencies in learning. Zainuddin and Halili (2016) reported evidence of improved attendance and student motivation across all subjects where the flipped classroom was used because students were more engaged and satisfied with the class meeting. The flipped classroom enabled
students to build a learning community and exchange ideas to solve problems through dialogue inside the class or through the virtual classroom (Zainuddin & Halili, 2016). Zainuddin and Halili (2016) suggested the flipped classroom model did not come without some negative experiences. Their research found teachers sometimes lacked the pedagogy to effectively implement the flipped classroom model. Teachers also struggled in having enough time to record videos before the start of the school year in preparation for implementing the flipped classroom model (Zainuddin & Halili, 2016).

Searches for literature involving the flipped classroom model used within career and technical education centers was unsuccessful, nor was literature located addressing CTE center directors’ perceptions regarding implementing the flipped classroom. Therefore, the problem driving this study was the lack of perceptual data from CTE center directors regarding their perceptions of the flipped classroom model in career and technical education centers.
CHAPTER 3

METHODOLOGY

Overview

This study was designed to investigate the perceptions of Missouri CTE center directors regarding the use of the flipped classroom model within Missouri CTE centers. To address this problem, descriptive survey research was used to collect and organize the data through a web-based survey instrument. This chapter presents a discussion on the population and sample, research design, data collection methodology, data analysis, and chapter summary.

Population and Census

Population. The population of this study consisted of CTE center directors employed at career and technical centers across the state of Missouri. The Missouri Department of Elementary and Secondary Education (DESE) website identified 57 career and technical education centers that existed in Missouri (Missouri DESE, 2015).

Census. Given the researcher’s intent to include all CTE center directors in this study, a census was attempted. In addition, because the target population (N = 57) was less than 100 participants, Leedy and Ormrod (2010) recommended a census be conducted for populations less than 100 participants.

Research Questions

The following research questions guided this study:

1. What are CTE center directors’ perceptions of the flipped classroom model on instructional time within CTE centers?

2. What are CTE center directors’ perceptions of utilizing the flipped classroom model to enhance skill-based learning within CTE centers?
Research Design

This study was designed to investigate the perceptions of CTE center directors regarding the use of the flipped classroom model within career and technical education centers in Missouri. To meet this need, the researcher incorporated a descriptive survey research design to collect the required data to address the problem driving the study. Leedy and Ormrod (2010) recommended survey research to glean insight into participants’ opinions, attitudes, or previous experiences.

Data Collection Instrument

Data were collected using a researcher-developed, web-based survey using SurveyMonkey. SurveyMonkey granted the researcher permission for use because this research was for academic purposes (see Appendix A).

The survey consisted of nineteen statements regarding the general use and philosophy of the flipped classroom model within career and technical education centers. The researcher developed specific questions placed randomly throughout the survey to address Research Questions One and Two. In addition, the researcher incorporated additional questions designed to collect director perceptions related to the flipped classroom but not directly related to the research questions. Consistent with survey construction recommendations by Leedy and Ormrod (2010), each statement incorporated a Likert-type 5-point rating scale: Strongly agree, somewhat agree, sometimes, somewhat disagree, and strongly disagree.

The researcher constructed the statements and rating scale with readability and decipherability in mind. The instrument was created based on professional literature and in consultation with content area experts. The researcher’s thesis committee then validated the instrument. The participant cover letter, human subjects consent letter, and researcher-developed survey are located in Appendices B, C, and D, respectively.
Institutional Review Board (IRB)

Before data collection began, the researcher pursued an Institutional Review Board (IRB) Exempt level of review (Appendix E). The following reasons led the researcher to pursue an Exempt level of review: (1) research participants were not exposed to anything greater than minimal risk as defined by the University’s – Institutional Review Board, (2) data collection and data analysis was anonymous, and (3) the research study did not involve minors, prisoners, nor target pregnant women (University of Central Missouri, 2014). One revision was requested by the IRB regarding wording inconsistencies on the application compared to the survey and research proposal. The researcher received IRB approval May 20, 2016, in a letter dated June 2, 2016 (see Appendix F).

Data Collection Methodology

Gathering contact information for career and technical center directors. Upon receiving IRB approval, the researcher contacted Bob Larivee, Executive Director of Missouri Council of Career and Technical Directors (MCCTA) on June 7, 2016. The purpose of this initial contact was to gather contact information for Missouri’s career and technical center directors and to request Mr. Larivee to promote the research study in an effort to gain more participants. Mr. Larivee agreed to promote the research study by emailing CTE center directors, which he did on June 21, 2016 (See Appendix G). Additionally, Mr. Larivee provided an MCCTA email list of CTE center directors.

Data collection request. After obtaining contact information for career and technical education center directors, an email was sent to each director on June 22, 2016, using SurveyMonkey (see Appendix G). The email included a link to the online data collection instrument (see Appendix D). In addition to facilitating the data collection instrument,
SurveyMonkey organized and stored the data throughout the collection process while also securing it.

Once the participants selected the online data collection link, they were required to view the participant content letter before progressing to the survey. If the participants did not agree to the information presented in the consent letter, they could opt out of the research. If they agreed to the information presented in the consent letter, they indicated their approval by selecting the link to proceed to the actual survey. Consistent with the consent form, participation was voluntary and the participants could stop responding at any time. Upon survey completion, research study participants received an automated email thanking them for participating in the study.

The initial data collection phase was open from June 22, 2016, until June 29, 2016. During this time, 23 directors opened the online survey. Of these 23 directors, all but one director agreed to participate in the research study (per the consent form), thus suggesting the director was not interested in participating in the study. One director submitted an incomplete survey with no selected data available to collect, leaving 21 research study participants in the initial data collection window. The response rate during the initial data collection phase was 36.8%. (21 out of 57). The actual SurveyMonkey email indicated it was sent to 61 email addresses. However, there were four duplicates, resulting in the total number of participants equaling 57.

**Follow-up data collection request.** A follow-up email was sent on June 30, 2016, to directors who had not yet participated in the research study. This follow-up email resulted in seven additional responses, increasing the response rate by 12.3%. This second data collection phase remained open until July 13, 2016. Combining the initial data collection phase responses
(n = 21) with the second data collection phase (n = 7) resulted in a total number of responses for the research study to 28. In total, the entire data collection phase over three weeks resulted in a response rate of 49.1%.

**Data Analysis Methodology**

Descriptive statistics were used to analyze data based on the research design (descriptive survey research), the use of ordinal data, and the use of one variable (Leedy & Ormrod, 2010). Once all survey responses were submitted on SurveyMonkey, the data were aggregated for each survey question. The Likert-type 5-point rating scale was used in the research study to determine the level of agreement for each statement. The rating scale used strongly agree, somewhat agree, sometimes, somewhat disagree, and strongly disagree. Responses were then converted to numeric values to assist in calculating mean scores for each survey question: “Strongly agree” to 5 points, “somewhat agree” to 4 points, “sometimes” to 3 points, “somewhat disagree” represents 2 points, and “strongly disagree” represents 1 point. This descriptive study presented findings in the form of frequency counts and means.

**Summary of the Methodology**

According to Roehl et al. (2013), the flipped classroom model allows students to interact with course material through online instructional strategies prior to attending a traditional class meeting. Students use traditional class meetings to participate in active learning strategies to enhance skill acquisition and student achievement (Roehl et al., 2013). Caughron suggested CTE centers face challenges when trying to maximize instructional time because of the many factors involved affecting the school calendar (personal communication, February 5, 2016). Two research questions were presented for the study: (1) What are CTE center directors’ perceptions of the flipped classroom model on instructional time within CTE centers? and (2) What are CTE
center director’s perceptions of utilizing the flipped classroom model to enhance skill-based learning within CTE centers?

The population of this study included all Missouri CTE center directors (N = 57). Based on Leedy and Ormrod’s (2019) recommendations, a census was used since the population was under 100. Therefore, this study attempted to collect data from the entire population of CTE center directors in Missouri. With the assistance of the Missouri Council of Career and Technical Administrators (MCCTA), emails advertising the study were sent to all fifty-seven CTE center directors.

Incorporating the descriptive survey research design, the researcher developed 19-item survey instrument to be implemented using the online SurveyMonkey data collection system. The survey instrument included a Likert-type 5-point rating scale to determine the level of agreement for each statement within the survey. The rating scale used five criteria for respondents to use: strongly agree, somewhat agree, sometimes, somewhat disagree, and strongly disagree.

Prior to data collection, an Exempt level of review application was submitted to the University’s Institutional Review Board (IRB), which was approved on May 20, 2016. Using SurveyMonkey’s automated email system, surveys were distributed to all 57 CTE center directors. The data collection period was open from June 22, 2016, to July 13, 2016, which included one follow-up period. Both data collection periods resulted in 28 respondents (49.1%) who provided data for the research. Data were analyzed using the appropriate descriptive statistics.
CHAPTER 4
DATA ANALYSIS

Introduction

The purpose of this study was to investigate the perceptions of Missouri CTE center directors regarding the use of the flipped classroom model within Missouri CTE centers. The study was guided by two research questions: (1) What is the perception of the flipped classroom model on instructional time within career and technical centers? and (2) What is the perception of utilizing the flipped classroom model to enhance skill-based learning within career and technical centers? Twenty-eight out of 57 CTE center directors responded to the survey over a three-week data collection phase, providing a 49.1% response rate.

Overview of Research Data by Survey Question

Table 1 represents a summary of all survey question frequencies and specific question means. Appendix H provides specific Likert-type responses by survey question.

Research Question One

Research Question One stated, “What are CTE center directors’ perceptions of the flipped classroom model on instructional time within CTE centers?” To address this research question, the researcher used survey questions five, six, and eight. Therefore, directors were tasked with answering multiple questions that would help identify their belief regarding the use of the flipped classroom model as a feasible solution to overcome lost instructional time for their respective school. A rating of “strongly disagree (1)” indicated directors do not believe the flipped classroom model is a feasible solution to overcome lost instructional time for their school. A rating of “strongly agree (5)” indicated directors believed the flipped classroom model was a feasible solution to overcome lost instructional time.
Table 1

*Flipped Classroom (FC) Survey Question Frequencies and Means*

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Frequency</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My school regularly uses FC to connect students with course mater.</td>
<td>28</td>
<td>2.71</td>
</tr>
<tr>
<td>2. FC would enhance skill-based learning at my school.</td>
<td>28</td>
<td>4.00</td>
</tr>
<tr>
<td>3. Faculty at my school have received training in FC.</td>
<td>28</td>
<td>2.46</td>
</tr>
<tr>
<td>4. Faculty at my school would be successful using FC.</td>
<td>28</td>
<td>3.50</td>
</tr>
<tr>
<td>5. FC would be feasible for overcoming lost instructional time.</td>
<td>28</td>
<td>3.64</td>
</tr>
<tr>
<td>6. FC would allow for more in-class time for skills training.</td>
<td>28</td>
<td>3.78</td>
</tr>
<tr>
<td>7. Learning would be enhanced by using OL mater. prior to skills inst.</td>
<td>28</td>
<td>3.93</td>
</tr>
<tr>
<td>8. Student absences/lost inst. time is being addressed by technology.</td>
<td>28</td>
<td>3.54</td>
</tr>
<tr>
<td>9. FC would be successful since students have necessary tech. support.</td>
<td>28</td>
<td>3.18</td>
</tr>
<tr>
<td>10. FC would improve student achievement through learning efficiency.</td>
<td>28</td>
<td>3.50</td>
</tr>
<tr>
<td>11. Faculty are tech savvy enough to implement FC.</td>
<td>28</td>
<td>3.00</td>
</tr>
<tr>
<td>12. FC would improve student motivation.</td>
<td>27</td>
<td>3.26</td>
</tr>
<tr>
<td>13. FC would allow students to experience more in-class skill develop.</td>
<td>28</td>
<td>3.79</td>
</tr>
<tr>
<td>14. FC would help develop 21st Century Skills.</td>
<td>28</td>
<td>3.54</td>
</tr>
<tr>
<td>15. Using OL course mater. when absent would improve. stud. achieve.</td>
<td>28</td>
<td>3.71</td>
</tr>
<tr>
<td>16. Lost instructional time is a major problem for my school.</td>
<td>28</td>
<td>3.46</td>
</tr>
<tr>
<td>17. Students use inst. videos outside class for more skills inst. in class.</td>
<td>28</td>
<td>2.39</td>
</tr>
<tr>
<td>18. Students use OL disc. bds. outside class to enhance learning in class.</td>
<td>28</td>
<td>2.07</td>
</tr>
<tr>
<td>19. I feel confident to lead FC PD activities for my staff.</td>
<td>28</td>
<td>3.32</td>
</tr>
</tbody>
</table>
Survey question five was the first survey question to address Research Question One. CTE center directors responded to a statement regarding the belief the flipped classroom model would allow help overcome lost instructional time. Table 2 provides the distribution of responses.

Table 2

<table>
<thead>
<tr>
<th>Flipped Classroom Model to Overcome Lost Instructional Time (Survey Question 5)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>4</td>
<td>14.29%</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>15</td>
<td>53.57%</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>5</td>
<td>17.86%</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>3</td>
<td>10.71%</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>1</td>
<td>3.57%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
</tr>
</tbody>
</table>

As Table 2 shows, 67.86% of directors indicated they strongly agreed or somewhat agreed with the belief the flipped classroom model will help their school overcome lost instructional time. The largest number of respondents, 15 directors (53.7%), indicated they somewhat agreed that the flipped classroom model was a feasible solution to overcoming lost instructional time. Four directors (14.28%) indicated disagreement with the belief the flipped classroom model would help their school overcome lost instructional time, while one director indicated strong disagreement with the flipped classroom instructional strategy. Five directors (17.86%) indicated they were neutral to the idea. The mean score for directors was 3.64, which
indicates a favorable view of the flipped classroom model being a feasible solution to overcome lost instructional time for Missouri’s CTE centers.

Survey question six also addressed Research Question One. CTE center directors responded to a statement regarding the belief the flipped classroom model would allow students more time for skill-based training at their respective school. Table 3 provides the distribution of responses.

Table 3

| Flipped Classroom Allows More Time for Skill-Based Training (Survey Question 6) |
|------------------------------|----------------|-----------|
|                              | Frequency | Percent |
| Strongly agree (5)           | 5         | 18.52%   |
| Somewhat agree (4)           | 15        | 55.56%   |
| Sometimes (3)                | 4         | 14.81%   |
| Somewhat disagree (2)        | 2         | 7.41%    |
| Strongly disagree (1)        | 1         | 3.70%    |
| Total                        | 27        | 100%     |

As Table 3 illustrates, 74.08% of directors indicated they strongly agreed or somewhat agreed to the belief the flipped classroom model would allow students more time for skill-based training at their respective school. The largest number of respondents to this survey question, 15 directors (55.6%), indicated they somewhat agreed the flipped classroom model would allow students more time for skill-based training. Three directors (11.11%) indicated they disagreed with the belief the flipped classroom model would allow students more time for skill-based training.
training, while one administrator reported strong disagreement with the instructional strategy. Four directors (14.81%) remained neutral to the idea.

For this statement on the survey, only 27 responses were collected indicating one study-participating administrator did not provide a response. The mean score for directors was 3.78, which suggests a favorable view of the flipped classroom model being a feasible solution to provide more time for skill-based training within Missouri’s career and technical education centers.

The final survey question that addressed Research Question One was survey question eight. Table 4 provides the distribution of responses from directors regarding the belief that lost instructional time is a problem their school is trying to solve through the use of instructional technology.

Table 4

<table>
<thead>
<tr>
<th>Overcoming Lost Instructional Time through Technology (Survey Question 8)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>6</td>
<td>21.43%</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>11</td>
<td>39.29%</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>5</td>
<td>17.86%</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>4</td>
<td>14.29%</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>2</td>
<td>7.14%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
</tr>
</tbody>
</table>

As Table 4 illustrates, 60.72% of Missouri CTE center directors responded indicated they strongly agreed or somewhat agreed to the belief that lost instructional time was a problem their
school was trying to solve through the use of instructional technology. The largest number of respondents, 11 directors (39.29%), indicated they somewhat agreed that lost instructional time was a problem their school was trying to solve through the use of technology. Six directors (21.43%) indicated disagreement with the belief that lost instructional time is a problem their school was trying to solve through the use of instructional technology, while two directors indicated their strong disagreement with the statement. Five directors (17.86%) remained neutral to the idea. The mean score for this statement was 3.54, which suggests that lost instructional time was a problem that Missouri’s career and technical education centers were trying to solve through the use of instructional technology.

Research Question Two

Research Question Two stated, “What are CTE center directors’ perceptions of utilizing the flipped classroom model to enhance skill-based learning within CTE centers?” To address this research question, the researcher used survey questions two and 14. Like Research Question One, directors were tasked with answering multiple questions that would help identify their beliefs regarding the use of the flipped classroom model as a feasible solution to enhance skill-based learning for their school. Table 5 provides the number of responses and percentage of responses for survey question two.

As illustrated in Table 5, 82.14% of Missouri CTE center directors indicated they strongly agreed or somewhat agreed to the belief the flipped classroom model is a feasible solution for their school to enhance skill-based learning. The largest number of respondents, 15 directors (53.7%), indicated they somewhat agreed the flipped classroom model would enhance skill-based learning. Two directors (7.14%) indicated disagreement with the belief the flipped classroom model was a solution for their school to enhance skill-based learning, while one
administrator showed strong disagreement to the strategy. The mean score for Missouri CTE center directors for this survey question was 4.0, which indicates a favorable view of the flipped classroom model being a feasible solution to enhance skill-based learning for career and technical centers in the state of Missouri.

Table 5

*Flipped Classroom Model to Enhance Skill-Based Learning (Survey Question 2)*

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>8</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>15</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>3</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>1</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
</tr>
</tbody>
</table>

Survey question 14 also addressed Research Question Two. Missouri CTE center directors responded to this question that sought insight into their belief the flipped classroom model would allow students at their school to develop 21st Century Skills (employable skills) such as critical thinking, collaboration, and multi-tasking. Table 6 provides an overview of responses.

As illustrated in Table 6, 57.14% of Missouri CTE center directors indicated they strongly agreed or somewhat agreed to the belief the flipped classroom model would allow students at their school to develop employable skills such as critical thinking, collaboration, and multi-tasking. The largest number of respondents to this survey question, 14 directors (50.00%),
indicated they somewhat agreed the flipped classroom model would allow students at their school to develop employable skills. Two directors (7.14%) indicated they disagreed with the belief the flipped classroom model would allow students at their skill to develop employable skills such as critical thinking, collaboration, and multi-tasking. The mean score for directors on this survey question was 3.54, which suggests a favorable view of the flipped classroom model being a feasible solution to develop employable skills for students in Missouri’s CTE centers.

Table 6

*Flipped Classroom Model to Develop 21st Century Skills (Survey Question 14)*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>2</td>
<td>7.14%</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>14</td>
<td>50.00%</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>10</td>
<td>35.71%</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>1</td>
<td>3.57%</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>1</td>
<td>3.57%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Additional Research Data**

The nineteen statements within the researcher-developed survey provided additional research data beyond the two research questions presented in this study. Most notable were three survey questions addressing (1) allowing students access to online course materials in general prior to skills-based learning but not mentioning the term “flipped classroom” (survey question seven), (2) the CTE center directors’ perceptions that their faculty would have the technological skills to be able to implement the flipped classroom model (survey question 11), and (3) the CTE
center directors’ perceptions that they possess the abilities to provide professional development in flipped classroom skills for their faculty (survey question 19).

**Allowing students online access to course materials prior to classroom instruction.** Without using the term “flipped classroom,” survey question seven requested the CTE center directors’ perceptions regarding the belief that student learning would be enhanced by allowing students online access to course material and instructional videos prior to skill-based training at their school. Table 7 provides the distribution of director responses.

Table 7

*Enhancing Learning Through Online Access to Course Material (Survey Question 7)*

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>8</td>
<td>28.57%</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>14</td>
<td>50.00%</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>3</td>
<td>10.71%</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>2</td>
<td>7.14%</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>1</td>
<td>3.57%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
</tr>
</tbody>
</table>

Per Table 7, 78.57% of directors indicated they strongly agreed or agreed that student learning would be enhanced by allowing students online access to course material and instructional videos prior to skill-based training at their school. The largest number of respondents to this survey question, 14 directors (50.00%), indicated they somewhat agreed that learning would be enhanced by allowing students online access to course material and instructional videos prior to skill-based training at their school. Three directors (10.71%)
indicated they disagreed with the belief learning would be enhanced by allowing students online access to course material and instructional videos prior to skill-based training at their school. The mean score for directors on this survey question was 3.93, which suggests a favorable view that learning would be enhanced by allowing students online access to course material and instructional videos prior to skill-based training in Missouri’s CTE centers.

**Faculty member’s technological ability to implement the flipped classroom model.**

An additional survey question (question 11) attempted to gain CTE center directors’ perceptions on whether their faculty had the technological skills to be successful in implementing the flipped classroom model. Table 8 provides the distribution of responses.

Table 8

*Faculty Technological Abilities for Utilizing the Flipped Classroom Model (Survey Question 11)*

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>2</td>
<td>7.14%</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>12</td>
<td>42.86%</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>12</td>
<td>42.86%</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>2</td>
<td>7.14%</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
</tr>
</tbody>
</table>

Per Table 8, 50% of directors responded with agreement to the belief faculty had the requisite technological skills to be successful in utilizing the flipped classroom model at their school. Twelve directors (42.86%) remained neutral and two directors (7.14%) indicated their disagreement with the belief faculty had the requisite technological skills to be successful in
utilizing the flipped classroom model at their school. The mean score for directors on this survey question was 3.00, which suggests a favorable view that faculty would be successful in utilizing the flipped classroom model based on faculty members’ technological skills.

**CTE center directors’ abilities to conduct flipped classroom professional development.** An additional survey question (question 19) attempted to gain CTE center directors’ perceptions on whether they possessed the abilities to provide professional development in flipped classroom skills for their faculty. While survey question 3 data suggested that CTE center directors perceived that their faculty had not received training in the flipped classroom model (2.63; see Table 1), Table 9 provides the distribution of responses regarding the directors’ perceptions they (the directors) had the necessary skills to provide professional development for their faculty.

Table 9

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree (5)</td>
<td>2</td>
<td>7.14%</td>
</tr>
<tr>
<td>Somewhat agree (4)</td>
<td>12</td>
<td>42.86%</td>
</tr>
<tr>
<td>Sometimes (3)</td>
<td>8</td>
<td>28.57%</td>
</tr>
<tr>
<td>Somewhat disagree (2)</td>
<td>5</td>
<td>17.86%</td>
</tr>
<tr>
<td>Strongly disagree (1)</td>
<td>1</td>
<td>3.57%</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100%</td>
</tr>
</tbody>
</table>
Per Table 9, 50% of directors responded they “strongly agreed” or “agreed” that they believed they had the skills to provide professional development in the flipped classroom model for their faculty. However, 21.43% responded they “disagreed” or “strongly disagreed” that they had the requisite skills to provide professional development for their faculty. Eight CTE center directors indicated they “sometimes” possessed the skills to offer professional development in the flipped classroom model. The mean score for directors on this survey question was 3.32, which suggests a favorable view that CTE center directors had the abilities to provide professional development in the flipped classroom model to their faculty.

**Summary of Results**

This study was designed to investigate Missouri CTE center directors’ perceptions regarding the use of the flipped classroom model within Missouri’s career and technical education centers. Of the 57 Missouri CTE center directors identified for this study, 28 directors responded to the survey over a three-week data collection phase, resulting in a 49.1% response rate (n = 28, N = 57). The study was guided by two research questions: (1) What is the perception of the flipped classroom model on instructional time within career and technical centers? and (2) What is the perception of utilizing the flipped classroom model to enhance skill-based learning within career and technical centers?

The data provided the following results: Per Table 2, 67.86% of CTE center directors indicated they believed the flipped classroom model was a solution for their school to overcome lost instructional time. In addition, Table 3 data suggest that 74.08% of Missouri CTE center directors believed the flipped classroom model would allow students more time for skill-based training at their respective school. Moreover, 60.72% of Missouri CTE center directors indicated
they recognized that lost instructional time was a problem their school was trying to solve through the use of technology (Table 4).

Regarding Research Question Two, 82.14% of Missouri’s CTE center directors indicated they believed the flipped classroom model was a solution for their school to enhance skill-based learning. Per Table 5, two directors (7.14%) viewed the flipped classroom model unfavorably as a strategy to enhance skill-based learning. In addition, 57.14% of the Missouri CTE center directors indicated they believed the flipped classroom model would allow students at their school to develop employable skills such as critical thinking, collaboration, and multi-tasking (see Table 6).

In addition to data that directly addressed Research Questions One and Two, additional data collected provided greater insight regarding CTE center directors’ perceptions on the use of the flipped classroom model within their schools, including whether their faculty had the technological skills to implement the flipped classroom model, and if the directors themselves had the skills to provide flipped classroom professional development. Per the data in Table 7, 78.57% of CTE center directors indicated they believed student learning would be enhanced by allowing students online access to course material and instructional videos prior to skill-based training at their school. However, only 50% of CTE center directors indicated they “strongly agreed” or “somewhat agreed” that their faculty would be successful in using the flipped classroom model. Additionally, only 50% of the CTE center directors indicated they “strongly agreed” or “somewhat agreed” that they possessed the skills to offer professional development in the flipped classroom model for their faculty.
CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to investigate the perceptions of Missouri CTE center directors regarding the use of the flipped classroom model within Missouri CTE centers. This chapter will present a summary of the research, as well as the findings, conclusions, and recommendations for the profession as well as recommendations for further research.

Summary

Overview. This study investigated the perceptions of CTE center directors regarding the use of the flipped classroom model in Missouri’s CTE centers. A current lack of data regarding the instructional strategy within CTE programs necessitated the study.

Two research questions were developed to drive this study:

1. What are CTE center directors’ perceptions of the flipped classroom model on instructional time within CTE centers?
2. What are CTE center directors’ perceptions of utilizing the flipped classroom model to enhance skill-based learning within CTE centers?

Literature Review. The review of literature revealed a lack of information on the subject, which necessitated the study. According to Caughron, career and technical centers face challenges to maximize instructional time while overcoming scheduling obstacles (personal communication, February 5, 2016). Many CTE centers are regionally located causing students to be transported from their home school district to the CTE center, many times residing in a different school district. The daily commute deducts time from the class period where students receive instruction for their career education program. Compounded over the length of the school
year, considerable instruction time is missed. Furthermore, many career and technical centers experience out-of-district (sending) students missing regularly scheduled school days due to scheduled school events at their home school and differing school cancellation schedules.

One strategy to overcome missed instructional time is the flipped classroom model. According to Mok (2014), the flipped classroom model facilitates the learning process in an untraditional way: the teacher delivers lectures in the form of pre-recorded videos while spending class time engaging students in learning activities that involve collaboration and interaction. Bergman and Sams (2013) stated the flipped classroom model enhances learning during class and allows learning to continue after the class period ends; students who miss class because of illness, extra-curricular activities, or the weather still have access to instruction and course content.

Poon (2013) suggested the use of blended learning strategies, like the flipped classroom model, was leading to higher student achievement. Students were achieving higher grades and developing a greater understanding of the course content as a result of these strategies. Du and Wu (2014) stated teachers were designing instruction more effectively with use of blended learning strategies, allowing students to collaborate with their peers and teachers while also receiving greater feedback. Additionally, McLaughlin et al. (2013) stated:

McLaughlin et al. (2013) conducted a study of post-secondary pharmaceutical students participating in a flipped classroom model. The research study compared two consecutive years of data in which two different instructional strategies were used for the same course. The study collected data for students in a traditional lecture-based classroom in 2011, where the teacher lectured within the classroom for 75-minutes followed by 15-minutes of learning activities. In 2012, the study collected data for students where the
flipped classroom model was utilized. Prior to attending class, students viewed self-paced online videos to receive foundational course content. Thereafter, students attended regularly scheduled class periods where they participated in active-learning exercises producing real-time formative assessments facilitated by the instructor. Findings from the student surveys in this study suggested the flipped classroom model greatly enhanced learning (McLaughlin et al., 2013).

**Statement of the problem.** There was no Literature located pertaining the use of the flipped classroom model within CTE centers. Perceptions held by CTE directors regarding the flipped classroom model were also not found. Therefore, the problem driving this study was the lack of perceptual data regarding the use of the flipped classroom instructional approach within Missouri’s CTE centers.

The study was guided by two research questions: (1) What are CTE center directors’ perceptions of the flipped classroom model on instructional time within CTE centers? and (2) What are CTE center directors’ perceptions of utilizing the flipped classroom model to enhance skill-based learning within CTE centers?

**Methodology**

The researcher incorporated a quantitative descriptive research design, using an online survey using SurveyMonkey to collect CTE center directors’ perceptions. The researcher incorporated a census of CTE center directors (lead director) at all CTE centers in Missouri (N = 57).

Prior to data collection, an Exempt level of review application was sought and approved by the University’s Institutional Review Board (IRB). Once IRB approval was obtained, Through the initial data collection phase and an additional follow-up phase, twenty-eight
directors (49.1%) responded to the survey over the three-week data collection phase. Study participants responded to statements indicating their level of agreement regarding the use of the flipped classroom model in career and technical centers.

SurveyMonkey, a web-based survey instrument. The study had a data collection phase was from June 22, 2016 to July 13, 2016 producing a response rate of 49.1% (n = 28, N = 57). Descriptive statistics were selected to investigate the findings within the study. The lack of data regarding the topic led to the study’s purpose.

Findings

The following findings, based on the data collected and analyzed, are presented for this study.

**Research Question One.** When investigating the three survey questions that contributed to Research Question One, the majority of all responses were favorable to the flipped classroom model could make a positive impact on instructional time within CTE centers. When the data from the three survey questions were combined, 56 responses (of the potential 84 responses) or approximately 67%, indicated they strongly agreed or somewhat agreed that the flipped classroom model is a feasible solution for career and technical centers to positively impact instructional time. For those same survey questions, only 13 CTE center directors (or approximately 16%) indicated they disagreed that the flipped classroom could have a positive impact on instructional time. The remaining 17% indicated they “sometimes” thought the flipped classroom model could positively impact instructional time.

**Research Question Two.** When investigating the two survey questions that contributed to Research Question Two, the majority of all responses were favorable to the flipped classroom model making a positive impact on enhancing skill-based learning within CTE centers. When
the data from the two survey questions were combined, 39 responses (of the potential 56 responses) or approximately 70%, indicated they strongly agreed or somewhat agreed that the flipped classroom model was a feasible solution for career and technical centers to positively impact skill-based learning. For those same survey questions, only four CTE center directors (or approximately 16%) indicated they disagreed that the flipped classroom could have a positive impact on skill-based learning. The remaining 23% indicated they “sometimes” thought the flipped classroom model could positively impact skill-based learning.

**Additional Findings**

In addition to the findings based on Research Questions One and Two, the research data provided additional findings that warrant mentioning. These include making resources available online for students to use, assisting faculty

**Online course materials.** While not referring to “flipped classroom” language, CTE center directors were strongly in favor (22 out of 28, 78.57%) for allowing students access to course materials online prior to classroom instruction.

**Faculty member’s technological ability.** Fifty-percent of all CTE center directors who participated in this study indicated they agreed their faculty members have the necessary technological skills to implement a flipped classroom model. Based on these data, there appears to be a need for some faculty to participate in professional development to learn more technological skills related to flipped classroom requirements. However, there also appears there is ample opportunity for technologically literate faculty members to assist their peers in developing these needed skills. A focused, sustained initiative could be implemented that allows faculty to work together in a conscientious effort to help all faculty obtain the required level of technological literacy in this area.
CTE center directors’ abilities to conduct technology-based professional development. One aspect of professional development may be viewed by leadership’s role in endorsing and actually possessing the skills they are requesting of their faculty. According to the data collected and analyzed for this research, 50% of the CTE center directors who participated in this study indicated they believed they had the necessary technological skills to conduct professional development to assist their faculty in implementing a flipped classroom model. Consideration may be encouraged to have the CTE center directors take an active role in flipped classroom professional development, whether the directors are providing the professional development sessions or participating in the professional development sessions along with their faculty. If the latter, the building level leaders could demonstrate they are also willing to learn the required technological skills, thus sending a message they would not be attempting to implement a new initiative without experiencing the same growth as their faculty.

**Discussion of the Findings**

From being in the public school setting for 21 years, the researcher has experiences with CTE centers as both a student and a school administrator. These experiences, combined with conversation with teachers and CTE center directors, led the researcher to believe lost instructional time throughout the school year negatively impacts student achievement. Based on the findings of the study, it may be implied CTE center directors view the flipped classroom model as a solution to improve student achievement for career and technical centers. Caughron stated school cancellations due to weather and coordinating bus schedules (for students to be transported to the CTE centers, then return back to their home sending school) create limitations on quality instructional minutes (personal communication, February 5, 2016). It is the
researcher’s professional opinion that incorporating the flipped classroom model would allow CTE centers to enhance learning by reducing the impact of lost instructional time.

Additionally, implementing the flipped classroom model would allow student access to course content before and after the traditional class period, leaving more time within the class period for learning activities that focus on skill attainment. Based on the researcher’s experiences in education, teachers could facilitate instructional units through a classroom website where students retrieve lesson materials prior to physically attending class in person. This would allow students to have working knowledge of the educational content when they enter classroom. This would allow the teacher to coordinate activities that apply the learning for each student. Furthermore, it is the researcher’s professional opinion the time saved by implementing the flipped classroom model would allow teachers to enhance skill-based learning by providing more repetition and feedback opportunities that lead to skill mastery. After attending class, the teacher could then coordinate learning activities on the classroom website (potentially using blogs and/or discussion boards within their learner management system) where students could reflect on their learning by describing their successes and challenges. Classroom websites offering a discussion board allow students to share their knowledge and experiences with each other, in the author’s professional opinion, making learning collaborative and more impactful.

Though technology (including devices and internet access) is generally more accessible than in previous educational generations, it is still common for Missouri school districts to host students who do not have access to educational technology (or internet access) outside of their home school district or CTE center. This creates a legitimate concern whether the flipped classroom model is an equitable solution for all students. It is the researcher’s professional opinion this challenge can be addressed by creatively using the school library and computer labs
outside of the traditional school day where students are allowed access to technology within an established timeframe. Another possible solution is to provide electronic devices for students to checkout just like they would a library book, but this still may not address the concern of limited internet access outside of the normal school day. If students possess their own portable devices or can check out school district devices for home use, creative teachers can create the learning modules (e.g., presentations, digital documents, videos) and place them on the class website or within the class learner management system which can be downloaded to the devices before students leave school for the day.

It should be noted that anecdotal and empirical data located for this study suggest the flipped classroom model is a popular instructional strategy across education. It is the researcher’s professional opinion the flipped classroom model could be most beneficial for CTE centers compared with other areas of a K-12 school district when considering the challenges of lost instructional time due to differing school schedules, different weather schedules, and transportation time. Additionally, the flipped classroom model could be most beneficial for CTE centers when considering the skill-based content (that is extremely time-intensive to deliver and master) could benefit with additional classroom time if students learn the cognitive-based educational content prior to attending the physical, face-to-face classroom.

Conclusions

This researcher presents the following conclusions based on the data and personal expertise:

1. Career and technical education center directors who implement the flipped classroom model can positively impact student instructional time as evidenced by the perceptual data collected for this study.
2. Career and technical education center directors who implement the flipped classroom model can positively impact skill-based instruction as evidenced by the perceptual data collected for this study.

3. Allowing students to access online materials prior to classroom instruction may increase student learning based on the perceptual data collected for this study. In addition, providing digital materials to students on a school device or their own personal device (especially to those students who may not have access to the internet outside of the normal school day) may help address the “digital divide” that may impact student learning.

4. While many CTE classroom faculty may possess the technological skills to implement the flipped classroom model, some CTE classroom faculty may not possess these technological skills. However, based on the data collected for this study, CTE center directors (or potentially faculty with advanced technological skills and experiences) will be able to provide the required professional development activities for those faculty.

Recommendations for Further Research

The researcher proposed the following recommendations that may drive additional research:

1. Future researchers may consider expanding the focus of research to include a greater population of school administrators and faculty, thus increasing the number of addressing concerns of external validity and overall generalizability of the study.

2. Future researchers may consider could explore travel times for students, the feasibility of implementing the flipped classroom model, and its impact on student learning and achievement.
3. Future researchers may consider further exploring CTE center directors’ actual abilities regarding flipped classroom model and the directors’ comfort level with leading professional development activities that is primarily technology-based.

4. Future researchers may consider investigating the flipped classroom model’s impact on student achievement by comparing end-of-course data (Technical Skill Attainment/Industry Recognized Credential) between a flipped classroom and a traditional classroom.

5. Future researchers may consider capturing the qualitative experiences and perspectives of students who participated in a flipped classroom model. Further research could explore student perceptions on skill attainment due to the flipped classroom model providing a different level of opportunities for skill development and feedback within the traditional face-to-face classroom.
REFERENCES


Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. Eugene, OR: International Society for Technology in Education.


University of Central Missouri (2014). Human subjects process at UCM [Video file]. Retrieved from https://www.ucmo.edu/graduate/human/


Tales from the Flipped Classroom. (2014). *Tech & Learning, 34*(10), 34.


Appendix A

Permission To Conduct Research Using SurveyMonkey
Re: Permission to Conduct Research Using SurveyMonkey

To whom it may concern:

This letter is being produced in response to a request by a student at your institution who wishes to conduct a survey using SurveyMonkey in order to support their research. The student has indicated that they require a letter from SurveyMonkey granting them permission to do this. Please accept this letter as evidence of such permission. Students are permitted to conduct research via the SurveyMonkey platform provided that they abide by our Terms of Use, a copy of which is available on our website.

SurveyMonkey is a self-serve survey platform on which our users can, by themselves, create, deploy and analyze surveys through an online interface. We have users in many different industries who use surveys for many different purposes. One of our most common use cases is students and other types of researchers using our online tools to conduct academic research.

If you have any questions about this letter, please contact us through our Help Center at help.surveymonkey.com.

Sincerely,

SurveyMonkey Inc.
Appendix B

Participant Cover Letter: CTE Administrator Perceptions on Flipped Classrooms
Disclosure

Dear (Director of Career and Technical Center):

My name is Mitch Holder. I am a graduate student at the University of Central Missouri, pursuing an Education Specialist degree in Human Services: Technology and Occupational Education.

For partial requirement for my degree, I am conducting a survey study to compile data regarding the perceptions of CTE administrators’ views on the flipped classroom model within career education programs. It is necessary to evaluate instructional strategies throughout education and CTE’s efforts in making learning more efficient.

If you choose to participate in this study, the data collected will be used to reveal current trends of technology usage within career education programs.

Consistent with Federal guidelines on human subject protection:
1. You must be 18 years of age or older to participate in this study;
2. Your participation in this study is voluntary;
3. Your consent is implied by submitting a survey;
4. There is no penalty for declining to participate;
5. You have the right to withdraw from the study at any time without penalty;
6. Your anonymity will be protected by the research instrument’s design, which will not request any identifiable information;
7. Your confidentiality will be protected should you choose to provide any identifiable information;
8. There are no risks of injury, illness, emotional distress, or loss of privacy;
9. You may contact the University of Central Missouri Research Compliance Official regarding subjects’ rights (Research Compliance Officer, Dr. Janice Putnam; 660-543-4327 or putnam@ucmo.edu)

The survey should take just a few minutes to complete. Regardless of whether you decide to complete the survey or not, thank you for your time and consideration.

Please contact me should you have any questions or concerns regarding the survey study at 816-377-4422 or mholder@trentonr9.k12.mo.us.

Sincerely,

Mitch Holder          Dr. Bart Washer
Graduate Student      Thesis Committee Chair
UCM                   Associate Professor, CTE Administration
816-377-4422          660-543-4580
Appendix C

Human Subjects Consent Letter: CTE Administrator Perceptions on Flipped Classrooms
Informed Consent

Identification of Researcher: This research is being conducted by Mitch Holder, Director of Saline County Career Center and University of Central Missouri graduate student.

Purpose of the Study: The purpose of this study is to compile data regarding usage of the flipped classroom model within career and technical education programs. This study is also being conducted in an effort to evaluate instructional strategies throughout career and technical education.

Request for Participation: I am inviting you to participate in a study regarding instructional strategies in career and technical education. If you decide not to participate, you will not be penalized in any way. You can also decide to stop the survey at any time without penalty. If you do not wish to answer a question, you may simply skip the question. Once you submit an anonymous survey, we will not know which survey or test is yours.

Exclusions: You must be at least 18 years of age to participate in this study.

Description of Research Method: Participation in this study involves participation in completing an online survey about instructional strategies in career and technical education. The survey consists of 19 statements requiring you to respond with your level of agreement or disagreement. This study will take about 2-3 minutes to complete.

Privacy: All of the information collected will be anonymous. We will not record your name, school information, or any identifiable information that could be traced back to you. Your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Explanation of Risks: Participation in this study will not expose participants to risks greater than those encountered in daily life. No compensation will be provided.

Explanation of Benefits: Participants may benefit from the study by gaining firsthand experience in research and by learning from the findings of the study.

Questions: If you have any questions about this study, please contact Mitch Holder by email at mxh21350@ucmo.edu or by calling 816-377-4422. If you have any questions about your rights as a research participant, please contact the Human Subjects Protection Program at 660-543-4624.

Please select the following to indicate your choice for participating in this study:

- Yes, I agree to participate in this study.
- No, I do not want to participate in this study.
Appendix D

Survey: CTE Administrator Perceptions on Flipped Classrooms
Purpose of the Survey

The purpose of the survey is to better understand the use of instructional technology within career education programs. Your answers will be used in aggregate and we will not be evaluating individual responses. As such, please be as honest as possible - there are no right or wrong answers.

For this survey, the flipped classroom model is defined as an instructional approach using technology to connect students with course content outside of the traditional classroom. Thereafter, traditional class time is used for learning activities and formative assessment.

Please respond to each statement only as it pertains to students enrolled at your career and technology center (i.e. area career center, technical school). This survey is not intended to describe the entire school district.

Survey

What are your beliefs about the role of technology in your school?

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Sometimes Agree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My school regularly uses the flipped classroom model to connect students with course material outside of the classroom.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe the flipped classroom model would enhance skill-based learning at my school.</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Faculty at my school have received training on the flipped classroom model.</td>
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</tr>
<tr>
<td>I believe faculty at my school would be successful utilizing a flipped classroom model.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I believe the flipped classroom model is a feasible solution to overcoming lost instructional time for my school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I believe the flipped classroom model would allow students at my school more time in class for skill-based training.

I believe learning would be enhanced at my school by allowing students online access to course material and instructional videos prior to skill-based training.

Lost instructional time due to student absences (school-related or not) is a problem that my school is actively trying to solve through the use of technology.

I believe the flipped classroom model would be successful at my school because students have access to the necessary technology support.

I believe the flipped classroom model would improve student achievement at my school through increased learning efficiency.

Faculty at my school are “tech savvy” enough to effectively implement the flipped classroom model.

I believe the flipped classroom model would improve student motivation.

I believe the flipped classroom model would allow students at my school to experience more skill development.
<table>
<thead>
<tr>
<th>I believe the flipped classroom model would help develop 21st century skills (i.e. multitasking, collaboration, critical-thinking).</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ability for students at my school to access course materials online when they miss school would improve student achievement.</td>
</tr>
<tr>
<td>Lost instructional time is a major problem for my school.</td>
</tr>
<tr>
<td>Students at my school regularly watch instructional videos about course content outside of class specifically to enhance learning by allowing more time in class for skill-based training.</td>
</tr>
<tr>
<td>Students at my school regularly access online discussion boards outside of class specifically to enhance active learning strategies within traditional class time.</td>
</tr>
<tr>
<td>I feel confident in my abilities to lead professional development for my staff regarding the flipped classroom model.</td>
</tr>
</tbody>
</table>
Appendix E

Institutional Review Board (IRB) Application
Title of Research Study: Missouri Career and Technology Administrator Perceptions on Flipped Classrooms Enhancing Learning
Investigator Name: Mitchell Holder
Status (faculty, student, etc): Student
UCM 700#: 700582135
University Email: mxh21350@ucmo.edu
Phone Number: 816-377-4422
URL Link to Survey: https://www.surveymonkey.com/s/9L7ZXZK
Co-Investigators: None
Faculty Advisor and Department: Dr. Bart Washer, Department of Career and Technical Education

☒ By checking this box, I am providing my electronic signature confirming that I have reviewed the application with my advisor and we believe that it is scientifically sound. My advisor has an electronic copy of the application as submitted. My advisor has agreed to:

- Oversee this research by communicating regularly with me;
- Assist with the resolution of any problems or concerns encountered during the research;
- Assure my research complies with Human Subjects Regulations in the Code of Federal Regulations
- Assure that the UCM IRB is notified in the event of an adverse event or protocol deviation.

Failure to work with your advisor as described above will be considered a breach of professional ethics which falls under the academic honesty policy. The consequences of violating standards of academic honesty are extremely serious, costly and may result in the loss of academic and career opportunities.

1. Does this study meet the definition of minimal risk as defined below?
   ☒ Yes
   ☐ No (STOP - A full review is required. Please contact the IRB for additional assistance)

   Minimal risk is defined as follows:

   1. “A risk is minimal where the probability and magnitude of harm or discomfort anticipated in the proposed research are not greater, in and of themselves, than those encountered in daily life or during the performance of routine physical or psychological examinations or tests”.

   2. The research does not involve minors, pregnant women, fetuses, human in vitro fertilization, or prisoners.

   3. The information obtained is not “recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; or any disclosure of the human subject’s responses” would not “reasonably place the subject(s) at risk of criminal civil liability or damaging to the human subject’s financial standing, employability, or reputation.”

2. The project must fall into one of these categories that qualify for exemption:
☐ Normal educational practices in educational settings
☒ Educational tests, surveys, interviews, or public observations where data are not identifiable OR disclosure of responses would not put subjects at risk OR where the subjects are elected/appointed public officials or candidates
☐ Existing data that is publicly available OR researcher records data without identifiers
☐ None of the above (STOP - Please contact the IRB for additional assistance. Other research may be exempt. See website or Federal Policy 45 CFR46.101.)

A summary of your project including the following information is needed to determine exempt status:

1. **Purpose of Your Project:**
   a. What are you trying to find out?
   b. In 500 words or less, summarize the review of literature. *(If this is a replication of a previous study, what is the benefit? Please do not include your thesis proposal.)*

**Summary**

My research study focuses on the lack of perceptual data regarding the use of the flipped classroom model within career and technical education programs. Many career education programs face logistical constraints limiting instructional time. One of these constraints involves transporting students from a sending-school to a regional career center, which ultimately results in a significant amount of lost instructional time throughout a school year.

The use of the flipped classroom model allows students to engage with instructional content outside of a traditional classroom meeting. Students could be watching instructional videos accessible through a classroom website, participating in online classroom chats, and completing online assessments to show understanding within the cognitive learning domain. If the flipped classroom model is used optimally, actual class meeting time can be used more effectively to improve skill-based training within the career education program.

This study will examine how frequently flipped classroom strategies are being utilized within career and technical centers across Missouri. My research study introduces three research questions: (1) what is the perceived impact of the flipped classroom model on instructional time within career and technical centers? (2) what is the perceived impact of utilizing the flipped classroom model to enhance skill-based learning within career and technical centers? (3) what is the relationship between the director’s experience and level of acceptance regarding the flipped classroom model?

**Review of Literature**

The literature review included three areas: Blended Learning, 1:1 Technology Initiatives, and Flipped Classrooms. Blended learning is fundamentally changing instructional design to optimize student engagement (Garrison & Vaughan, 2008). A major benefit is “the access to knowledge that blended learning creates for ‘traditional courses’ combining educational technology delivery methods” (Mortera-Gutierrez, 2006, p. 317). Blended learning has generated more interaction between the student and teacher along with quicker feedback; furthermore, students are achieving higher grades, greater knowledge, and greater understanding of course
content as a result of blended courses (Poon, 2013). Students are able to control their own pace of learning and believe teachers to be more empathetic in blended courses (Poon, 2013).

The rationale behind 1:1 technology initiative is connecting students with new learning opportunities that go beyond the walls of the classroom (Hatakka & Andersson, 2013). One-to-one initiatives have been found to increase curiosity, excitement, and collaboration for students in the classroom; furthermore, students are motivated to learn and understand the effectiveness of using technology (Maninger & Holden, 2009). “Early results of 1:1 initiatives suggest improvements in student writing skills, motivation and engagement in learning, and development of 21st century skills, including project development, and research and communication” (Topper & Lancaster, 2013, p. 348).

In a flipped classroom, “the learning process is done the other way around: the teacher ‘delivers’ lectures before class in the form of pre-recorded videos, and spends class time engaging students in learning activities that involve collaboration and interaction” (Mok, 2014, p. 7). Students are accessing course content as consumers, learning from online videos and resources at their own speed and when needed (“Tales from the Flipped Classroom,” 2014). Students benefit from watching online videos at home because they can fast-forward through sections of the lecture they understand or stop and review areas they are having difficulty (Goodwin & Miller, 2013). McLaughlin et al. (2013) performed a study investigating student perceptions within a post-secondary course where the flipped classroom model was implemented. This study supported “the belief that learning key foundational content prior to coming to class greatly enhanced in-class learning (McLaughlin et al., 2013, p. 1).” Through the flipped classroom, traditional class time is used for active learning strategies, translating to higher-order thinking skills. Allowing students to participate in active learning strategies such as analysis, evaluating, and creating is to enhance the learning process to better understanding (Roehl et al., 2013).

The Flipped Learning Network (2012) performed a survey of 453 teachers who have implemented the flipped classroom. Ninety percent of the teachers report they would use the flipped classroom again. The survey reports 80 percent of the classrooms saw improved student attitude while 67 percent reported improved test scores. Science and Math were the most common subjects where the flipped approach was utilized. The flipped classroom particularly benefited advanced placement and at-risk students (“Improve Student Learning,” 2012).

2. Selection of Subjects:

(Ensure that the responses on this section match the consent form)

a. Describe demographic characteristics
b. What are the selection criteria?
c. Number of subjects
d. Time frame that the subjects should expect to participate (e.g. two hours or two sessions of two hours)
e. Explain the procedure to be used to recruit and select research subjects
f. Include a copy of the flyer or exact wording used in emails, texts or verbally
g. Describe any compensation for participation.

Selection of Subjects
The subjects participating in this study will come from certified directors employed for the 2015-2016 school year at career and technology centers in the state of Missouri. The state currently has 57 career and technical centers. The survey will be sent to 57 subjects. The subjects can expect to spend 3 to 5 minutes completing the survey.

I will contact MCCTA Executive Director Bob Larivee to gain permission on the use of the email list for directors across the state of Missouri. I will use the email addresses provided from this list to email the administrators asking for participation in my research study. None of the subjects participating in the study will be compensated. Wording to be used within the emails will state:

Dear (Director of Career and Technical Center):

My name is Mitch Holder. I have been hired as the new Director of the Saline County Career Center in Marshall, MO. I am conducting a survey study to learn more about instructional practices within CTE and the hope to discover strategies to make learning more effective for CTE classrooms.

I am a graduate student at the University of Central Missouri, pursuing an Education Specialist degree in Human Services: Technology and Occupational Education. For partial requirement for my degree, I am conducting a survey study to compile data regarding the perceptions of CTE administrators’ views on the flipped classroom model within career education programs.

If you choose to participate in this study, the data collected will be used to reveal current trends of technology usage within career education programs.

Consistent with Federal guidelines on human subject protection:
1. You must be 18 years of age or older to participate in this study;
2. Your participation in this study is voluntary;
3. Your consent is implied by submitting a survey;
4. There is no penalty for declining to participate;
5. You have the right to withdraw from the study at any time without penalty;
6. Your anonymity will be protected by the research instrument’s design, which will not request any identifiable information;
7. Your confidentiality will be protected should you choose to provide any identifiable information;
8. There are no risks of injury, illness, emotional distress, or loss of privacy;
9. You may contact the University of Central Missouri Research Compliance Official regarding subjects’ rights (Research Compliance Officer, Dr. Janice Putnam; 660-543-4327 or putnam@ucmo.edu)

The survey should take just a few minutes to complete. Regardless of whether you decide to complete the survey or not, thank you for your time and consideration.

Please contact me should you have any questions or concerns regarding the survey study at 816-377-4422 or mholder@trentonr9.k12.mo.us.
Sincerely,

Mitch Holder
Graduate Student
UCM
816-377-4422

Dr. Bart Washer
Thesis Committee Chair
Associate Professor, CTE Administration
660-543-4580

3. Procedure for obtaining informed consent:
   a. Who will obtain the consent
   b. Where will this be done
   c. When will this be done
   d. Include the consent form from the templates on the website (If you are asking for a modified consent or waiver of consent, a justification of this must be supplied.)

Each survey participant will indicate consent at the beginning of the survey. The question is asked, “Do you give consent to participate in this research study?” The two potential responses are: (1) I give my consent to participate in this study and (2) I do not give consent to participate in this study.

4. Data Collection:
   a. Describe where the data will be collected
   b. Include written permission to collect data at that site (A template to request written permission is on the website.)
   c. Attach all:
      i. Questionnaires or surveys
      ii. Interview schedules
      iii. Flowcharts, etc.

Data Collection
The data will be collected from Survey Monkey, a survey-generating website. A URL link (https://www.surveymonkey.com/s/9L7ZXZK) will be emailed to certified directors currently employed at career and technical centers across the state of Missouri. This link will give the participant access to the survey. Once participants complete the survey, data analysis will be configured on Survey Monkey.

5. Research Procedures and Risk to Subjects:
   a. What will the subject be asked to do?

Research Procedures and Risk to Subjects
The subject will be asked to complete a survey, which contains a series of statements. The survey participant will respond to the questions based on use of technology within their own area career center.

The subjects will not be exposed to risks greater than those encountered in daily life; therefore, minimal risk is associated with completing this survey. The risk/benefit assessment of this research study will not exceed minimal risk for participants while potentially benefiting
career education programs for integration of instructional technology.

b. Risks/Benefit Assessment
   i. Risk involved:
      ☒ Economic
      ☑ Legal
      ☒ Physical
      ☐ Psychological
      ☐ Social
      ☒ Other – Potentially Improved Usage of Instructional Technology within CTE
      ☐ None
   ii. Describe the level of risk:
      ☒ Minimal*
      ☐ Greater than Minimal Risk
      *Note: Minimal Risk means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves that those ordinarily encountered in daily life or during the performance of routine or physical or psychological examinations or tests.

c. Does the study design minimize the risks?
   ☒ Yes
   ☐ No
   Note: Risks to subjects are minimized: 1) by using procedures which are consistent with sound research design and which do not unnecessarily expose subjects to risk or 2) whenever appropriate, by using procedures already being performed on the subjects for diagnostic or treatment purposes.

   If No, address the conditions for approval:
   i. Benefits to the subject?
      ☐ Direct
      ☐ Indirect
      ☐ Both
      ☐ None
   ii. Are there societal benefits?
      ☐ Yes
      ☐ No
   iii. Are the risks to subjects reasonable in relation to direct anticipated benefits (if any) to subjects, and the importance of the knowledge that may reasonably be expected to result?
      ☐ Yes
      ☐ No
      Note: Consider physical, psychological, social, legal and economic risks. Is the research likely to achieve its proposed aims? Is the importance of the aims clear?

d. Describe any compensation for harm to research subjects:
   ☐ Economic
   ☐ Legal
6. **Consent and Data Management Plan:**
   a. Describe the specific data that will be recorded.

   Three guiding questions to the research study will lead the survey responses: (1) Are elements of the “flipped classroom model” being used within your area career center?; (2) Are strategies being implemented within your area career center to increase learning efficiency during the scheduled class period?; and finally, (3) Has professional development incorporated elements of the “flipped classroom model” into your area career center?

   For each question, 5-6 statements are presented where the survey participant will respond to a Likert 5-point scale. The 5-point scale has the responses of: always, almost always, sometimes, almost never, never.

   b. How will the consents and data be secured?
      - [ ] Locked in a cabinet or office
      - [X] Password secured PC, thumb drive or laptop
      - [ ] Encrypted when transmitted
      - [ ] Other - explain:

   c. Does this data pose more than minimal risk?
      - [X] No
      - [ ] Yes
      If yes, describe how you will monitor the data to ensure the safety of subjects

   d. Method of destruction of consents and data:
      - [X] Erase from computer, audio tapes and/or videos
      - [ ] Shred paper documents
      - [ ] Other - explain:

7. **Privacy of Subjects:** (*On the consent form, the privacy description must match this response.*)
   a. Explain how privacy will be assured or why the subjects would not be at risk if their identity were accidentally disclosed.

   The data will not reveal identifiable information. The data collection will be anonymous and also described in the aggregate. Data results will be password protected and deleted after the completion of the study.

   Data collection is:
      - [X] Anonymous – no direct contact with subject or identity
      - [ ] Confidential – direct contact with subject or identity
Data analysis is:
☒ Anonymous or de-identified
☐ Coded (with link to identify)
☐ Identified

8. Funded Research
   a. ☒ No
   b. ☐ Yes

If yes, address financial conflict of interest and congruence with grant application
   i. Is there a completed FCIO on record in the Office of Sponsored Programs?
      1. ☐ No
      2. ☐ Yes

   ii. Identify any external funders of the study.
   iii. Provide copy of grant application
Appendix F

IRB Approval Letter: CTE Administrator Perceptions on Flipped Classrooms
Dear Mitchell Holder:

Your research project, 'Missouri Career and Technology Administrator Perceptions on Flipped Classrooms Enhancing Learning', was approved by the University of Central Missouri Human Subjects Review Committee on 5/20/2016.

**If an adverse event (such as harm to a research participant) occurs during your project, you must IMMEDIATELY stop the research unless stopping the research would cause more harm to the participant. If an adverse event occurs during your project, notify the committee IMMEDIATELY at researchreview@ucmo.edu.**

The following will help to guide you. Please refer to this letter often during your project.

- If you wish to make changes to your study, submit an “Amendment” through Blackboard under the “Amendment and Renewals” tab. **You may not implement changes to your study without prior approval of the UCM Human Subjects Review Committee.**

- If the nature or status of the risks of participating in this research project change, submit an “Amendment” through Blackboard under the “Amendment and Renewals” tab. **You may not implement changes to your study without prior approval of the UCM Human Subjects Review Committee.**

- **When you have completed your collection of data, please submit the “Final Report” found on Blackboard under the “Final/Renewal Report” tab.**

If you have any questions, please feel free to contact me at researchreview@ucmo.edu.

Sincerely,

[Signature]

Deborah J. Tumbow  
Director, Sponsored Programs  
University of Central Missouri

cc: mxh21350@ucmo.edu  
Protocol Number: 507
Appendix G

Email to CTE center directors – Survey Announcement
From: Mitchell Holder <mxh21350@ucmo.edu>
Date: June 22, 2016 at 10:44:50 AM CDT
To: Bob Larivee <mccta10@gmail.com>
Subject: Re: Holder: UCM Research Project for Directors

I have sent the survey out to all directors. Thanks again for your help with this!

Mitch

On Tue, Jun 21, 2016 at 5:10 PM, Bob Larivee <mccta10@gmail.com> wrote:

Good afternoon Directors!

Please see the request below by Mitch Holder for your commitment to complete the survey monkey for him. His research can help each of us, so I encourage you to take a few minutes to complete his survey. Mitch will be sending you via an email!
For those of you who will be leaving at the end of June, please take care of this before you move on to your new adventures!
Thanks,
Bob

-------- Forwarded message --------
From: Mitchell Holder <mxh21350@ucmo.edu>
Date: Tue, Jun 21, 2016 at 2:20 PM
Subject: Holder: UCM Research Project for Directors
To: Bob Larivee <mccta10@gmail.com>

Bob,

My name is Mitch Holder and I've been hired as the new director for the Saline County Career Center in Marshall, MO. I am currently working on research for my degree through UCM and with the hope to share my findings with other directors across the state regarding technology usage in career centers.

I will be emailing directors through Survey Monkey within the week. Naturally, with research, the more participants taking part in the survey will give us a better insight into the use of technology throughout career and technical centers in Missouri. So, if you could help me encourage directors to open my email and take the 2-3 minute survey, I would really appreciate it!

Thank you for your assistance!

Mitch Holder
Director
Saline County Career Center
Appendix H

Data Analysis by Survey Question
<table>
<thead>
<tr>
<th></th>
<th>STRONGLY DISAGREE</th>
<th>SOBERLY DISAGREE</th>
<th>SOMETIMES</th>
<th>SOMEWHA</th>
<th>STRONGLY AGREE</th>
<th>TOTAL</th>
<th>WEIGHTED AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>My school regularly uses the flipped classroom model to connect students with course material outside of the classroom.</td>
<td>25.00% 7</td>
<td>17.66% 5</td>
<td>25.00% 7</td>
<td>25.00% 7</td>
<td>7.14% 2</td>
<td>28</td>
<td>2.71</td>
</tr>
<tr>
<td>I believe the flipped classroom model would enhance skill-based learning at my school.</td>
<td>3.57% 1</td>
<td>3.57% 1</td>
<td>10.71% 3</td>
<td>53.57% 15</td>
<td>28.57% 8</td>
<td>29</td>
<td>4.00</td>
</tr>
<tr>
<td>Faculty at my school have received training on the flipped classroom model.</td>
<td>14.29% 4</td>
<td>50.00% 14</td>
<td>14.29% 4</td>
<td>17.86% 5</td>
<td>3.57% 1</td>
<td>28</td>
<td>2.46</td>
</tr>
<tr>
<td>I believe faculty at my school would be successful utilizing a flipped classroom model.</td>
<td>0.00% 0</td>
<td>7.14% 2</td>
<td>42.86% 12</td>
<td>42.86% 12</td>
<td>7.14% 2</td>
<td>28</td>
<td>3.50</td>
</tr>
<tr>
<td>I believe the flipped classroom model is a feasible solution to overcoming lost instructional time for my school.</td>
<td>3.57% 1</td>
<td>10.71% 3</td>
<td>17.86% 5</td>
<td>53.57% 15</td>
<td>14.29% 4</td>
<td>28</td>
<td>3.04</td>
</tr>
<tr>
<td>Question</td>
<td>%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>14</td>
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<td>---</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>I believe the flipped classroom model would allow students at my school more time in class for skill-based training.</td>
<td>3.70%</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td></td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>I believe learning would be enhanced at my school by allowing students online access to course material and instructional videos prior to skill-based training.</td>
<td>3.57%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Lost instructional time due to student absences (school-related or not) is a problem that my school is actively trying to solve through the use of technology.</td>
<td>7.14%</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td></td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Statement</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td>13</td>
<td>0</td>
<td>28</td>
<td>3.18</td>
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<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>------</td>
</tr>
<tr>
<td>I believe the flipped classroom model would be successful at my school because students have access to the necessary technology support.</td>
<td>3.57%</td>
<td>21.43%</td>
<td>28.57%</td>
<td>46.43%</td>
<td>0.00%</td>
<td>28</td>
<td>3.18</td>
</tr>
<tr>
<td>I believe the flipped classroom model would improve student achievement at my school through increased learning efficiency.</td>
<td>3.57%</td>
<td>3.57%</td>
<td>32.14%</td>
<td>60.71%</td>
<td>0.00%</td>
<td>28</td>
<td>3.50</td>
</tr>
<tr>
<td>Faculty at my school are &quot;tech savvy&quot; enough to effectively implement the flipped classroom model.</td>
<td>3.57%</td>
<td>32.14%</td>
<td>32.14%</td>
<td>25.00%</td>
<td>7.14%</td>
<td>28</td>
<td>3.00</td>
</tr>
<tr>
<td>I believe the flipped classroom model would improve student motivation.</td>
<td>3.70%</td>
<td>3.70%</td>
<td>89.56%</td>
<td>23.83%</td>
<td>3.70%</td>
<td>27</td>
<td>3.26</td>
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<tr>
<td>Statement</td>
<td>3.57%</td>
<td>0.00%</td>
<td>25.00%</td>
<td>57.14%</td>
<td>14.29%</td>
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<td>3.79</td>
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<td>--------</td>
<td>--------</td>
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</tr>
<tr>
<td>I believe the flipped classroom model would allow students at my school to experience more skill development.</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>18</td>
<td>4</td>
<td>28</td>
<td>3.79</td>
</tr>
<tr>
<td>I believe the flipped classroom model would help develop 21st century skills (i.e., multitasking, collaboration, critical-thinking).</td>
<td>3.57%</td>
<td>3.57%</td>
<td>35.71%</td>
<td>50.00%</td>
<td>7.14%</td>
<td>2</td>
<td>3.54</td>
</tr>
<tr>
<td>The ability for students at my school to access course materials online when they miss school would improve student achievement.</td>
<td>3.57%</td>
<td>3.57%</td>
<td>21.43%</td>
<td>60.71%</td>
<td>10.71%</td>
<td>3</td>
<td>3.71</td>
</tr>
<tr>
<td>Lost instructional time is a major problem for my school.</td>
<td>3.57%</td>
<td>14.29%</td>
<td>39.29%</td>
<td>17.86%</td>
<td>25.00%</td>
<td>7</td>
<td>3.46</td>
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<td>Question</td>
<td>14.2%</td>
<td>50.0%</td>
<td>17.8%</td>
<td>17.8%</td>
<td>0.0%</td>
<td>Total</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Students at my school regularly watch instructional videos about course content outside of class specifically to enhance learning by allowing more time in class for skill-based training.</td>
<td>4</td>
<td>14</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>28</td>
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<th>25.0%</th>
<th>46.4%</th>
<th>28.0%</th>
<th>3.5%</th>
<th>0.0%</th>
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<td>Students at my school regularly access online discussion boards outside of class specifically to enhance active learning strategies within traditional class time.</td>
<td>7</td>
<td>13</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>28</td>
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<tr>
<th>Question</th>
<th>3.5%</th>
<th>17.8%</th>
<th>25.5%</th>
<th>42.8%</th>
<th>7.1%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel confident in my abilities to lead professional development for my staff regarding the flipped classroom model.</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>12</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>3.32</td>
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<td></td>
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