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Comparing the Effectiveness of Flipped Classroom and Traditional Classroom Student Engagement and Teaching Methodologies

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Michael T. Holik

Signature: *Michael T. Holik*   Date: 3-23-16

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Abstract

Studies exist on the effectiveness of learning in a flipped classroom learning setting; however, there is limited research available regarding the success or failure rates of flipped classroom learning in technical culinary arts programs. This study, using an action-based research approach, was designed to gather evidence from a technical education program to determine if students perform better in the flipped classroom or traditional classroom. Multiple instruments were designed to gather information about the culinary flipped classroom format. Instructor and student perceptions about the learning in each type of classroom were explored, levels of student engagement were recorded, and final course grades for the culinary classroom were gathered. Perceptions of the students and instructor indicated engagement in the flipped classroom were higher in the flipped classroom than the traditional classroom. The analysis of final course grades did not indicate a significant difference between the two teaching formats. While the focus of the study was on one culinary arts technical education program and cannot be generalized to other technical education programs, future research suggestions included conducting studies where the data are disaggregated to provide more specific answers. In addition, the suggestion was made to conduct further studies using more traditional research methods such as quantitative, qualitative, and mixed methods.

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Chapter One: Introduction

In classrooms today, many teachers are using different strategies to increase engagement of their students (Bergmann & Sams, 2012). The flipped classroom teaching modality is one method of instruction, which can, if designed correctly, change a traditional classroom from teacher-centered to student-centered (Aronson, 2013; Bergmann & Sams, 2012). In student-centered classrooms, students do not progress to the next unit until they have mastered the current one (Bergmann & Sams, 2012). In a typical flipped classroom, students learn the lecture material through short, digital lessons outside the classroom, and spend their time in class actively engaged in meaningful, hands-on application of the material learned prior to class (Talbert, 2012).

Fickes (2014) elucidated, the digital age has allowed the flipped classroom format to surface as a viable resource. Digital tools such as smartphones, computers, and the internet, all major components of modern instructional technology, have made it possible for teachers to flip their classrooms (Fickes, 2014). While the resources are in place in many learning institutions, determining if students have consistent access to required technology outside of class is necessary to the implementation of the flipped classroom (Fickes, 2014). Additionally, Tucker (2013) purported the use of digital technologies in school, and other aspects of society today, have made it easier for students to comprehend concepts taught in the classroom. Although accessibility of technology is important, it is not the only focus of the flipped classroom and this study; measuring student engagement between teaching modalities is also necessary (Aronson, 2013).

Background of the Study

Ullman (2013) stated the design and premise of flipped classroom learning has changed the format of many classrooms. Ullman (2013) noted the simplest explanation of flipped classroom learning is students spending their time actively engaged with each other and the instructor, working on assignments, projects, assessments, and other activities, based on the material they pre-learned to class. However, Tucker (2012) purported the flipped classroom is decades old. Regardless of how long this modality has been in existence, the need to increase academic success and student engagement has made the flipped classroom a popular trend across the country (Tucker, 2012). The availability and accessibility of modern technology has been a vessel to mainstream the flipped classroom in schools (Fickes, 2014).

Jukes, McCain, Crockett, and Prensky (2010) stated to engage current generation students, the gap between traditional, teacher-led classrooms and the age of the digital classroom must be closed. In agreement, DeGennaro (2008) noted a large part of student learning comes from social interactions, many of which incorporate the use of the technology. Being able to reach students through the technology they use on a daily basis may actually create higher levels of student engagement (Jukes et al., 2010).

Bringing technology devices students rely on for social reasons into the classroom may also increase student participation and achievement (DeGennaro, 2008). Jukes et al. (2010) noted the importance of adapting classrooms to meet the learning needs of modern day students rather than continuing to teach to needs of students of generations past. Just as the way student learning evolves over time, the classroom needs to evolve by incorporating technology (Jukes et al., 2010).

By incorporating technology, the implementation of the flipped classroom attempts to appeal to contemporaneous teachers who flip the traditional lecture style classroom upside down by administering lectures digitally outside of class and thereby create an active and engaging student-centered learning environment during class (Ng, 2014). According to Ullman (2013), a misperception exists in regards to the flipped classroom, as it may be thought of as a teaching modality uniform in delivery no matter the subject, when in reality there is not a one-size fits all format for all subjects taught. Barker (2013) provided an example of one flipped method used in a high school chemistry course where in-class work was balanced with outside class preparation. Students in the chemistry class came already prepared by watching pre-recorded, digital lessons delivered through different forms of technology (Barker, 2013). In the case of this science course, once students arrived in class, the professor used class time for questions and answers, evaluation of students understanding of the lesson material, and used actual application of the material (Barker, 2013).

Theoretical Framework

The main theory that guided this research study was based on Howard Gardner's learning theory of multiple intelligences (MI) (Gardner, 2011). Unlike in the past, with intelligence tests such as Stanford-Binet Intelligence Scale or Wechsler Adult Intelligence Scale, which only measured cognitive intelligence (Becker, 2003; Cherry, 2014), Gardner's (2011) theory expanded the definition of intelligence to cover more than just intellectual measurements of ability and included other areas of strengths a person possesses. As noted by Becker (2003), the Stanford-Binet Intelligence Scale is

used to measure cognitive abilities and intelligence in children and adults and measures

short-term memory, verbal reasoning, quantitative reasoning, and abstract-visual

reasoning (Becker, 2003). The Wechsler Intelligence Scale is used to measure only

performance and verbal abilities (Cherry, 2014). Both the Stanford-Binet and the

Wechsler measure strengths and weaknesses of cognitive intelligence (Becker, 2003;

Cherry, 2014).

Gardner (2011) defined intelligence as having the ability to acknowledge

problems in multiple environments and determine the best way to solve and test those

problems. Gardner (2011) defined intelligence as inclusive of cultural development and

encompassing of a multitude of different educational settings. By examining the

creativity of humans and the best ways to cultivate creativity, along with the different

dimensions of the way people learn, Gardner (2011) derived multiple intelligences.

Gardner (2011) studied different bodies of scientific evidence including natural

development, organization of the brain, evolution, and the analysis of the body. As more

research was conducted, the number of identified intelligences grew (Gardner, 2011). As

of 2016, Gardner (2011) has nine identified intelligences.

Gardner (2011) also explored the application of multiple intelligences theory in

the classroom. Intelligences are communicated through tasks, disciplines, domains, and

spatial intelligence such as observing a child putting together a puzzle, playing with

blocks, or passing a ball (Gardner, 2011). Additionally, diversity of all types of

intelligences and the process of how they develop were studied (Gardner, 2011).

The focus of this study was on the implementation of the flipped classroom. To serve as a guide, four of Gardner's multiple intelligences were applied: bodily-kinesthetic, visual-spatial, mathematical-logical, and interpersonal (Gardner, 2011; Kagan & Kagan, 2014). Bodily-kinesthetic intelligence may be fostered in the flipped classroom through hands-on activities in lab projects, role-playing, and participating in job skills training (Chapman, 2014). Visual-spatial intelligence may be utilized through the use of creating a new business and visualizing all the components including facilities, furnishings, marketing, advertising, landscaping, and organization activities (Guignon, 2014).

Guignon (2014) and Chapman (2014) reported students who use mathematical-logical intelligences in the flipped classroom have natural talent in solving mathematical problems. Kagan and Kagan (2014) posited students learn through interpersonal intelligences in the flipped classroom on a daily basis, and interpersonal intelligence is overt to the observer. Interpersonal intelligences reference the way students relate to each other, how they communicate and cooperate with each other during in-class activities, and use body language and facial expressions to interpret moods of fellow students (Gardner, 2011; Kagan & Kagan, 2014).

DeGannaro (2008) and Hendricks (2013) supported Gardner and Kagan's theories through exploration of social interaction and stated part of student development often occurs in the classroom in social dimensions and personal situations. Socially engaged students have been proven to be more successful both in personal development and the ability to situate and generalize learning (Hendricks, 2013).

Statement of the Problem

Many studies involving the flipped classroom focus primarily on general education at the secondary level (Bergmann & Sams, 2012; Flumerfelt & Green, 2013). There is a gap however, regarding the use of the flipped classroom at the post-secondary level, specifically in technical programs such as in Culinary Arts. Because of this void, it is difficult to determine if the flipped classroom would be an appropriate teaching modality for such technical programs. With the majority of research targeting the secondary high school level, the question remains whether the flipped classroom is a teaching modality adaptable to be a teaching strategy in post-secondary classrooms.

Purpose of the Study

The purpose of this study was to gather evidence from a technical education program to determine if students perform better in the flipped classroom or traditional classroom. Student perceptions about the learning in each type of classroom were also explored. The information gathered from this study was used to help determine the effectiveness of the flipped classroom. Data from this study may provide information to allow instructors to determine whether to proceed with the flipped classroom or return to the traditional teaching modality. While this study focused specifically on one Culinary Arts technical education program and cannot be generalized to other technical education programs, the study could be considered for future, more structured studies with the ability to impact beyond one classroom.

The task of implementing the flipped classroom and evaluating the effectiveness, or lack thereof, took place through action research. The researcher was also a participant

in the study, which allowed him to improve teaching practices in the classroom

(Hendricks, 2013).

Research questions. The following research questions guided the study:

1. How does the level of engagement, as measured by the engagement rubric, differ for students in a traditional culinary arts technical classroom, as compared to students in a flipped culinary arts technical classroom?

2. How does the role of the teacher change, if at all, in a flipped culinary arts technical classroom in comparison to the role of the teacher in a traditional culinary arts technical classroom?

3. What perceptions do students in a culinary arts technical flipped classroom possess in regards to their learning?

4. What aspects do students in a culinary arts technical program report as support or as potential barriers for their learning in the culinary arts technical flipped classroom?

5. What differences exist, if any, in student academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical classroom, as measured by end of course grades?

H5o: There is no statistically significant difference in academic performance in a traditional culinary arts technical education classroom, compared to students in a flipped culinary arts technical classroom as measured by end of course grades.

H5a: There is a statistically significant difference in academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical education classroom as measured by end of course grades.

Definition of Terms

For the purposes of this study, the following terms are defined:

Action research. A methodical progression of investigation allowing the researcher to participate in multiple roles within the study (Sagor, 2011). Action research is also designed to support the cultivation or fine-tuning of instructional practice (Sagor, 2011).

Cooperative learning. Teaching methodology where students work together in diversely mixed groups to solve problems, explore and create projects, or other academic activities, while teachers facilitate the learning environment (Felder & Brent, 2007). During this time, students are able to not only develop their teamwork skills, but develop their own learning style as well (Felder & Brent, 2007).

Culinary arts. The art and theory of working with sweet and savory food concepts with demonstrations by chefs and hands-on practice (International, 2015).

Flipped learning. An instructive methodology where the individual learning environment is changed into a shared group-learning environment, which creates an academically engaged learning environment for students to practically apply prior learned knowledge in a controlled environment, monitored and facilitated by a teacher (Estes, Ingram, & Liu, 2014). Instructive methodology also transforms the traditionally rigid structured classroom into a flexible culture of learning and intentional content (Estes et al., 2014).

Flipped or inverted classrooms. Classrooms which utilize instructional methodology where students complete projects, homework, and activities during class-

time and view lecture material outside of class-time, reversing a traditional classroom environment (Talbert, 2012).

Intentional content. The act of using psychological common sense and pragmatism of normal language; to think or speak about an object (Spear, 2011). Intentional content is also being able to use memories, knowledge, and experiences to give a person the ability to see the value of presenting things in different ways (Spear, 2011).

Student-centered learning. The type of learning that occurs when the focus of the lesson is shared equally between students and teachers (Concordia, 2012). In a student-centered environment, in-class activities, group work, and quality exchanges between the students and teachers are encouraged (Abbott, 2014)

Teacher-centered learning. The type of learning that occurs when the instructional model forces students to remain focused primarily on the teacher (Concordia, 2012). Students listen to lectures with the teacher as the primary source of information (Concordia, 2012).

Technical education. On-the-job vocational and academic training for students involving science and technology (Abbott, 2014). Contains objectives allowing students to learn job skills through practical application and theory of specific technically skilled work fields (Abbott, 2014).

Theory of multiple intelligences. A theory allowing people to teach and understand components of learning styles, human intelligence, personalities, and human behavior in educational and industry settings (Gardner, 2011).

Traditional teaching. The traditional organization of a classroom where the teacher teaches from the front of the classroom, students' desks are in rows, and the learning is focused on the teacher (Donnelly, 2014).

Visions. For the purpose of this study, visions are a way for teachers to improve their teaching methodology allowing them to teach to multiple learning styles and close the gap between teacher lessons and student comprehension (Kagan & Kagan, 2014).

Limitations and Assumptions

The following limitations were identified in this study:

Sample demographics. The sample for this study was high school students participating in a culinary arts technical education program at a Missouri community college. Although the sample was compiled of students from multiple area high schools who are transported to the college, the entire sample attended the same program at one college, which placed limits due to the program specific nature of the study.

Instrument. This study included multiple instruments for collecting data. A survey was used at the beginning of the study to determine whether students had the technology available outside of class to participate in the flipped classroom. The data collection instrumentation included scoring guides for observations, interview protocol, and journaling.

The scoring guides were a limitation because the instruments were created by the researcher and were specific only to the culinary arts technical education program at the Missouri community college included in this study. Therefore, results may not generalize to other programs. Standardized scoring guides were available for this type of observational data; however, none specific to the type of program studied were found.

The researcher-created scoring guides were established as a scoring system to provide more credibility to the data during daily, in-class, student observations.

Journaling was the last instrument used to gather data for the study and was considered a limitation, because all journal entries were entered by the researcher and were only specific to the culinary arts technical education program at the community college and the researcher. Journaling is an effective way for teachers to "collect and evaluate both affective and behavioral information" (Hendricks, 2013, p. 96). The researcher created a journaling schedule, which included pre-class entries, during-class entries, and reflective entries at the end of each class. The researcher journaled for 16 weeks in the fall semester of 2015.

Researcher reliability. Reliability of data collection in action research requires a conscious effort to remain objective (Hendricks, 2013; Herr & Anderson, 2015: Sagor, 2011). The researcher in this study strived to remain unbiased throughout the study regardless of playing a dual role as a participant. In order to support the data collection process and strengthen the findings, the researcher consulted with an educational research professional and reviewed the collected data each week during the study.

The following assumptions were accepted:

1. The participants were able to withdraw their consent to participate in the study at any time, without penalty.

Summary

While general information on flipped classroom learning exists, research regarding the implementation into a culinary arts technical education classroom was lacking. The purpose of this study was to determine if it is feasible and worthwhile to

implement the flipped classroom into technical programs. In this chapter, the background of the flipped classroom was discussed. The theoretical framework based on Howard Gardner's work was presented. In this study, only four of Gardner's (2011) identified learning styles, which aligned most with flipped classroom learning in a culinary arts technical education program, were used.

The research questions, both qualitative and quantitative in nature, were presented and were vital components in this action research project (Herr & Anderson, 2015). The questions were designed to gather information regarding the differences in level of engagement and academic success for students in both the traditional and flipped classrooms. Other questions were designed to collect data about the role of the teacher and how, if at all, his role changes. Lastly, student perceptions regarding their learning and barriers they encountered during their learning in the flipped classroom were explained in this chapter.

In Chapter Two, an extensive review of literature is presented. The first section is designed to expand the theoretical framework and provide details regarding multiple intelligences in regards to flipped classroom learning. Also presented is the history of flipped classroom, where it gained popularity, and where it had evolved by 2016. The information in Chapter Two includes an outline, statistics, and benefits of the flipped classroom to help create an appropriate foundation for the study.

Finally, multiple types of technology used in the flipped classroom are outlined in the chapter, as well as different cost options for each. A depiction of the roles of parents and teachers is included in the following section to help answer questions of how their duties and involvement in the flipped classroom changes, if at all. Lastly, in order to

provide a non-biased approach to the study, challenges and misconceptions of the flipped

classroom are presented.

Chapter Two: Review of Literature

The theoretical framework for this study was focused on multiple intelligence theories from well-known theorists; Gardner, (2011) and Kagan and Kagan, (2014). As noted by Reece (2002), "Harvard psychologist Howard Gardner formulated a theory of multiple intelligences that revolutionized our way about learning and teaching" (p. 20). After a solid foundation for this study is presented, the remaining chapter will be divided into three sections.

Foundations of the flipped classroom and explanations of the differences between a traditional learning environment and a flipped classroom are outlined in this chapter. Furthermore, the benefits, costs, and technology associated with the flipped classroom are also included. Perceptions of teachers, students, and parents involved with the flipped classroom are elucidated, and the information presented in this chapter clarifies the need and significance for conducting this study.

Theoretical Framework

Although there are multiple theories to support this study, Gardner's theory of multiple intelligences (1983) was the main source driving the research. Gardner's (2011) work with MI has given academia a different perspective on intellectual ability. Gardner attended Harvard to study the psychology, anthropology, and sociology of social relationships in humans and in 1967 co-founded a study focused on human creativity and artistic ability known as "Project Zero" (Chapman, 2014, p. 1), which would later create the foundation for Gardner's MI theories (Chapman, 2014). In 1983, Gardner wrote and published, *Frames of Mind*. In this work, Gardner (2011) posited human learning is a combination of capabilities and skills, and these factors can be used to help determine a

person's strengths, weaknesses, and personality. Gardner (2011) studied "prodigies, gifted individuals, brain-damaged patients, idiot savants, normal children, normal adults, experts in different lines of work, and individuals from diverse cultures" (p. 9).

Gardner's early work was focused around six different areas of intelligences, but later he expanded those six intelligences into nine distinct areas, verbal-linguistic, logical-mathematical, spatial-visual, bodily-kinesthetic, musical, interpersonal, intrapersonal, naturalist, and existential intelligences. Chapman (2014) noted seven of the intelligences are referenced on a regular basis: linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial-visual, interpersonal, and intrapersonal.

Other researchers such as Kagan and Kagan (2014) outlined two additional intelligences known as naturalist and existential intelligence. In alignment with MI and Gardner's work, Kagan and Kagan (2014), who are well-known authors and educational and psychological speakers, have their own beliefs about human learning. Although Kagan's theory is similar to Gardner's theory foundations, Kagan and Kagan (2014) and Gardner (2011) only agree on eight of the nine intelligences.

Kagan and Kagan (2014) align their eight agreed upon theories of multiple intelligences with Gardner and elaborate further on their structure more than intelligences. Visions are a way for teachers to improve their teaching methods and the ways students learn (Kagan & Kagan, 2014). In addition, vision describes what a classroom should look like and bridges the gap between the lessons teachers are teaching and the students' comprehension of the material (Kagan & Kagan, 2014).

The visions identified by Kagan and Kagan (2014) are matching, stretching, and celebrating. Matching consists of determining a student's individual learning style and

then matching the teaching style to the student's individual strengths (Kagan & Kagan, 2014). Stretching gives the teachers opportunity to increase the learning capacity and preferred learning styles of each student (Kagan & Kagan, 2014). Reaching to the student's outer limits to expand their knowledge base is the goal of the stretching vision (Kagan & Kagan, 2014).

Celebrating is a way for students to achieve success and the way in which teachers measure those accomplishments in the classroom (Kagan & Kagan, 2014). Teachers are able to easily measure student success with on-the-spot assessments (Kagan & Kagan, 2014). Celebrating allows teachers to evaluate themselves and see they can change their teaching methodology without changing the material taught (Kagan & Kagan, 2014). As students learn, they reveal their strengths, weaknesses, and personalities (Kagan & Kagan, 2014). Students and teachers consider the discoveries of strengths, weaknesses, and personalities to be small academic achievements resulting in more positive attitudes in the classroom overall (Gardner, 2011; Kagan & Kagan, 2014).

According to Daniels (2004), Kagan's theory promotes both teacher and student engagement by interacting with each other regularly. Ultimately, these interactions may increase the chances of higher student success in the classroom (Kagan & Kagan, 2014). All students learn differently; therefore, teachers need to create environments of freedom and creativity to allow each student to choose the learning style that works best for him or her (Daniels, 2004; Gardner, 2011; Kagan & Kagan, 2014). The emphasis is no longer one of *what* the teacher teaches, but *how* the teacher teaches the lesson (Daniels, 2004). Even though there are nine identified multiple intelligences, the four intelligences used

specifically in this study are: bodily-kinesthetic, mathematical-logical, visual-spatial, and interpersonal (Gardner, 2011).

Bodily-kinesthetic. Bodily-kinesthetic intelligences manifest in the classroom in many ways. According to Gardner (2011), students who are primarily bodily-kinesthetic use action-based learning activities. In general, bodily-kinesthetic involves different aspects of the body such as coordination of the body and eyes, balance, agility, dexterity, and movement (Gardner, 2011). Kagan and Kagan (2014) illustrated this intelligence through the general terminology of a person's motor skills. In the classroom, bodily-kinesthetic may include drama/acting, performing tasks, hands-on, demonstrating, creating, the preparation of an item, and competition (Gardner, 2011; Kagan & Kagan, 2014).

Through all of these actions, students use their intelligence to demonstrate comprehension of the lesson being taught (Gardner, 2011). Kagan and Kagan (2014) purported matching a lesson to a student's preferred style of learning allows the student to select the learning style that works best. A learning environment that supports bodily-kinesthetic intelligence is one which allows students and teachers to work together and independently on different hands-on, in-class activities (Daniels, 2004). Chapman (2014) further explained how bodily-kinesthetic learners thrive on the use of physical movement experiences and the way something feels through touch. Chapman (2014) purported dancers, actors, chefs, and fire fighters are just a few jobs expressed through bodily-kinesthetic intelligence.

Mathematical-logical. Mathematical-logical intelligence manifests in the classroom by measuring the variance between the student' understanding of cause and effect relationships, the analysis of different problems, discovering and comprehending patterns, scientific reasoning, and calculating mathematical problems (Chapman, 2014; Gardner, 2011). More specifically, students use counting exercises, math drills, problem-solving, demonstrating, and calculating (Gardner, 2011). Kagan and Kagan (2014) classified mathematical-logical as a matching vision allowing a student to work in a multitude of ways to accomplish the activity the student is trying to master.

In the same way, teachers are able to present multiple methodologies to achieve the correct answers for problems, and students are able to "match" the method that best fits their preferred learning style (Kagan & Kagan, 2014). In its simplest form, Chapman (2014) described mathematical-logical intelligence as the ability a person has to think through complex or logical problems. Chapman (2014) supported the mathematical-logical learning style by providing examples of jobs that function highly in the mathematical-logical intelligence such as scientists, engineers, accountants, brokers, and statistical researchers.

Visual-spatial. Gardner (2011) explained how the intelligence of visual-spatial allows students more creative freedom. Examples of how students can learn through visual-spatial activities are problem-solving, creating posters, museum projects, making videos or movies, illustrating ideas, and creating collages (Gardner, 2011). Kagan and Kagan (2014) outlined visual-spatial intelligence as students learning through the use of

design, color, and detail. Stretching a student's mind to expand his or her specific

learning talent will inevitably increase his or her visual-spatial intelligence (Kagan &

Kagan, 2014).

Chapman (2014) noted visual-spatial intelligence includes the use of pictures,

three-dimensional images, and shapes and can be incorporated through interpretation,

creation, expression, and understanding the correlation between space and effects as well

as images and its meaning. Visual-spatial intelligence is easier to understand when

viewing the types of jobs this intelligence influences (Chapman 2014). People who work

in roles where visual-spatial talents are most commonly used in their jobs are artists,

designers, architects, photographers, engineers, story-boarders, and stylists (Chapman,

2014).

Interpersonal. Interpersonal learning involves students interacting with each

other and the teacher (Gardner, 2011; Kagan & Kagan, 2014). Kagan and Kagan (2014)

suggested interpersonal intelligence focuses on interactive relationships between the

students and the teachers. Gardner (2011) supplemented this theory by explaining

interactive relationships in the classroom can take on many forms, such as group work,

teamwork, role playing, debating, and performances.

Evseeva and Solozhenko (2015) and Chapman (2014) both described

interpersonal learning as being perceptive and empathetic with other people or knowing

how to relate to another person through emotions and feelings. Teachers, therapists,

human resource professionals, counselors, doctors, professional organizers, and clergy

leaders are examples of people who use interpersonal intelligence in their jobs (Chapman, 2014). According to Chapman (2014), interpersonal learning can manifest itself through communicating with others, cooperative activities, teamwork and human contact, understanding people's life situations, and interpreting human behavior.

Foundations of Flipped Classroom

There is limited research about the flipped classroom at the postsecondary level. According to Noonoo (2012), the higher education flipped classroom was first attempted in 2000 at the University of Miami. At the time, the professors in charge of the flipped classroom referred to the change in the classroom as the *inverted classroom* (Noonoo, 2012; Talbert, 2012). Davis (2012), however, dated the flipped classroom learning environment back to the early 20th century. John Dewey, who was active in the reform of America's education, focused on student-centered learning in his classes, where activities allowed students to do things independently (Davis, 2012). Eric Mazur, a physicist at Harvard, used student-led instruction for nearly two decades in class (Davis, 2012). Although these early references are in higher education, the majority of research examined for this study focused on the secondary level. Huber and Mompoint-Gaillard (2011) quoted Montessori:

> Scientific observation has established that education is not what the teacher gives;
> education is a natural process spontaneously carried out by the human individual,
> and is acquired not by listening to words but by experiences in the environment.
> The task of the teacher becomes that of preparing a series of motives of cultural
> activity, spread over a specifically prepared environment, and then refraining
> from obtrusive interference. (p. 69)

In 2007, Bergmann and Sams, two chemistry instructors, received full credit for developing the flipped classroom experience (Noonoo, 2012). Bergmann and Sams (2012) began using the flipped classroom model in their classrooms at Woodland Park High School in 2006 (Noonoo, 2012). These two instructors formed the entire high school chemistry department and taught lessons to 950 students attending the school (Noonoo, 2012). Together, they decided to take a different approach to teaching by creating lessons plans and teaching together (Noonoo, 2012).

The flipped classroom was created because a large number of the students were accruing absences due to extra-curricular school activities, and the flipped classroom allowed the students to watch the teacher's lectures digitally (Bergmann & Sams, 2012). Noonoo (2012) explained the flip idea originated after Bergmann and Sams read an article in a technology magazine that explained how new software allowed PowerPoint presentations to be recorded along with voice and pen annotations that could be shown as a video. This technology became the delivery methodology for lessons (Noonoo, 2012). In the spring of 2007, Sams and Bergmann launched the technology in their classrooms, creating the flipped classroom-learning environment (Noonoo, 2012).

Flipped learning versus flipped classroom. Estes et al. (2014) explained a true flipped learning environment is an environment which is addressed in four pillars: flexible environment, learning culture, intentional content, and professional educator. Flexible environment consists of the variety of learning styles students are using to learn which coincides with Gardner's theory of multiple intelligences (Estes et al., 2014). Flexibility in the learning environment, where the teachers use different methods and

techniques to deliver lessons to the students, is a significant part of the flipped classroom (LaFee, 2013).

Estes et al. (2014) explained intentional content as providing the students with direct instruction prior to attending class. By providing these specific sessions before class, students were able to obtain a better understanding of concepts discussed, since students had prior knowledge of the subject matter when arriving to class (Estes et al., 2014). Spear (2011) further described intentional content as the way a person thinks about a subject and the manner in which the subject is presented or perceived. Intentional content allows teachers to maximize their time with the students, creating a student-centered learning environment (Estes et al., 2014).

Estes et al. (2014) further noted, the professional educator is able to perfect their craft and work collaboratively with their students, assess their needs, and provide them with immediate feedback. Love, Hodge, Grandgenett, and Swift (2014) further developed Talbert (2012) notes by outlining "just-in-time" teaching, which allows teachers to identify areas of opportunities for students on the spot (p. 320). In addition, Estes et al. (2014) posited the role of the educator includes a vast amount of time for reflection on the lessons and the end results of the lessons.

Hamdan, McKnight, McKnight, and Arfstrom (2013) outlined the activities taking place during teacher reflection. Teacher reflection includes cooperative learning with other teachers; criticisms about their lessons that did not articulate well in the classroom; teaching style; a chaotic, but managed classroom atmosphere; and ways to improve their teaching (Hamdan et al., 2013). Although it may seem as though the professional educator takes on a lessor role in the flipped classroom, the educator maintains credibility

of being most valuable in the facilitation of flipped learning (Estes et al., 2014). Hamdan

et al. (2013) further explained the role of the professional educator as more demanding

than previous teacher roles. Flipped learning requires the professional educator to be in

tune with the pulse of the classroom, knowing when to change instruction from

individualized learning to group learning as opposed to direct instruction (Hamdan et al.,

2013).

Estes et al. (2014) purported the importance of understanding flipped learning is

different than a flipped classroom; however, both components are involved with the

flipped teaching modality. The flipped classroom targets the physical arrangement of the

students' education setting, while flipped learning encompasses the framework and

process of learning students engage in while in the flipped classroom (Estes et al., 2014).

Charged with the task to create a common definition for the flipped classroom, Talbert

(2012) organized a group of educators to complete the task. MacKinnon (2015) reported

educators discussed components of a flipped classroom and arrived at the definition as a:

> . . . pedagogical approach, in which direct instruction moves from the group
>
> learning space to the individual learning space, and the resulting group space is
>
> transformed into a dynamic, interactive learning environment where the educator
>
> guides students as they apply concepts and engage creatively in the subject
>
> matter. (p. 45)

Millard (2012); Tune, Sturek, and Basile (2013); and Love et al. (2014) noted,

while many variations of a true definition of the flipped classroom exist, they do concur

with Estes et al. (2014) that a true flipped classroom has pre-classroom learning activities

and allows interactive, activity-based learning to take place during class time between the

teachers and students. Goodwin and Miller (2013) supported this concept when they explained students spend their time studying and trying to figure out homework during class time and watched the pre-recorded lessons on their own time. Kovach (2014) and Millard (2012) explained the flipped classroom as reversing the internal and external activities of a traditional classroom. Additionally, utilizing technology in this regard allowed students to be in class at any time, from any location where they have internet access (Kovach, 2014).

Tune et al. (2013) described the flipped classroom as students being exposed to lecture material independently through a pre-recorded format such as videos, podcasts, and webinars that are, as noted previously, assigned to watch outside class time. Upon completion of the pre-recorded lessons, students are engaged in a deeper level of thinking and problem-solving in the classroom (Love et al., 2014; Tune et al., 2013). Student-teacher engagement in the classroom gives the teacher the ability to assess the students' knowledge and determine their level of comprehension and understanding of the material already previewed (Tune et al., 2013). Enfield (2013) agreed with Tune et al. (2013) and added, during class time, the students are engaged in collaborative work, which is facilitated and monitored regularly by the teacher.

According to Kim, Kim, Khera, and Getman (2014) and Fulton (2012), flipped learning transforms the traditional learning environment that is teacher-centered into a student-centered learning environment, which inadvertently creates more of an individualized learning opportunity for the students. Stephen Leacock, as cited in Lujan and DiCarlo (2014), purported the difference between teacher and student-centered classrooms when he noted the following analogy:

> If I were founding a university I would found first a smoking room; then when I
>
> had a little more money in hand I would found a dormitory; then after that, or
>
> more probably with it, a decent reading room and a library. After that, if I still had
>
> more money that I couldn't use, I would hire a professor and get some textbooks.
>
> (p. 339)

This quote metaphorically symbolizes how the traditional, teacher-centered classroom works, where the teacher directs all details and usually tells too much (Lujan & DiCarlo, 2014). In the student-centered classroom, the teacher no longer does all the telling, and the students participate in a deeper level of critical thinking, discussions, and searching for solutions on their own, or in groups (Lujan & DiCarlo, 2014).

Gullen and Zimmerman (2013) and Hawks (2014) noted students who attend flipped learning classrooms learn material outside the learning day and apply the knowledge through practical methodology inside the classroom. Raths (2013) elucidated students are often resistant at first to the change taking place inside and outside the classroom, but over time become proud of their ownership of their education. Kovach (2014) and Raths (2013) purported when students own their learning, the education they received is more authentic and powerful, thereby transforming their education into a valuable part of development. Raths (2013) quoted one student's new feelings toward math: "I can actually think about it and understand it more in words not just numbers" (p. 17). Although there are not many data regarding the effectiveness of the flipped classroom or flipped learning, Goodwin and Miller (2013) said, "absence of evidence is not evidence of absence" (p. 79).

According to Bergmann and Sams (2014), flipped classrooms look more like learning/activity centers than a regular classroom. Students are actively engaged in a project, some working independently and others working in groups (Bergmann & Sams, 2014). Allowing the students to actively engage in projects in class provides students with more free-time outside of class, since they complete their assignments during class time (Bergmann & Sams, 2014). Milman (2014) agreed and adds the flipped classroom enables students to be exposed to the material before class. Whether the students read an assignment or watch a teacher-created video on the material, students are preparing for the upcoming class outside of class on their own time (Milman, 2014).

Flipped classrooms are being utilized all over the world, and there is a need for a transformative change in post-secondary education incorporating multiple technologies to invest in the current needs of students (Cargile & Harkness, 2015; Hutchings & Quinney, 2015). Brame (2013) and Tucker (2012) both posed flipped classrooms are not a new model but are gaining popularity and are a repurposed concept that is getting more attention and becoming better known. Bergmann and Sams (2012) noted, with the growth in popularity, a flipped network for classrooms has been created and has become large enough to include websites and a network of professional teachers numbering more than 3,000. Flipped classrooms create an interactive learning environment, which align with Gardner's theories of multiple intelligence in that teachers are able to reach multiple intelligences in one lesson (Hutchings & Quinney, 2015). Hutchings and Quinney (2015) elucidated these interactive learning environments transform inert learning into functional learning.

Benefits of the flipped classroom. When the flipped classroom is correctly implemented, the use of time for the teachers and students is cultivated and increases in efficiency (Kovach, 2014). Continuing this cultivated efficiency outside the classroom, Brunsell and Horejsi (2013) posited, students are enjoying the ability to "take their teachers home" through the mode of the digital lessons (p. 8). Lessons are presented before class time and teachers are able to dedicate class time to interacting with the students, working with them one-to-one, or in groups on various in-class activities (Kovach, 2014). The flipped classroom can also be an effective way to benefit many types of learners, including students who are learning disabled (McCrea, 2014). For instance, by requiring components outside the classroom, teachers have more time to work with students individually, so students with learning disabilities are less likely to get behind in their studies (McCrea, 2014).

According to Goodwin and Miller (2013), one of the benefits of providing lessons that are previewed before class is students are able to watch the digital lessons while being able to start, stop, and repeat the videos as many times as needed to gain full comprehension of the material. Cargile and Harkness (2015) posited the ability for students to review videos in the privacy of their homes as many times as they need to reduce the amount of self-consciousness around peers. In addition to the control of how the students view the lessons, Bergmann and Sams (2013) noted the instruction modules can be watched anytime and from anywhere and are easy to store and retrieve at a later time. Another perk of the flipped classroom is to help busy students work ahead or catch up by watching the lessons at different times based on their schedules (Herreid & Schiller, 2013). In addition, Herreid and Schiller (2013), along with Bergmann and Sams

(2012), reported students with busy schedules in school clubs, organizations, or athletics are able to access lessons in the event of missed school for activities or illness.

Kern (2013) stated the flipped classroom format offers more hands-on application time than was available before in the traditional classroom. Hutchings and Quinney (2015) also reported when students are self-accountable for their learning inside the classroom, teachers see transformative moments in student learning. Additionally, students enjoy having the academic freedom to manage their education with an indirect benefit of increasing self-governance and enthusiasm for learning (Evseeva & Solozhenko, 2015). Flumerfelt and Green (2013) mentioned the flipped classroom promotes an environment where students can peer teach, which encourages a higher level of personal fulfillment for students. Higher rates of comprehension and understanding of the course content find students learning and developing teamwork skills, whereby in-class discussions create more effective student learning environments (Brunsell & Horejsi, 2013).

Brunsell and Horejsi (2013), Hutchings and Quinney (2015), and Millard (2012) reported students stated they enjoyed the higher caliber of discussions taking place during class time. In addition, Herreid and Schiller (2013) reported the time spent in the flipped classroom is also valuable, because students who otherwise would not participate fully during in-class discussions are more likely to engage in class discussions because of being prepared prior to attending class. Brunsell and Horejsi (2013) noted interactions during in-class discussions creates better relationships between teachers and students. Knowing that pre-work done outside of the classroom is assessed consistently, Tune et al. (2013) noted many students took more time to prepare for class.

Furthermore, students reported feeling more prepared for unit exams because of the structure of the class (Tune et al., 2013). In addition, DeFour (2013), Millard (2012), and Sankoff (2014) determined because of better grounding of content by students, the students are able to participate in Socratic lines of questioning to obtain the answers they need. One of the unintended benefits of the flipped classroom is the format helps combat absenteeism (Tucker, 2012). Students seem to enjoy going to class more and can view missed lessons or review lessons they need to view during their own time (Tucker, 2012). Another benefit of the flipped classroom, according to students, is they preferred the format to the traditional method of learning (Tune et al., 2013).

Fulton (2012) purported flipped classrooms can be compared to the metaphor of dangling a carrot in front of the students to encourage learning and push students harder academically. According to Goodwin and Miller (2013), student attitudes also improve after participating in the flipped classroom. Enfield (2013) mentioned other benefits to the flipped classroom including students being able to learn at their own speed, which ultimately helps increase their academic performance and align more directly with their preferred learning style (Goodwin & Miller, 2013). Evseesa and Solozhenko (2015) purported the technology utilized in the flipped classroom is the quintessential component allowing these students to work at their own pace.

Gullen and Zimmerman (2013) and Love et al. (2014) noted students enjoy getting their questions answered while working on their assignments right away rather than waiting until the next day. Herreid and Schiller (2013) posited, in the traditional classroom, students would work on their homework outside of class. If the students had questions, they would not be able to get the answers they needed right away, and get

frustrated, which could lead to higher amounts of incomplete work (Herreid & Schiller, 2013). Teachers using information about students' social and emotional needs addresses interpersonal learning intelligence (Gardner, 2011; Goodwin & Miller, 2013; Kagan & Kagan, 2014). Data about the flipped classroom regarding social needs of students have shown marked changes in the preservation of female and minority student retention (Love et al., 2014). According to Hutchings and Quinney (2015), teachers have commented they enjoy how the flipped classroom lengthens instructional time.

Gullen and Zimmerman (2013), Milman (2014), and Millard (2012) stated professors are able to create packaged lessons for the students much easier than in the traditional classroom format. Faculty who flip their classrooms have felt they experience a greater sense of academic freedom as well as teachers are able to spend more time creating, implementing deeper level thinking, and learning activities into class time (Gullen & Zimmerman, 2013; Millard, 2012; Milman, 2014). Another benefit noted by Goodwin and Miller (2013) is the flipped classroom is current and up-to-date with the technology the students are using. In other words, teachers can speak the digital language of their students (Goodwin & Miller, 2013). Additionally, the new millennial students prefer the flipped classroom because it allows them to practice concepts and learn through making mistakes during those practices in a controlled, technology- enabled, and facilitated environment (Love et al., 2014). Providing students with short, under 10 minute lectures online, aligns directly with research showing a decrease in brain activity after 10 minutes (Goodwin & Miller, 2013).

Engagement statistics of students. According to Author (2012), the flipped classroom has been enriching the lives of students everywhere and is creating more

comprehension and retention of material being taught. Brunsell and Horejsi (2013) reported a rise in positive attitude changes in students who participated in flipped classrooms. Love et al. (2014) and Yarbro, Arfstrom, McKnight and McKnight (2014) conducted a survey of 23 K-12 teachers and 203 K-12 students and found 80% of students felt the student engagement in a flipped classroom created a more positive learning environment and made learning a fun, active process.

Yarbro et al. (2014) further reported 70% of students enjoyed the freedom of choosing learning activities they would work on each day, and the flipped classroom format allowed them to work at their own pace. Although Millard (2012) purported there is not enough proof that flipped classrooms increase student engagement compared to the traditional classroom, she reported positive student responses to their flipped classroom in-class work time. Evseeva and Solozhenko (2015) broached other points about the flipped classroom. In a survey conducted in English courses where student perceptions were garnered about the flipped classroom experience, 85% of students found the flipped classroom increased their engagement and participation, while only 15% of the students did not feel positively toward the design.

Consequently, in one high school there is an increase in student engagement when implementing the flipped classroom (Flumerfelt & Green, 2013). The educators of Clintondale High School in Detroit, Michigan, a school where slightly over 70% of the students are on free and reduced price meals, many students are minorities, and the dropout rate is 61%, decided to flip their curriculum to help their students succeed (Flumerfelt & Green, 2013). Flipping the core curriculum resulted in an improvement in the core subjects across the board on state tests (Ullman, 2013). Clintondale educators

lowered the failure rate in both English and Math by over 30%, with the lowest gains in

Science and Social Studies around 20%. Overall, discipline issues decreased by 66%

(Flumerfelt & Green, 2013). Millard (2012) along with Flumerfelt and Green (2013)

reported the flipped classroom significantly decreased the school's failure rates by 50.4%

in just one quarter after the implementation of the flipped classroom. An increase of

graduation rates was reported at Clintondale from 80 to 90%, which, at that time, was

above the national average (Millard, 2012; Ullman, 2013).

Unlike Clintondale where the focus of the study was core curriculum, a study

conducted by Fulton (2012) at Byron High School focused on higher-level mathematics

coursework to determine the effectiveness of the flipped classroom. Byron High School

implemented the flip when the school could no longer afford math textbooks (Fulton,

2012). Fulton (2012) documented increases of between 5% and 10% after implementing

the flipped classroom in algebra II, pre-calculus, and calculus. In addition, Fulton (2012)

reported Byron High School having about a 60% increase in math comprehensive

assessments scores in just five years after the flipped classroom implementation.

In opposition to the results found at Byron High School where the flipped

classroom had a positive effect on students in math courses, Johnson (2013) reported less

than 10% of students at Okanagan Mission Secondary in British Columbia, Canada,

commented positively about the flipped classroom in their math classes. In addition,

Johnson (2013) noted 3% stated their math performance did not improve, and their

motivation in class was lowered. Tune et al. (2013) compared a traditional classroom

model with a flipped classroom model for the cardiovascular, respiratory, and physiology

courses and noted there was substantial evidence of higher performing students in the flipped classroom.

Enfield (2013) and Yarbro et al. (2014) reported 62.2% of K-12 students rated the flipped classroom digital lessons helpful and purported the curriculum generated meaningful, in-class discussions. However not all students felt the flipped classroom was beneficial (Enfield, 2013; Yarbro et al., 2014). Consequently, K-12 students performing at the top of their classes were of the opinion that digital lessons were less helpful, and the students were less likely to rate digital lessons as interesting or engaging (Enfield, 2013). Enfield (2013) found 94.6% of K-12 students reported the digital lessons were appropriately challenging. When analyzing digital lesson length, Enfield (2013) noted 32.4% of K-12 students felt 20-minute digital lessons were too long, and the remaining students felt the length was just right. Johnson (2013) posited 55% of students were more creative when their learning started from the digital lessons. Additionally, 98% of students reported the regular availability of the digital lessons were significantly beneficial (Evseeva & Solozhenko, 2015).

Engagement statistics of teachers. Hamdan et al. (2013) found using other modalities besides traditional classroom lectures help teachers find methods to personalize their classrooms in new and thought provoking ways. The number of teaching strategies a teacher can create from utilizing a flipped classroom is endless, and studies show significantly higher exam grades for students being taught with other modalities compared to traditionally taught students (Hamdan et al., 2013). While teachers from kindergarten through post-secondary education are using the flipped classroom format, the majority are secondary instructors. Of those, 93% indicated they

did so through their own will and received full support from their administrators (Estes et al., 2014). Goodwin and Miller (2013) reported 99% of the teachers would facilitate a flipped classroom again the following school year.

Since 2012, there has been a 30% increase in teachers reporting they have attempted to flip their classroom at least once (Estes et al., 2014; Goodwin & Miller, 2013). Hamdan et al. (2013) purported 46% of teachers flipping their classrooms have been teaching for more than 16 years. Additionally, Yarbro et al. (2014) reported 68% of teachers who flipped their classroom expressed how helpful the flipped classroom modality was in generating conversation during class time between the students and their peers and teachers. Da Silva (2013) noted 80% of teachers who had flipped their classrooms felt more satisfied in their jobs. Yarbro et al. (2014) reported 100% of the teachers who had flipped their classroom felt the flipped classroom created a more active and overall better learning environment. According to Cargile and Harkness (2015), the flipped classroom created positive results. Seventy-five percent of school districts have faculty fully flipping their classrooms or incorporating at least a few online technology aspects across America (Cargile & Harkness, 2015).

Roles of Teachers and Parents

While teachers are the individuals on the front lines, parents support can be key in making a classroom at any level a success even higher education (Davis, 2012). In the following sections these two key essential members are discussed.

Teachers. LaFee (2013) noted the importance for teachers to have a desire to discover and implement new best practices into the classroom. Having a desire to discover and implement new best practices in the classroom, is an essential component

for the flipped classroom to be successful (LaFee, 2013). Gaughan (2014) conducted interviews with teachers who have flipped their classrooms. One teacher was quoted as saying, "My gift as a teacher is my ability to 'dance' with my students, to teach and learn with them through dialogue and interaction. When my students are willing to dance with me, the result can be a thing of beauty" (Gaughan, 2014, p. 231).

While many teachers are excited about flipping a classroom, there are just as many who are skeptical to flip their classroom and its potentially negative effects on the Socratic teaching methodology (Hamdan et al., 2013). Initial research has shown the flipped classroom actually captures the essence of this critical thinking model (Hutchings & Quinney, 2015). Hamdan et al. (2013) identified the methodology behind Socratic teaching as engaging, assessing, observing, providing immediate feedback, and a guide to learners.

MacKinnon (2015) and Slomanson (2014) stated teachers who use flipped classrooms are using the Socratic methodology and are enjoying their new role as a facilitator who interacts with their students individually during class time. In addition, several researchers have noted one of the reasons the level of interaction in the flipped classroom increases is because the teachers become more of a facilitator, coach, and question-answerer than just a lecturer (Goodwin & Miller, 2013; Bergmann and Sams, 2012). Agreeably, students can only be successful in a flipped classroom if the teacher changes his or her role from that of a teacher lecturer to an application coach (Hutchings & Quinney, 2015). Teachers now spend their time speaking with students rather than at them (Goodwin & Miller, 2013). Enfield (2013) commented, despite common concerns among teachers worrying their role as a teacher would be diminished by the flipped

classroom, the role of the teacher overall would remain the same with the major change being their level of interaction and student engagement.

Under the traditional model, teachers would stand at the front of the classroom lecturing about the classroom material, while in the flipped classroom the teacher moves about the room, monitoring students working actively (Enfield, 2012; Fulton, 2012). According to Goodwin and Miller (2013), removing the teacher from the front of the classroom enables them to identify students' different needs and to relate to students on an emotional and social level as well as addressing their learning needs. Love et al. (2014) concurred on the importance of emotional and social needs in students' learning because it increases pride, motivation, and teamwork in the classroom. Additionally, moving around the classroom helps teachers determine students' individual learning styles; therefore, teachers can teach more effectively and at a higher cognitive level (Bergmann & Sams, 2012).

Bergmann and Sams (2012) noted feedback given in the classroom when it is delivered by a teacher through a short on-the-spot lesson is called, "just in time instruction" (p. 2). These mini lessons are used when an individual or group is having difficulty understanding the concept presented in the flipped classroom media (Bergmann & Sams, 2012). Fulton (2012) stated these impromptu lessons allow the teacher to evaluate when a larger group of students needs help on a particular content item and to present follow-up instruction as a teacher might do in a regular classroom setting.

Lujan and DiCarlo (2014) noted the importance of teachers changing the classroom environment from a teacher-centered learning environment to a project-based, student-centered learning environment. Ullman (2013) purposed teachers have students

outline something in the lesson that is challenging. Then, having the students create their own digital lesson is a great use of time and focuses on students and what they need, which is a shift from a teacher-focused assessment (Ullman, 2013).

LaFee (2013) posited how important it is for the teacher to always have a desire to discover and implement new best practices for the flipped classroom to be successful. Teachers will dedicate more time to creating digital lessons and other interactive lessons as opposed to PowerPoint lecture lessons (Enfield, 2012). Enfield (2013) noted teachers also create new assessments that not only make students accountable to learn the outside class material by watching the digital lessons, but assess their understanding of the material. Teachers become a "guide on the side" as opposed to "sage on a stage" (Talbert, 2012, p. 1).

Additionally, Fulton (2012) pointed out teachers become more involved in core curriculum projects through the flipped classroom model such as bringing meaning to math in a typically non-related math curriculum. In the flipped classroom, teachers are able to create an entire semester or year of curriculum in advance and make it available to their students online (Goodwin & Miller, 2013). Having the curriculum available constantly has shown greater signs of performance and grade improvement among students (Goodwin & Miller, 2013).

When creating a flipped classroom, teachers have to spend quite a few more hours at the beginning during the preparation phase of the lessons, but it pays off in the end (Svan, 2014). During these extra hours of planning, teachers are creating and recording digital lessons, creating objective-based learning activities, and searching for new and innovative formats to support the learning activities (Evseeva & Solozhenko, 2015). Svan

(2014) also reported teachers said they will forever continue the flipped classroom environment. For curriculum involving math, teachers are able to see the process of how students arrive at their answer rather than just the final product (Yarbro et al., 2014). Yarbro et al. (2014) noted teachers appreciate the ability to prevent bad habits from forming, whereas in the traditional model, students work on their own, and it can be difficult for the teacher to redirect.

Svan (2014) reported the flipped classroom allows students to work on different projects at different paces while the teacher is free to facilitate the individualized process. Svan (2014) further noted teachers may be grading a quiz for one student, and then the next student may be discussing homework with the teacher. Students are able to work on mastering the material before moving on to the next material (Cargile & Harkness, 2015). To support this, Cargile and Harkness (2015) reported 84% of students participating in the flipped classroom surpassed the students in a traditional classroom in understanding course content. The flipped classroom was an improvement, resulting in mastery of content, compared to traditional teaching, which continued whether students mastered the content or not (Cargile & Harkness, 2015).

According to Rath (2014), a small group of teachers decided to try the flipped classroom approach and reported they enjoyed the academic freedom it provided in their classrooms. The teachers were also excited with the amount of innovation and technology they were able to master and use with their students in the classroom (Rath, 2014). Most importantly, teachers reported increased engagement and higher caliber of in-class discussions, activities, and writing assignments (Rath, 2014). Even after monitoring the progress of the flipped classroom implementation for an entire school year

and little or no change was found in achievement, teachers felt strongly about the positive components of the flip and continued using the new teaching methodology (Rath, 2014). Yarbro et al. (2014) also found in a similar study their test model of teachers collaborating provided a more successful flipped classroom implementation.

In the flipped teaching modality, teachers are usually able to learn all of their students learning styles and attempt to include the styles in their instructional pedagogy (Enfield, 2013; Gardner, 2011). Classroom engagement by the teacher is not the only benefit, according to Goodwin and Miller (2013). Inadvertently, teachers notice social and emotional needs of the students from being able to interact with students on an individual level (Goodwin & Miller, 2013). When this happens, teachers are able to develop a better understanding of the instructional practices that would more greatly benefit their students, especially students who are at-risk (Goodwin & Miller, 2013).

Parents. Addressing the concerns and roles of the parents is a necessary component to the flipped classroom implementation (Davis, 2012). In some situations, high schools are allowing parents to experience the flipped classroom modality first hand by hosting back-to-school nights (Davis, 2012). During these events, parents are given a syllabus and a short, digital lesson to watch prior to attending the school event (Davis, 2012). Parents then participate in hands-on activities with the teacher to assess their understanding of the concept presented digitally (Davis, 2012). According to Bergmann and Sams (2012). the role of the parent changes only in how they get the answers to many of their questions.

Many parents are excited with the changes in the format of the classroom, which gives parents ability to learn right alongside their child and allows them to become more

involved with their child's education in general (Ng, 2014; Yarbro et al., 2014). Flipped classroom learning has enabled parents to help their children with assignments, whereas in the traditional learning environment, parents are often frustrated and unable to help their children during homework time, especially regarding math or science (Fulton, 2012; Ng, 2014). Parents no longer have to feel inadequate about not understanding their child's homework, since all the homework would be completed during class time (Bergmann & Sams, 2012; Fulton, 2012).

Pearson (2014) reported an extraordinarily positive response among parents. In fact, no parents responded negatively to the flipped classroom (Pearson, 2014). In addition, parents enjoyed their children being able to take full responsibility for their learning and enjoyed seeing their children gain knowledge by watching the lessons (Pearson, 2014). Pearson (2014) noted a testimony by one parent who reported seeing her daughter go from being a frustrated student who did not understand the material to being able to tutor friends in mathematics from other schools who were not using the flipped classroom. Another unintended outcome is the learning gained by the parents who watched the lessons as much as, if not more than, their children (Fulton, 2012). In addition, Fulton (2012) purported parents are helping their children with homework more than ever before.

According to Ash (2012) and Fulton (2012), parents reported favorable reactions to the flipped model overall. Fulton (2012) shared some of the comments by parents, such as how their children are less frustrated with learning the material because the teacher is now available during class time to answer questions. Parents also have access to all the documents the students are using in class in the flipped model (Fulton, 2012).

Parents are also saving money on tutors, since their children get to ask questions during class time, and the parents also stated how they felt the teacher and students' time is better spent during class time (Fulton, 2012). Parents are experiencing a deeper level of involvement with their children who are learning in the flipped classroom (Ash, 2012; Fulton, 2012). Fulton (2012) and Hamdan et al. (2013) reported parents are in favor of their children having small lessons or assessments after viewing the lessons, which helps to verify student comprehension of the information learned in the digital lessons. Ash (2012) also explained at least one parent expressed distrust in the flipped classroom and felt it would really help reinforce the lessons, but should not replace the goal of the classroom.

Overall, feedback from parents presented a positive perspective and overwhelming support for the flipped classroom (Ash, 2012). Parents made comments about the appropriateness of the flipped classroom, since most children are technologically savvy and enjoy spending hours on the computer (Fulton, 2012). Both Ash (2012) and Hamdan et al. (2013) noted parents wanted to see more flipped classrooms happening in their children's schools and were happy with the new teaching methodology. Parents also felt the new digital lessons are much more effective than the old or traditional style (Pearson, 2014).

According to Fulton (2012) and Pearson (2014), parents said teachers who were fun and enthusiastic made better digital video lessons. Parents commented on the ease of accessing the digital video lessons and stated the lessons were a productive use of time, worked well for students who are visual learners, and the students could replay any part of the digital lesson over as many times as they needed until they got the clarification and

comprehension they needed. On the contrary, Fulton (2012) posited parents worry there will be too much time involved with the computer in the household, which will be a problem when more than one child needs to access it each night.

According to Hamdan et al. (2013), parents felt it was more important than ever for the communication with their children's' teachers to be on a more regular basis to stay informed of their children's' progress at a mid-year point as well as end of the year. Reading (2013) indicated specific things parents should be doing to help the success of their child's participation in the flipped classroom. Parents should make a plan to guarantee regular accessibility to the digital lessons, whether that be in the home or a nearby location (Reading, 2013).

Note taking during the digital lessons to develop questions for class time was also a recommendation for parents (Reading, 2013). Reading (2013) confirmed the importance of regular feedback from the parents to the teachers about the functionality of the flipped classroom modality their child was experiencing. Hamdan et al. (2013) expressed the importance of parents remaining involved regularly with their child's participation in the flipped classroom, because, with limited amount of data available, it is crucial to help determine the effectiveness of the flipped modality.

Flipped Classroom Ancillary Areas

In the following sections, challenges and misconceptions of the flipped classroom are outlined, as well as costs and technology involved with implementation of the flipped classroom. Challenges and misconceptions are included with the intent to address concerns of the flipped classroom teaching modality. Many teachers are implementing

the flipped modality into their classrooms, and the costs and technology section outlines the different pieces of technology available and the costs associated with them.

Challenges and misconceptions. Bergman and Sams (2014) and Talbert (2012) purported the importance of underlining the potential negatives as well as the benefits of the flipped classroom. Concerns with overuse of technology and how much time students already spend utilizing computers and handheld mobile devices are important (Bergmann & Sams, 2014; Leung, Kumta, Jin, & Yung, 2014; Talbert, 2012). Students stated taking multiple flipped classes would increase the amount of time engaged digitally both for learning and social reasons (Fulton, 2012).

Bergmann and Sams (2012) posited many people are misinformed, thinking the flipped classroom is a one-size-fits all format, while class time is used to sit in front of a computer and learn entirely online. Additionally, Bergmann, Overmyer, and Wilie (2013) noted most misconceptions about flipped classroom modality center around the emphasis placed on watching digital lessons with no other instruction from the teacher, as in an online course. Bergmann et al. (2012) explained that digital lessons are only one part of the flipped classroom construction. More importantly is the quality interaction and one-on-one time the students get with the teacher in class, since they have been exposed to the lessons prior to attending (Bergmann et al., 2012).

After students viewed flipped classroom material prior to attending class, some did not like the way teachers would immediately give them quizzes at the beginning of the period without offering time to seek answers to the questions they developed before the session (Tune et al., 2013). In the flipped classroom, Tune et al. (2013) noted students felt as though their workload had increased slightly. Specifically, their study

time had doubled due to the amount of digital lessons they had to watch prior to attending class (Tune et al., 2013). Enfield (2013) expressed concerns with the potential for less homework and more time involvement, with less formulated pedagogical lessons for students. Pedagogy and methodology are two areas commonly misunderstood in the flipped classroom (Bergmann & Sams, 2012).

Pedagogy and methodology describe specific methods of instruction and learning (Enfield, 2013). Enfield (2013) purposed, while there are positive benefits of creating a student-centered environment, there is a challenge for teachers being unable to determine the individual learning style of each student. In addition to in-class activities and learning styles, Yarbro et al. (2014) expressed concerns about outside-of-class activities and students not having the same accessibility to the necessary technology required for full participation in the flipped classroom.

Another challenge moving the classroom into a digital teaching modality would be addressing equality and access to technology. Springen (2013) posited underprivileged students might experience limited access and may have to rely on public or shared computers. Springen (2013) elucidated having the latest personal mobile devices or home computers for students in poverty were not a priority when basic needs, such as food and shelter, were required.

McCrea (2014) noted critics of flipped classrooms stated the modality sounds like an innovative idea, but with the growing number of low-income households, students would not be able to view the digital lessons outside of the classroom. Ullman (2013) purported many students do not have outside internet access but reported some schools were working with local tele-communication businesses to consider offering free or

reduced internet access for families meeting certain financial criteria. McCrea (2014)

offered further solutions when she explained some schools are increasing students'

computer lab time to accommodate their needs and providing after school times for

flipped classroom digital lesson viewing. The teachers are also decreasing the

accessibility gap by making digital lessons compatible with smartphone devices, so

students who have long bus rides can make the most of their time on the ride and watch

the lessons (Bergmann & Sams, 2012). Both LaFee (2013) and Ullman (2013) noted the

technology needed for the flipped classroom may be challenging for some schools that

lack the means, but is still possible if the teachers and students are motivated enough.

Students who attend schools with a stronger funding base, as well as having

parents with the capability to provide opportunities, have even more access to the latest

technology (Bergmann & Sams, 2013; Talbert, 2012). Students often have their own PC

with high-speed internet access and the latest personal mobile devices allowing them

more freedom to access the material from anywhere and anytime (Bergmann & Sams,

2013; Talbert, 2012). Some schools have encouraged students who have the means to

obtain their own personal devices to bring these devices to use during classes (Berge &

Muilenburg, 2012).

Enfield (2013) noted a concern among teachers was digital lessons taking their

place, diminishing their role, and no longer being an integral component to a student's

education. Bergmann et al. (2012) and Leung et al. (2014) made sure to address this

misnomer by saying teachers in the flipped classroom do more work creating the digital

lessons and all of the learning activities for the classroom. Enfield (2013) agreed but

drew attention to the potential for low quality digital lessons possibly creating student-

viewing issues. Furthermore, Enfield (2013) posited teachers were apprehensive outside classwork would not be as interactive as an in-class environment. However, digital lessons could lead to a higher level of student accountability to learn the material, knowing there would be interaction with the teachers upon arrival to class (Enfield, 2013). Enfield (2013) posited teachers are struggling to some extent on how to engage the students during class-time when students already have content knowledge, thus taking the content to a deeper-level of understanding. Some teachers may misunderstand group work and in-class time activities, which are not deepening student comprehension and understanding (Enfield, 2013)

Hamdan et al. (2013) reported teachers were concerned with the amount of important information that could be lost without students participating in a traditional teaching modality. Hamdan et al. (2013) explained now teachers intermingle with students, converse about the lesson topics, and act as an active participant in the activities in the classroom. Therefore, teacher/student engagement happens through assessing, observing, and regular feedback so information does not get lost (Hamdan et al., 2013).

Bergmann et al. (2012) stated concerns of little to no structure in the flipped classroom. The truth is there is more structure, because the teacher facilitated learning and the students took ownership in the lessons and led discussions (Bergmann et al., 2012). Furthermore, there is a higher level of thinking and more collaborative work in the classroom, which is accomplished through observations, immediate feedback and assessments, and students asking real-time questions during their active learning time (Bergmann et al., 2012; Fulton, 2012). Teachers will have to think on their feet more than ever when interacting with the students (Sankoff, 2014). Millard (2012) also explained

how difficult it can be to track the progress of individual students in a large room and how the flipped classroom changed this.

Costs and technology. Flipping a classroom can involve technologies such as podcasts, webinars, the internet, desktop computers, laptops, iPads, tablets, smartphones, and other mobile or handheld devices, which eliminates the traditional teacher-centered methodology (Gullen & Zimmerman, 2013; Leung et al., 2014). Barker (2013) purported many schools are looking at the flipped classroom as a way to provide cost effective instruction because a larger audience can be taught at one time. While the flipped classroom can be efficient for schools, costs are sometimes passed on to students since they will be required to have a personal computer and internet access in their homes to watch the digital lessons (Ullman, 2013). Ullman (2013) opposed this speculation and noted computers and internet are not required in students' home since many districts open their computer lab to students to watch the digital lessons. At Joseph Sears School in Kenilworth, IL, teachers commented many of their students do not have internet access, so the teachers burn the digital lessons onto DVDs to get around the lack of internet technology, only costing the school about 20 cents per DVD (Ullman, 2013).

Other challenges, aside from personal computers and internet access, could be usability, accessibility, and digital lesson delivery. Herreid and Schiller (2013) posited when instructors use channels for their digital lessons, such as YouTube, students must also endure commercials having nothing to do with their lesson, and students may not absorb the material by watching a digital lesson alone. Enfield (2013) noted some students experience technical issues throughout the lessons, which negatively affects their learning, causing the students to report annoyance with technology. Although many

students have no previous formal training with technology used in the flipped classroom, Enfield (2013) claimed an unintended result in which students actually increased their levels of confidence to learn new technology. Brame (2013) reported an increase over an eight-year period in student grades due to the technology use of the flipped classroom.

　　　　While focusing on the use of technology in the classroom, it is necessary to point out technology that already exists in most classrooms. Social media has become a huge part of the flipped classroom environment as well, allowing students to communicate quickly and efficiently through online chats, discussion forums, blog posts, and different types of online project based learning (Sherbino & Frank, 2015). Furthermore, using social media in the flipped classroom combats the idea that social media sites, such as Facebook, is only for social interaction and not school-oriented learning (Sherbino & Frank, 2015). Although there is not a specific cost related to the flipped classroom technology in relation to social media, it is estimated the flipped classroom can save thousands of dollars using these mediums (Sherbino & Frank, 2015).

　　　　Enabling teachers and schools to save money on office supplies is only the beginning of unanticipated cost-saving ideas derived from the use of a flipped classroom. There are many free technology tools, which support teachers around the world to becoming even better at flipping their classrooms (Ed Tech, 2014; Herreid & Schiller, 2013). ShowMe, Educreations, Sophia, Knowmia, and Ted-Ed are some of the top technologies available on the market that marry well with flipped classrooms (Ed Tech, 2014; Herreid & Schiller, 2013). In addition, Hawks (2014) and Kovach (2014) purported there are good companion products on the market to use with the flipped classroom such as podcasts, YouTube, and many student-centered learning websites. Da Silva (2013)

explained a piece of technology available that does not require any extra hardware or

costs is called Panopto, which is an application used in conjunction with Panopto's Web

Video and Media Editor and allows students to use their own devices to create, record,

and send assignments electronically. ScreenChomp is a free, downloadable application

that can transform the user's iPad into a screen-capturing device (EdTech, 2014). In

addition, Screenr, which is a product allowing users to create webcasts, can be created

without a software download and is a free option, but the company does have

upgradeable options for a cost, which allows more access (EdTech, 2014).

In his research, Da Silva (2013) presented a free software called TabSuite, which

is also gaining popularity in flipped classrooms. TabSuite allows teachers to create web-

based lessons that incorporate live videos, drawings, and animations into the lessons and

has been designed with mobile devices such as the iPad in mind (DaSilva, 2013). Da

Silva (2013) also noted TabSuite has a camera component, called TabCam, which allows

teachers to send and manipulate videos live from their iPads. Other resources available

online are programs such as Present.Me, which is free but offers account users the option

to pay and upgrade, eliminating the need of screen-capture software and allowing the

users to put their video on a split screen with a PowerPoint presentation simultaneously

for student viewing (EdTech, 2014). Slideshare is another good, free technology for

students who do not have time to watch digital lessons online and is useful for online

meetings at specifically appointed times (EdTech, 2014). For editing software, Skitch

offers a product at no cost allowing users to annotate images and other pictures used in

presentations (Svan, 2014). A cloud editor called WeVideo lets users work together on

video editing online and is free (EdTech, 2014).

Although eLearning Management Systems (LMS) are not free, schools usually already employ these systems, so utilizing them to flip a classroom is another tool available to teachers for no additional cost (Kakosimos, 2015). Kim et al. (2014) outlined a commonly used LMS, Blackboard, which is ideal for group discussions and posting digital lessons and is easily accessible outside the classroom. Kakosimos (2015) added LMS offer mobile versions allowing students to view the digital lessons and the other course content on smart devices if a desktop computer is unavailable.

Unfortunately, all technology used in the flipped classroom cannot be free. Some of the technology used in the flipped classroom can be purchased for a one-time price, while others may be rented or leased. Evseeva and Solozhenko (2015) noted a low-cost technology called Moodle, an LMS which provides studying tools, technical support, modes of collaboration for teachers and students, and many more benefits. Bergmann and Sams (2012) suggested a few pieces of software for one-time purchase that would be beneficial in a flipped classroom beginning with pen annotation, which allows teachers to write on their computer screens during the digital lesson as if it were a dry erase board in the classroom. Additionally, Sams and Bergman (2012) posited teachers found pen annotation to be a highly desired piece of flipped classroom technology, ranging from under $60 up to $4000 for whiteboards. Other tools suggested were interactive whiteboards, a microphone, a webcam, recording software, wireless tablets, and document and video cameras (Bergmann & Sams, 2012).

Another type of software technology such as Screenflow can be used in the classroom, which costs about $99 and allows users to record all of the activities on their monitor as well as create video and voice recordings (Ed Tech, 2014). Brame (2013) and

Millard (2012) noted K-12 and post-secondary students use more "in the moment"

technology such as clickers, which are real-time response receivers. Brame (2013) and

Millard (2012) noted how the devices work during interactive discussions. The students

use the clickers to select their answer, which is immediately reported to the teacher.

Brame (2013) and Millard (2012) elucidated how these clickers, which may be purchased

for under $55, provide the teachers with private, instant feedback, resulting in a quicker

way to assess individual student learning.

In addition to one-time purchase costs, there are technologies that can be rented

anywhere from one semester up to four years. Software such as Camtasia, IshowU, and a

web-based resource such as Vimeo records, videos, edits, has video-sharing capabilities

and screen-captures and can cost as little as $9.95 a semester, or as much as $59.95 a year

(Ed Tech, 2014; Svan, 2014). Gaughan (2014) recounted one teacher stating how easy it

was to create and edit digital video lessons using Camtasia and how easily and quickly

those digital lessons could be converted to YouTube video files. Brame (2013) and

Millard (2012) recommended the iClickers App for Smartphones to be used in

conjunction with the student clicker.

There are also resources available and needed in order to comply with the

Americans with Disabilities Act. Enfield (2013) noted each digital lesson would need to

include closed captioning and students with certain learning disabilities would need

transcripts of the lessons provided. Watson (2005) purported an example of technology

that would be beneficial to meet the requirements is a Screen Reader, which is computer

software designed to help visually-impaired students. Enfield (2013) explained Screen

Reader works through Braille and speech using the software Text-To-Speech Engine,

which takes all of the typed information and turns it into an auditory form. Braille can also be part of this technology's benefit, with the addition of an external piece of hardware referred to as a Refreshable Braille Display (Enfield, 2013). Watson (20005) reported these different pieces of technology are free since they are already built into most electronic devices and computers.

Summary

The review of all the previous research completed on the topic of this proposed study are presented in Chapter Two. The chapter began with the theoretical framework by introducing the two main theorists involved with multiple learning intelligences: Gardner and Kagan. The learning intelligences outlined in this chapter, which were the primary intelligences used in this study, were bodily-kinesthetic, mathematical-logical, visual-spatial, and interpersonal. Following the description of these intelligences originally identified by Gardner and Kagan were the remaining components of the literature review, beginning with a background of the foundations of the flipped classroom and explanations of the differences and similarities between flipped learning and the flipped classroom.

Other areas outlined in this chapter included benefits and engagement statistics of students and teachers, which explained how the roles of teachers and parents change, if at all, in the flipped classroom. The final component of this chapter was the ancillary areas of flipped classrooms including challenges, misconceptions, costs, and technology. All of the topics identified support the research being conducted in the proposed study. In Chapter Three, the research design, instrumentation, data collection methodology, and data analysis techniques to be employed are discussed.

Chapter Three: Methodology

The purpose of this study was to compare instructor perceptions and the opinions of students in the culinary arts program where a flipped classroom learning environment was used for an entire semester. The components of the flipped classroom modality involved the use of internet learning, hands-on application, objective-based lessons outside of class, and interactions with the instructor during class time. Through action research, the research components of this study outlined the differences between quantitative and qualitative research. In this chapter, action research is described and explained why it is an appropriate methodology for this study.

Problem and Purpose Overview

While general information about the flipped classroom exists, there are limited data regarding the impact of this modality on success or failure rates in technical education programs. Action research allows the researcher to act in a dual role and be a participant as well (Herr & Anderson, 2015). As the researcher and participant, the purpose is to reflect on efforts to improve teaching practices with end goals of increasing academic success among students (Hendricks, 2013). The reason action research is appropriate for this study is because the question exists whether students will perform at a higher level when material is presented in a student-centered learning environment, helping to achieve the goal of overall student success (Sagor, 2011).

Research Questions

The following research questions were created to guide the data collection for this study. Questions one and two were qualitative in nature, and questions three through five were quantitative. Questions three and four were addressed using descriptive analysis,

and question five used inferential statistics. All five research questions were designed to collect data throughout the sixteen-week study.

1. How does the level of engagement, as measured by the engagement rubric, differ for students in a traditional culinary arts technical classroom, as compared to students in a flipped culinary arts technical classroom?

2. How does the role of the teacher change, if at all, in a flipped culinary arts technical classroom in comparison to the role of the teacher in a traditional culinary arts technical classroom?

3. What perceptions do students in a culinary arts technical flipped classroom possess in regards to their learning?

4. What aspects do students in a culinary arts technical program report as support or as potential barriers for their learning in the culinary arts technical flipped classroom?

5. What differences exist if any, in student academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical classroom, as measured by end of course grades?

H5o: There is no statistically significant difference in academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical classroom as measured by end of course grades.

H5a: There is a statistically significant difference in academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical education classroom as measured by end of course grades.

Research Design

This study used an action-based research design, which included components of both qualitative and quantitative research (Hendricks, 2013; Herr & Anderson, 2015). The choice of action-based research was appropriate as the intent was to evaluate and re-evaluate current teaching methodologies and to make changes in instruction for improvement of student learning (Sagor, 2011). Action research is a process completed by the person participating in the action itself (Sagor, 2011). Primarily, action research is used when the participant wishes to improve or modify his or her actions in a particular setting, making the research a process for self-reflection (Herr & Anderson, 2015). Due to action research being an opportunity for researchers to reflect on their own processes, it is necessary to write the dissertation in first person (Hendricks, 2013; Herr & Anderson, 2015).

Herr and Anderson (2015) purposed action-based research may require the researcher to be both an internal and external component to the study. Until now, as the researcher, I have experienced an external role (Herr & Anderson, 2015). When data collection began, my role increased by participating in the research with roles both outside and inside the study. An insider or an internal researcher is one who interacts in the process (Herr & Anderson, 2015).

Hendricks (2013) elucidated internal research can be controlled more by the participant, and external research is often beyond the control of the participant. Often internal research questions in action-based research are those the participant asks to gain valuable knowledge on how he or she could do things better in the classroom (Herr & Anderson, 2015). As the researcher and participant in the study, any question able to be

directly affected by the researcher-participant becomes internal research (Herr & Anderson, 2015). According to Hendricks (2013), both quantitative and qualitative research can be considered as either internal or external research depending on the context in which the research question is asked. It was important to utilize both types of research to add validity and credibility to the study (Hendricks, 2013; Herr & Anderson, 2015).

Research questions one and two, which are representative of internal research, were addressed using qualitative data collection because of the exploratory and interpretive nature inherit to that methodology (Creswell, 2015; Herr & Anderson, 2015). Qualitative research is often used when answers are needed for complex problems which usually result in describing and providing understanding to the problem from the viewpoint of the participant (Creswell, 2015; Hendricks, 2013). Thought of as interpretative and constructive in nature, qualitative research provides the researcher with a better understanding of situations, which may be answered through observations (Hendricks, 2013). Specific variables present themselves through the data, which then lead to subject-specific information, patterns, or theories to explain the problems in the study (Creswell, 2015).

The majority of the data collection process is personal in many ways, since the researcher records data from interviews and observations (Hendricks, 2013). Creswell (2015) identified qualitative research as more subjective and personal than quantitative research, as data are gathered by speaking to individuals in a study rather than sending out instruments to be completed and returned. Instrumentation often used in qualitative research could include observations by the researcher at the field site rather than having

the participants come to the researcher (Creswell, 2015). One-to-one interviews are often

generalizable and flexible enough to allow multiple responses from the participants

(Creswell, 2015). Audiovisual recording devices help maintain credibility to the dialogue

(Creswell, 2015). As the researcher, when using qualitative design, it becomes necessary

to expose personal biases, agendas, background, and other demographic information

initially to avoid any potential ethical issues later (Creswell, 2015). Furthermore,

Creswell (2015) explained how researchers can validate their research by using various

strategies such as triangulating different findings to create a comprehensible

rationalization of themes.

Research questions three, four, and five were representative of an external data

component and were addressed using quantitative research (Creswell, 2015; Herr &

Anderson, 2015). The purpose of quantitative research is to answer questions describing

the interaction between variables that explain, predict, and control different occurrences

(Creswell, 2015). The process uses well-structured concepts, and in some questions,

variables and hypothesis (Creswell, 2015).

The research in this study compared two classes of students learning the same

curriculum but delivered through two different teaching modalities. Additionally,

quantitative research is most often used when the researcher is examining individual and

course grades (Hendricks, 2013). Since the grades are one specific variable, quantitative

research is appropriate (Creswell, 2015).

Quantitative data collection involves the researcher trying to identify certain

generalized, numerical variables and to collect data related to them. Creswell (2015)

purposed research questions requiring a hypothesis tend to explore the data through

deductive reasoning and then make conclusions from it. Although quantitative research

involves numbers and statistics, it is usually necessary to validate the research with one

of three basic methods: construct validity, content validity, and predictive validity

(Creswell, 2015). Content validity requires the researcher to address all components of

the tasks being measured (Creswell, 2015). Predictive validity compares the predicted

variables with the outcome variables and construct validity determines whether the

evaluation measured what it was intended to measure (Creswell, 2015).

Population and Sample

The sample for this study was derived from the students in the Culinary Arts,

Hospitality Management, Technical Education program, totaling 347 students. The

sample was garnered from secondary high school students in the post-secondary Culinary

Arts program. All secondary high school students were asked to participate, but only

students, parents, and sending school administrators who offered their consent for

participation were included in the data collection. The sample for this study included 24

students in a Culinary Arts, Technical Education program.

Instrumentation

Several different methods of data collection were used. The following sections

describe each type of instrument in detail. Some of the instruments explained were used

throughout the entire study on a weekly basis. Other instruments were only utilized to

gather data every four weeks of the study. The final instrument was used only once, at the

end of the study, to gather and report end of course grades.

Technology accessibility and prior knowledge survey. An efficient method to

gather inquiry data is in the form of surveys, due to the fact many participants can be

surveyed at the same time (Hendricks, 2013). Hendricks (2013) purported collecting data

through surveys can also be a great way to save time. A pre-study survey was conducted

with students to determine the accessibility of the technology required for participation in

the flipped classroom (see Appendix A). Additionally, the survey included questions

regarding the student's current or prior knowledge, if any, of the flipped classroom-

learning environment. The outcome of this survey could provide information by

establishing a baseline (Hendricks, 2013). In addition, it was necessary to determine

which technology each student would be utilizing during the study. For the other

components of the study, multiple data collection instruments were used, both qualitative

and quantitative in nature.

  Engagement journal. Journaling, either student-generated or teacher-generated,

are both effective ways to gather data to "evaluate both affective and behavioral

information" (Hendricks, 2013, p. 96). Journaling was a qualitative component used for

research questions one and two. Student engagement was addressed in research question

one and was recorded through observations (see Appendix B). In the roles of both

researcher and instructor, I created an engagement journaling form that was accompanied

by a scoring matrix to more accurately record levels of engagement among the students.

  The electronic form for the engagement journal was created in Google Docs and

began with a dropdown menu to select the level of engagement for the overall class. The

remainder of the electronic form was divided into three sections allowing journaling to be

recorded, dated, and time stamped. The sections on the electronic form all focused on the

activities of the classroom and what I, the instructor, had been doing that day, what the

students were working on, and general thoughts for feedback about the class period. At a

certain time each day during class, I gave the students one of their 10-minute breaks, and I answered the journal questions.

The next portion of the engagement journal helped record my observations of the students, their levels of engagement, and create validity and reliability for my observations. To provide more credibility to this particular instrument, a scoring matrix was added, allowing me to assign actual values to each student's level of engagement (see Appendix C). The matrix ranged with scores from one to four, where one was *needs direction* and four indicated *exceeding the expectations*. I administered the scoring matrix at the beginning of the semester then at the end of weeks four, eight, 12, and 16.

Prior to either implementing the journal or scoring matrix into the study, I piloted the matrix with other instructors to further test validity and reliability (Creswell, 2015). I asked instructors to utilize the matrix in their classes and provide written feedback on the components that were successful or did not work. In addition to this scoring matrix, I created a spreadsheet to record the data from the matrix, which provided data outlining the averages for each scoring category as well as the total average of observed engagement for each student (see Appendix D). Not only did these instruments help me compare student engagement between the two modalities, but also allowed me to monitor the students' progress throughout the semester.

Reflective journal. In research question two, the role of the instructor was viewed by comparing instructor expectations in both the flipped and traditional classroom. The reflective journal was used for recording the day's activities, focusing primarily on lesson plans (see Appendix E). By using this data collection instrument, it allowed me to record what worked, what did not work, and what changes could be made,

if any, to alter the lesson plans and activities in the flipped classroom. Hendricks (2013) suggested recording data as soon as it happens to ensure accurate documentation as well as providing context so the readers better understand each entry.

Course grade data. Research question five was quantitative in nature and required compared the differences, if any, between student academic performance in the traditional and flipped classrooms. End of semester grades for both classes were used and analyzed. Although the analysis of grades cannot be generalized beyond this study, the researcher gathered external data to provide a direction to see if a difference exists between the two modalities, only for classroom purposes.

Data Collection

After obtaining IRB approval from Lindenwood University (see Appendix F) and the participating institution (see Appendix G), the data collection and study began by gathering the necessary documentation from the participants. First, I gained institutional permission from the high schools the students attended (see Appendix H). Next, I personally met with the parents to obtain permission (see Appendix I) and with students to obtain the final layer of information to gain the necessary authorization to participate in the study (see Appendix J).

After obtaining permission to participate, I administered the Technology Accessibility and Prior Knowledge Survey to create a baseline. At the end of the semester, the Post-Course Student Perceptions Survey was administered to garner data regarding students' perceptions of the flipped classroom (see Appendix K). As the Culinary Arts courses commenced, the data tools described in instrumentation were

utilized throughout the semester to gather data. At the conclusion of the semester, course grade data were extracted for data analysis.

Data Analysis

Hendricks (2013) and Herr and Anderson (2015) recommended interim analysis, which allows the researcher to informally analyze data throughout the study, achieving unintended benefits such as strengthening data collection efforts during the study and taking the researcher to a more profound level of understanding. Each piece of datum was reviewed on a different schedule. Survey data provided by the students were analyzed at the beginning and end of the semester. The engagement journal and matrix were administered and analyzed every four weeks, seeking information regarding levels of student engagement. The reflective journal was completed and cumulative information was reviewed with the purpose of looking for themes and patterns (Creswell, 2015). The final data set, the course grade data, were analyzed using a two tailed *t*-test, from both instructional modalities (Bluman, 2009).

Summary

The contents of this chapter outlined the research design methodology, instrumentation for data collection, and the analysis of the collected data. Additionally, the qualitative and quantitative components allowed the researcher- participant to continually monitor the relevance of the data being collected to validate the study. Action research provided the researcher an opportunity to participate internally as the participating instructor and externally as the researcher. Given the purpose of wanting to reflect on my own teaching practices and levels of student engagement in my classes,

action research was appropriate for this study (Henricks, 2013; Herr & Anderson, 2015; Sagor, 2011).

The qualitative component was important to ensure the quality of the data and allowed the researcher to have a certain amount of literary expression. The quantitative data were important to ensure there were enough collected data to validate the study. Action research is reflective in nature, so the study is often written in first person, which allows the researcher the opportunity to reflect, act, and evaluate his or her own instruction and validate the effectiveness (Hendricks, 2013; Herr & Anderson, 2015). Whether or not there are significant differences in student academic success in a Culinary Arts Technical Education flipped or traditional classroom, were a main focus of this study.

In addition to the explanation of research design used for this study, the instruments used to collect data were outlined in this chapter. The instruments used were a pre-study instructional technology accessibility and prior knowledge survey, an engagement journal that took place during break time of each class, a reflective journal used by the instructor at the end of class, and a post-study survey. A brief description of how the data were analyzed in Chapter Four was also included in this chapter. In Chapter Four, the results of the data collection are presented.

Chapter Four: Analysis of Data

While a copious amount of data regarding the flipped classroom for general education studies was available, few studies were found that focused on technical programs, specifically culinary arts. This study was designed to focus on the effectiveness and student engagement of both flipped and traditional teaching methodologies. Various instruments were created for this study to collect data from multiple perspectives. In staying with an action research approach, the researcher not only was the liaison to the research process, but also the instructor in the classroom where the study took place (Hendricks, 2013; Herr & Anderson, 2015).

The instruments created were a pre-course technology survey, reflective journal, student engagement rubric, engagement scoring matrix, engagement journal, and post-course student perceptions survey. Each instrument was designed specifically for the purpose of this study and may not be able to be generalized for other studies. Research questions one through four used qualitative instrumentation. Quantitative instrumentation was used for research question five. The findings from each instrument are discussed in detail in the next section.

Data Analysis

Research question one. *How does the level of engagement, as measured by the engagement rubric, differ for students in a traditional culinary arts technical classroom, as compared to students in a flipped culinary arts technical classroom?* Data for this research question were gathered in weeks four, eight, 12, and 16. The engagement matrix and the engagement journal instrumentation tools were used by the researcher to gather data to answer research question one.

Engagement matrix. The engagement matrix was created to allow the researcher to consistently and fairly measure student engagement in two different teaching styles; the flipped classroom and traditional classroom. The matrix measured multiple areas of student engagement, assigning numerical values to each predictor. The numerical values were a score of one, *needs direction*, two, *below expectations*, three, *meets expectations*, and four, *exceeds expectations*. There were five areas of engagement measured in the matrix.

At quarterly increments during the semester, the instructor used the engagement matrix to record levels of engagement for all students. Each student was scored individually, given a score ranging from 1-4 where one represented *did not meet expectations and needs direction*, to four, indicating *exceeded expectations*. The scores of all students were then averaged together to obtain a mean score for each category on the engagement matrix.

The first scoring period, week four, resulted in an average engagement score of 2.6 for the flipped classroom and a slightly lower score of 2.31 for the traditional classroom. As a whole, neither the flipped, nor the traditional class scored a three or four based on the researcher's observations of engagement. A score of three would have indicated my perception of student engagement was meeting expectation. A score of four would have indicated students were exceeding expectations. Minimal differences existed in teacher ratings between the two methodologies. The scores obtained from the instructor evaluation from week four are shown in Table 1.

Table 1

Week Four Engagement Data

	In-Class Participation	Student & Instructor	Peer Engagement	Student Attentiveness	Student Preparedness	*M*
Flip.[a]	2.85	2.62	2.15	2.69	2.69	2.60
Trad.[b]	2.44	2.56	2.33	2.22	2.00	2.31

Note. M = Mean Score Total Student Engagement Week Four. [a] Flipped Classroom. [b] Traditional Classroom. A score of 3 is considered meeting expectations.

Overall, teacher ratings of the students in the flipped classroom were higher in in-class participation, student & instructor, student attentiveness and student preparedness. Alternatively, the traditional classroom ranked higher in peer engagement than the flipped classroom. At this time, the difference in overall engagement between the two classrooms appeared to be very small; therefore, a proper determination whether the flipped classroom was more engaged or not could not be made during the beginning weeks of implementation. The results are further reported using a line graph to allow a clear view of the differences and similarities between the classes. The results for week four are illustrated in Figure 1.

Figure 1. Student engagement results week four. The solid line refers to the flipped class teaching methodology, while the dotted line refers to the traditional class. The points represent each predicator being measured for student engagement in week four.

The researcher observed the students again in week eight, using the engagement matrix to score the level of engagement. In the four weeks since the first observation of engagement, the overall engagement score increased in the flipped classroom, by .20, whereas the overall score in the traditional classroom declined by .13. The scores of each predictor, as observed by the researcher, are illustrated in Table 2.

Table 2

Week Eight Engagement Data

	In-Class Participation	Student & Instructor	Peer Engagement	Student Attentiveness	Student Preparedness	*M*
Flip.[a]	2.62	2.77	2.31	3.38	2.92	2.80
Trad.[b]	2.22	2.89	2.33	2.00	1.44	2.18

Note. M = Mean Score Total Student Engagement Week Eight. [a] Flipped Classroom. [b] Traditional Classroom. A score of 3 is considered meeting expectations.

Although students in the flipped classroom continued the trend of being more engaged overall, both the flipped classroom and the traditional classroom experienced a decline in the predictor of in-class participation from the previous observation in week four. Both class formats increased in scores for student engagement with the instructor in the second quarter, but this time, the flipped classroom scored lower than the traditional classroom. Peer engagement remained consistent for the traditional classroom, as well as scoring higher than the flipped classroom; however, the flipped classroom did show an increase in peer engagement.

In the remaining two predictors for week eight, student attentiveness and student preparedness, the flipped classroom experienced an increase, while the traditional classroom experienced a decrease. The first three predictors (in-class participation, student engagement with instructor, and peer engagement) remained relatively consistent with week four, during the week eight observation period. Comparatively, the last two predictors, student attentiveness and student preparedness, began to show a wider margin

of difference in measured engagement. The information for week eight in a line graph

depicting the plotted results for the scores is illustrated in Figure 2.
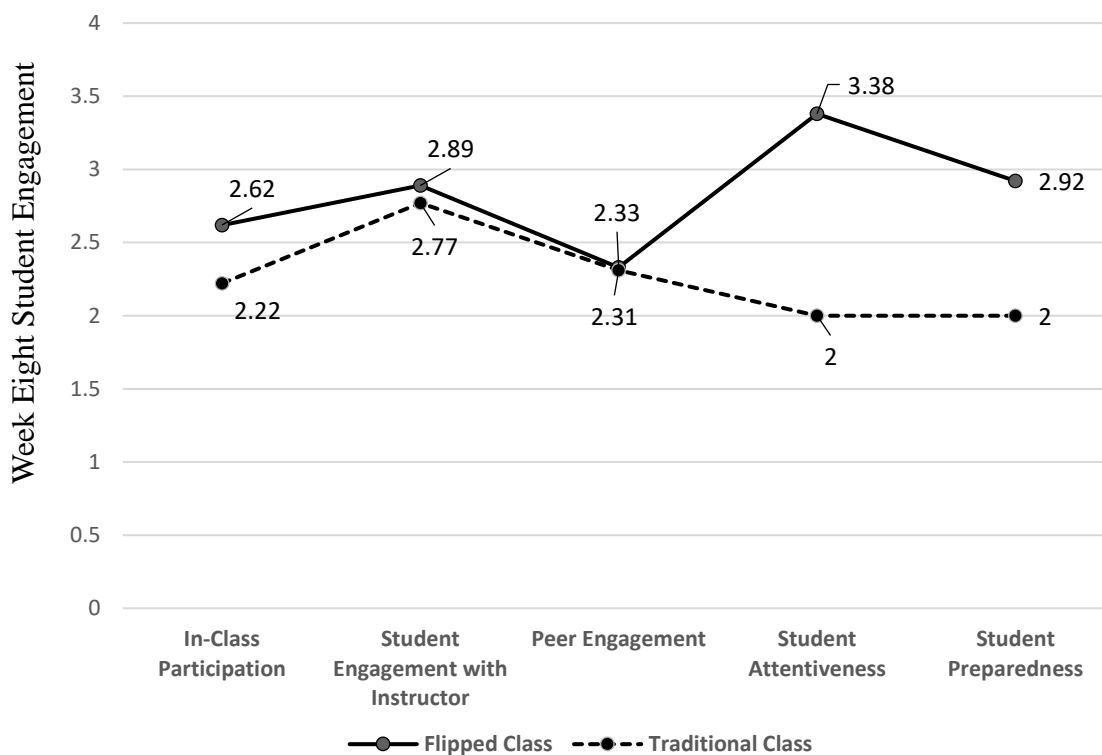
Figure 2. Student engagement results week eight. The solid line refers to the Flipped Class

teaching methodology, while the dotted line refers to the Traditional Class. The points represent

each predicator being measured for student engagement in week eight.

Although week eight data reflected consistency in the flipped classroom having

higher levels of engagement when compared to the traditional classroom in student

engagement; overall, it was only an increase of .20 from the previous measurement in

week four. Compared to week four, the flipped classroom did achieve some areas where

engagement scores were near or higher than the *meeting expectations* score of 3.0.

However, engagement scores from the traditional classroom still fell below this mark.

The graph is a visual presentation of the gap beginning to increase in the two classrooms

in regards to engagement.

In week 12, the gap in engagement between the flipped classroom and the

traditional classroom continued to widen. Both classroom formats displayed growth in

overall engagement; however, the flipped classroom continued the pattern of being more

engaged according to the engagement matrix. The flipped classroom experienced a mean

increase of .43, compared to a .27 increase in the traditional classroom, further increasing

the cumulative mean of 2.88 for the flipped classroom and 2.31 for the traditional

classroom. The data recorded by the researcher in week 12 are presented in Table 3.

Table 3

Week Twelve Engagement Data

	In-Class Participation	Student & Instructor	Peer Engagement	Student Attentiveness	Student Preparedness	*M*
Flip.[a]	3.46	3.31	3.15	3.38	2.85	3.23
Trad.[b]	2.75	2.5	2.25	2.25	2.5	2.45

Note. M = Mean Score Total Student Engagement Week Twelve. [a] Flipped Classroom. [b]

Traditional Classroom. A score of 3 is considered meeting expectations.

In-class participation showed nearly a one-point growth for the flipped classroom,

compared to the traditional classroom, which only experienced slightly over .50 in

growth. Like week eight, the flipped classroom encountered growth in student

engagement with the instructor, while the traditional classroom experienced a decline

from previous measurements in week eight. Week 12 was also the first week in the entire

data collection period when the flipped classroom performed higher in all predictors than the traditional classroom. The data further depict the results observed and measured by the researcher and are illustrated in Figure 3.
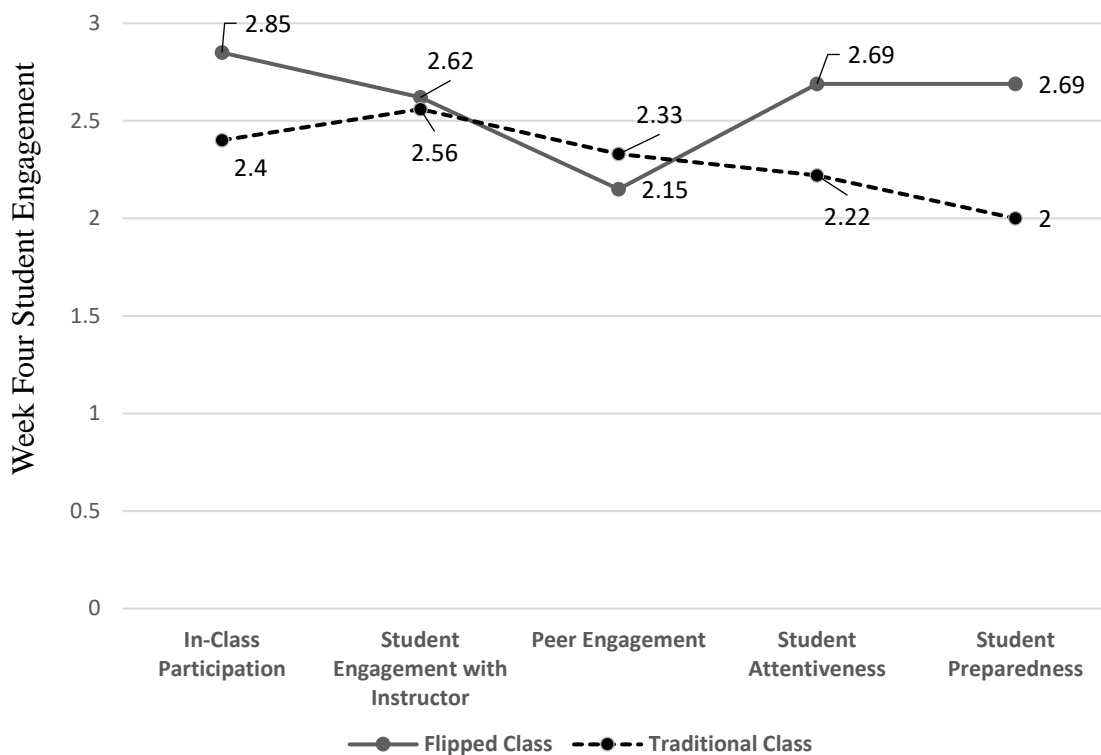

Figure 3. Student engagement results week 12. The solid line refers to the Flipped Class teaching methodology, while the dotted line refers to the Traditional Class. The points represent each predicator being measured for student engagement in week 12.

Since the data collection period during week eight, peer engagement increased in the flipped classroom and decreased in the traditional classroom, reporting a difference of .90 between the two teaching styles. During week 12, the flipped classroom met expectations in all predictors by scoring a three or above, except in student preparedness. The traditional classroom failed to meet expectations in all engagement predictors. Although the flipped classroom had a decrease in student preparedness from week eight,

the flipped classroom was more engaged than the traditional classroom. By the end of the week 12, the overall engagement scores for the flipped classroom continued to show an increase from week eight, increasing from 2.80 to 3.23. Likewise, the traditional classroom reported an increase from week eight, growing from 2.18 to 2.45.

During week 16, (the final week of the semester), students were observed and evaluated over the same predictors as in weeks four, eight, and 12. The data recorded in week 16 reflected a greater difference in teacher recorded engagement scores between the flipped classroom and the traditional classroom. While the average engagement score for the flipped classroom was 3.29, the traditional classroom was only 2.65, resulting in the flipped classroom being rated higher in the areas measured for engagement than the traditional classroom.

The flipped classroom experienced a decrease for the predictor of in-class participation from week 12. A slight gain of .13 was recorded for in-class participation for the traditional classroom. Both the flipped and traditional classroom showed growth in student engagement with the instructor but the flipped classroom still scored higher than the traditional classroom. Peer engagement was also an area both the flipped and traditional classrooms showed growth. The flipped classroom showed progress in growth of engagement of .23. The traditional classroom had a gain of .50. Even with higher gains, the traditional classroom was still lower in engagement than the flipped classroom and was still below a score of three which indicates meeting expectations. The scored predictors for week 16 are presented in Table 4.

Table 4

Week Sixteen Engagement Data

	In-Class Participation	Student & Instructor	Peer Engagement	Student Attentiveness	Student Preparedness	*M*
Flip.[a]	3.31	3.46	3.38	3.23	3.08	3.29
Trad.[b]	2.88	2.75	2.75	2.38	2.5	2.65

Note. M = Mean Score Total Student Engagement Week 16. [a] Flipped Classroom. [b] Traditional Classroom. A score of 3 is considered meeting expectations.

The instructor measured and compared student attentiveness, resulting in a score of 3.23 for the flipped classroom and a score of 2.38 in the traditional classroom. Student preparedness was the last item to be measured by the researcher, and a different result was obtained. The traditional classroom remained consistent with the week 12 score of 2.5 student preparedness, but the flipped classroom experienced growth of .23 in student preparedness, resulting in a score of 3.08. Both teaching strategies encountered growth in student engagement from the beginning of the semester to the end, but the traditional classroom never reached an overall score of 3.0 or higher.

Comparing the beginning of the semester week four, until the end of the semester week 16, the scoring for both the flipped classroom and the traditional classroom showed different patterns of engagement. In week four, the scores for each classroom showed less of a gap between the engagement scores, whereas in week 16, the scores between the two classrooms continued to widen and depict a difference in how I rated the different areas of engagement. The classes seemed to taper off in the levels engagement meaning the

scores obtained by students in each classroom remained relatively consistent. The data
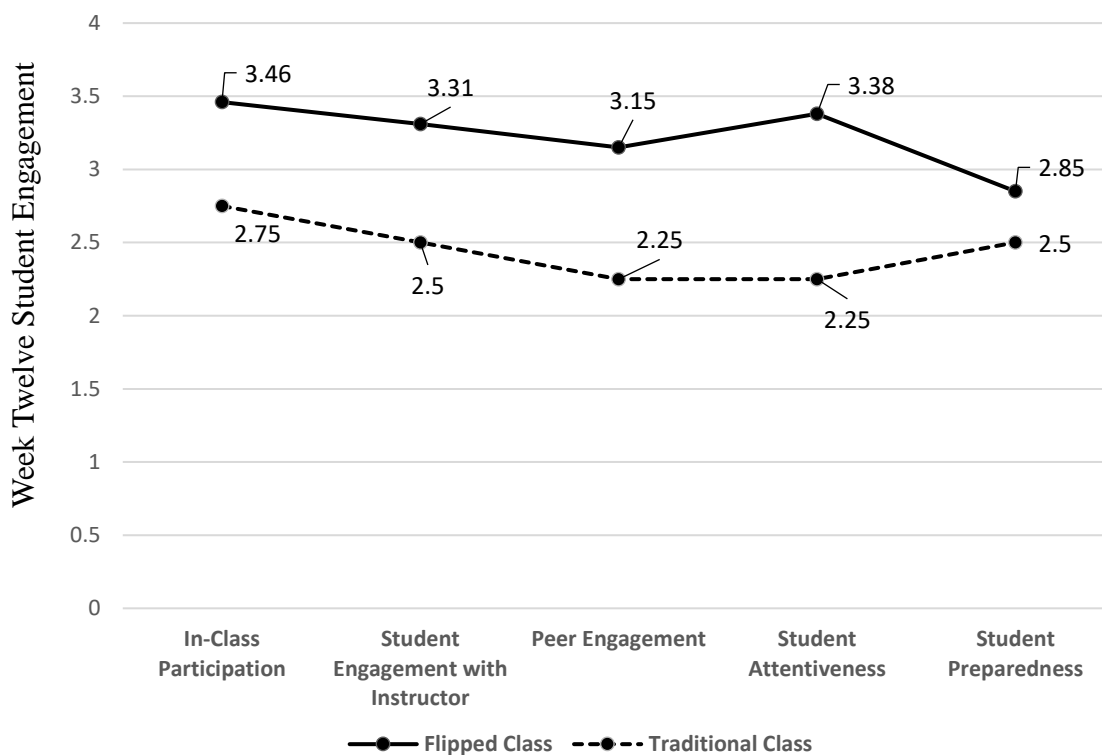
for week 16 are illustrated in Figure 4.
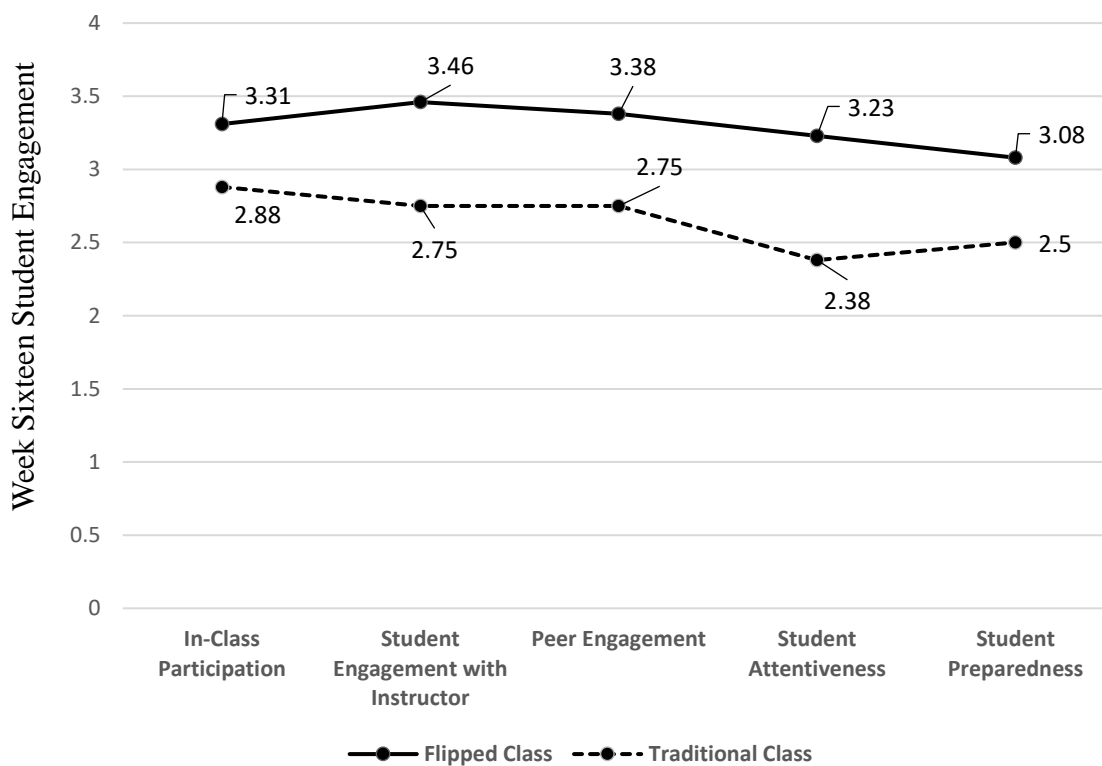
Figure 4. Student engagement results week 16. The solid line refers to the Flipped Class teaching

methodology, while the dotted line refers to the Traditional Class. The points represent each

predicator being measured for student engagement in week 16.

The scores for each area of engagement for the entire 16 weeks were averaged

together to obtain a mean score. The scores are displayed in Table 5. Overall, half of the

scores for the flipped classroom reached a three or above which is indicative of meeting

expectations on the matrix. Two areas, peer engagement and student preparation were

still below the score of three. The traditional classroom while making progress in most of

the areas, was below a score of three in all the areas measured on the matrix.

Table 5

Student Engagement Data for all Sixteen Weeks

	In-Class Participation	Student & Instructor	Peer Engagement	Student Attentiveness	Student Preparedness	*M*
Flip.[a]	3.06	3.04	2.75	3.17	2.89	2.98
Trad.[b]	2.57	2.68	2.42	2.21	2.11	2.40

Note. M = Mean Score Median Engagement Data for all 16 Weeks. [a] Flipped Classroom. [b] Traditional Classroom. A score of 3 is considered meeting expectations.

Overall data from the 16-week semester reflected gains of .58 for the flipped classroom in peer engagement and growth of .62 in peer engagement for the traditional classroom. Peer engagement increased for the flipped classroom, averaging 2.73, with 2.33 for the traditional classroom, which showed no signs of increase from weeks four or eight. Both the flipped classroom and traditional classroom experienced consistent amounts of growth in student preparedness, with a .20 increase in the flipped classroom and .25 in the traditional. Overall, the median for the flipped classroom was 3.00, which was only a slight growth of .41 since the fourth week measurement. The traditional classroom resulted in 2.41, which increased only .10 from week four. The median scores are displayed in Figure 5.
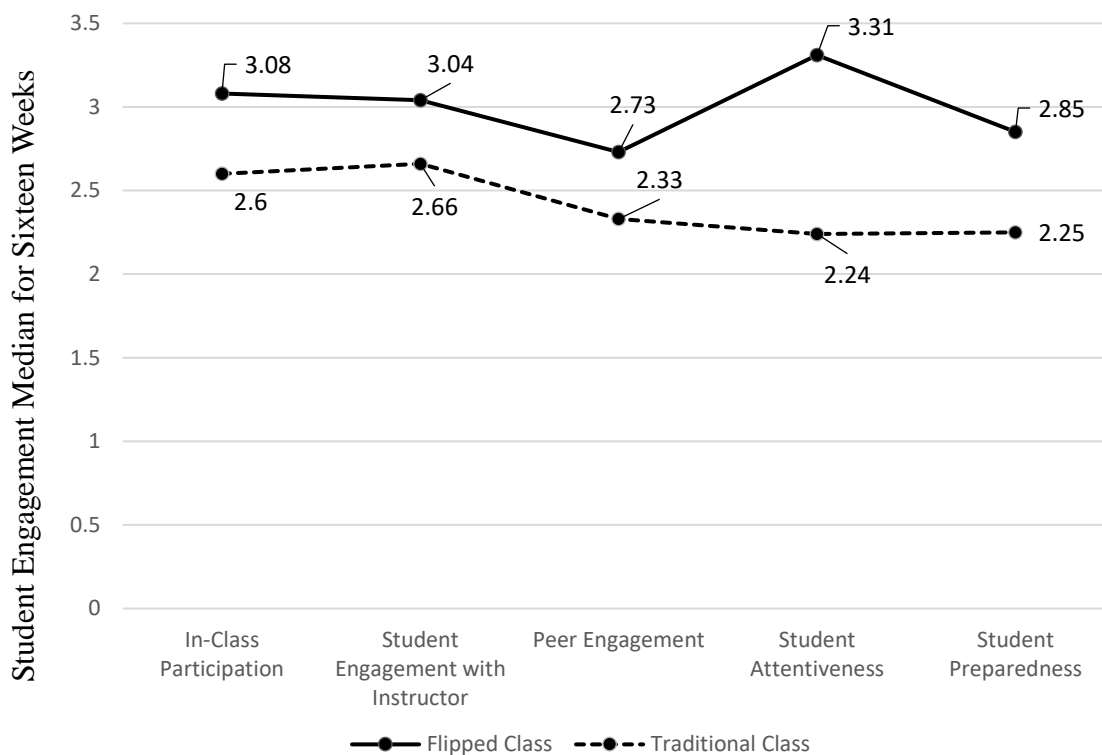
Figure 5. Student engagement for 16 weeks. The solid line refers to the Flipped Class teaching methodology, while the dotted line refers to the Traditional Class. The points represent each predicator being measured for student engagement throughout the 16-week period.

Engagement journal. The engagement journal was created in electronic format, which allowed me to reflect on a consistent set of four questions every four weeks to add validity to the data collected (Hendricks, 2013). The journal was used in both teaching methodologies and responses for each question are summarized in this section.

As a class, how much are the students engaged? This question contained a drop-down selection ranging from *needs direction* to *exceeds expectation* of student engagement. The flipped classroom met expectations in weeks four and 12 and exceeded expectations in weeks eight and 16. Comparatively, the traditional classroom fell below

expectations all four weeks when engagement was measured and evaluated. Based on my observations as the researcher, the difference between the levels of engagement for the flipped classroom and the traditional classroom was group dynamics.

The students in the flipped classroom seemed to be eager to get involved with their learning by taking ownership and working collaboratively together. Students who were struggling were supported, encouraged, and coached by students in the class. In the traditional classroom, the group dynamic appeared to be the opposite. According to the ratings given by the instructor, students did not score well in areas that would be indicative of building classroom community, did not work well as a cohesive group, and were not willing to encourage or support peers who were struggling.

What have I been doing in class today? During the 16-week semester, as the instructor, I was able to become a facilitator of information, coach, guide, and best of all, be a cheerleader. No longer was the role of the instructor someone who stood in front of the students attempting to teach concepts, while keeping the students entertained, engaged, focused, and awake. By delivering all the content to the students through the pre-recorded digital video lessons outside of class, the time in class was spent by the instructor working with students individually and in groups. The flipped classroom teaching methodology allowed instructor-student conferences on a daily, weekly, or monthly basis depending on the need.

Flexibility was built into the flipped classroom schedule, which was not something the traditional classroom was able to do. If students in the flipped classroom were struggling with concepts, more time during class was available to address those concerns, because the material had been presented prior to class. In the traditional

classroom, the content was covered during the class period, so there was limited time to support students who did not master the content.

Arrangements outside of the classroom needed to be made to support additional learning for the students who had not mastered the content. The instructor was also able to use the flexibility of the flipped classroom to identify students who were struggling with mastering concepts and work with them immediately, without disrupting, or delaying the remainder of the students. Rather than moving on and leaving some students behind, the format of the flipped classroom allowed all students an equal education opportunity. Comparatively, the students who were struggling with concepts in the traditional classroom were left behind, because the group moved together whether all students had mastered concepts or not.

In the flipped classroom, the instructor was able to get to know all the students much better individually, but most importantly the students who were struggling. After identifying the students who were struggling, the instructor was able to spend quality time with each student to determine the best learning environments and teaching strategies to benefit the individual student. Not only did this time benefit the students' grades, but it also help strengthen the students' confidence in themselves and their abilities to perform well in class and interact more with other students.

What are my students working on? In the flipped classroom, students spent their time working independently and in groups of varying sizes ranging from two students to the entire class, creating a student-centered learning environment. Meanwhile, the students in the traditional classroom spent each day in a teacher-centered environment, listening to lecture and taking notes. On a typical day in the flipped classroom, students

would begin their day by taking a content quiz over previous night's digital video lesson. Students who did well on the quiz and had viewed the lessons prior to class would move on with their in-class activity folder. Students who did not perform to standards on the quiz or had not viewed the digital video lessons prior to class would be required to watch the lesson before moving onto their next in-class activity.

In the flipped classroom, students would complete homework assignments, quizzes, exams, and varying related learning activities, which further expanded the content of the digital lessons. Students were able to get immediate help and guidance from the instructor when they needed it, rather than waiting until the next day. Because of the digital format of the lessons in the flipped classroom, if students did not complete the activities of the day, they were able to pick up where they left off the following day of class. Students were able to research and master concepts before moving into the lab to apply the concepts, thereby doing better in the hands-on application.

Students in the traditional classroom listened to lectures and only completed quizzes and exams during class time. The traditional methodology did not allow time during class to complete all coursework, which made students responsible for completing assignments outside of class, often resulting in students not fully comprehending the material presented before it was necessary to move on with the course curriculum. The lack of completion of all necessary assignments often led to lower grades in the traditional classroom.

In the flipped classroom, students were able to move forward learning concepts on exam days once they were finished with their exam, because they already knew which activities to complete next, whereas the students in the traditional classroom had to wait

for lecture. Comparatively, the students in the traditional classroom had to wait for their peers to complete their exams before moving on as a group, and if additional time was needed to master a concept, alternative times had to be scheduled. Comparing these two classroom structures in this manner gave both the instructor and students the opportunity to see exactly how much time is lost in the traditional classroom merely waiting, compared to the flipped classroom, where no time is wasted since students already have assigned tasks they can move onto.

General thoughts for the day. This 16-week study of the flipped classroom was quite informative. The class went smoothly, and it was so fulfilling to see how much time was spent one-on-one between the instructor and students. Even dedicating time to each individual student throughout the class, the instructor still found it easy to remain attentive to the remaining class's needs. Additionally, it was noted how much outside class learning the flipped classroom created, since students knew they would have an assessment when arriving to class. The flipped classroom allowed students to move onto other activities, without waiting for the entire class to finish one activity before moving to the next, therefore mitigating the loss of productive class time.

In the traditional class, the students did not prepare well for the daily assessments, which could possibly be an indicator of the lack of outside class learning which took place, even though students were provided the same tools as the flipped classroom. The students in general seemed to present a normal attitude, coming to the traditional class under-prepared. As the participant in the data collection, it was interesting to see how limiting the traditional class methodology can be. Students were unable to move forward

until all students had completed the activity; therefore, it was alarming to see just how ineffective this classroom structure is and how much time was lost in class.

Research question two. *How does the role of the teacher change, if at all, in a flipped culinary arts technical classroom in comparison to the teacher's role in a traditional culinary arts technical classroom?* Data for this research question were gathered two to three days each week for the 16-week period using the reflective journal instrumentation tool created by the researcher specifically for this study.

Reflective journal. The reflective journal was created to allow myself, as the researcher and participant, a method to view what differences exist between the two teaching styles, and how, if at all, those differences change my role as the teacher (Hendricks, 2013). The reflective journal consisted of five guiding questions to be journaled at least three times a week. This section elucidates the findings of each guided question.

What activities did we do? Although both classrooms received or had access to the same basic content, the activities during non-lab class days varied between groups. At the beginning of the semester, each student in the flipped classroom created an activity project folder, which was stored in the classroom. The folder contained all the activities, which would need to be completed throughout the semester, but had no specific deadlines. Additionally, each day the students would receive a small list of 1-3 tasks that were required by the end of that class period.

Students would start by completing the short task list, usually including a digital video lesson quiz to verify whether they viewed the content before class and comprehended what they learned. The quizzes were also designed with the thought that

students would be more prone to view the lessons prior to class, knowing they would be

assessed upon arrival to the classroom the next day (Bergmann & Sams, 2012). Students

would then move directly into working on the activities in their folders of their choice,

creating a student-centered learning environment. Other activities included unit

comprehensive exams covering four to six chapters, weekly measurement quizzes, tasting

lab research activities as both individuals and groups, hands-on activities, chapter

assignments, and one-on-one learning activities, or coaching sessions with the instructor.

The flipped classroom created a structured, yet more relaxed environment, which

promoted meaningful, objective based learning.

The students in the traditional classroom were assigned nightly chapter readings,

and the next day would begin with the same quiz as the flipped classroom. The quiz had

the same intent, which was to verify if the students completed their reading assignments

and if they comprehended the material. The students would then spend the rest of their

class period in a teacher-centered learning environment, listening to lectures, and having

minimal class discussions. The format of the traditional classroom did not allow time to

ensure mastery of content before moving onto the next section.

What went well? While the students were working on individual or group tasks in

the flipped classroom, I was able to circulate throughout the room, monitoring every

student. Additionally, as a participant in the research, I was able to take advantage of this

time to work one-on-one with specific students or each student in the class (Hendricks,

2013; Herr & Anderson, 2015). An example when the flipped classroom format was

successful was the week before the first lab-penalty measurement quiz took place. Since

the lab-penalty measurement quiz would prevent students from participating in the lab, it

was imperative all students passed the quiz. By working with students one-on-one, I was able to identify students who were struggling to master the quiz, which would prevent them from going to lab. This built-in time was different from the traditional class, where the time would not have been available during class time to help struggling students. The support time would have been arranged at alternative times. By having this dedicated time during class, it was beneficial for everyone, especially the students who needed extra support.

Additionally, nearly all students were fully engaged throughout the entire flipped classroom. Students in the flipped classroom were more likely to complete all assigned daily tasks, as well as staying focused on the additional task(s) assigned. As the instructor, I rarely had to give reminders to students to complete homework assignments, since the students generally were able to complete them during class time. Students found discrepancies between the digital video lessons and the answer keys to the quizzes in the flipped classroom, which at first was presented as a negative experience, but upon further reflection, presented as a positive experience, because it meant students were paying attention and learning the material prior to class.

In the traditional classroom, things went well as a group. The students normally stayed on schedule, getting everything accomplished on the daily lesson plan. The attentive students asked many questions and shared many stories. The traditional classroom format did allow a set curriculum content flow to be maintained, meaning it was easy to set a monthly calendar of lesson plans and remain on target to completing those lessons in a timely manner.

What did not go well? From time to time, one or two students had to be refocused to the task they were assigned in the flipped classroom. Students who had not read the chapters or watched the digital video lessons prior to class earned lower grades than the students who arrived to class fully prepared. Some students did not have internet access outside the classroom, and as an oversight on the instructor's part, the DVD copies of the digital lessons were not available for the first two lessons. Students had to rely on the traditional learning mode of reading, which for the most part they chose not to participate, leaving them underprepared. During the first class period for the flipped classroom, I noticed a loss of time due to students waiting for others to complete their work before they could move on. Seeing this transition as not an effective use of class time, I revisited the structure and made more productive use of the class period.

In the traditional classroom, students were not engaged as fully as they could have been. The students who were fully engaged asked many questions and shared many stories, resulting in material that had to be eliminated to ensure the main points of each chapter were covered by the end of the class period. Many students exhibited normal student study habits and were not reading the chapters or slide presentations prior to arriving to class, therefore earning low grades on the quizzes.

Due to the lack of engaging opportunities during the traditional classroom, some students were so unengaged, they were fighting to stay awake. Although unengaged in lecture, students used various activities to help keep themselves from causing class disruptions by drawing pictures, organizing binders, pulling out cell phones, or having sidebar conversations during lecture. Additionally, in the traditional classroom, many

students were not completing their homework assignments at all or were submitting them partially completed.

Were there any surprises? The most significant surprise was how much work the flipped classroom entailed, as compared to the traditional classroom format, at least in the launch period. The amount of time spent creating meaningful learning activities to enhance the course objectives proved a challenge. Multiple times the planned activities ended up not producing the results they were intended to, and the students felt they took nothing away from those particular lessons.

As the instructor, I found when a student problem would arise in the flipped classroom, it was easier to find a colleague to come in and observe the class, while I took care of the situation, since all students had the ability to complete tasks on their own, or in groups. Additionally, a few students mentioned they really liked the soft background music in the digital video lessons. I noticed how much flexibility, overall, there was in the flipped classroom and how much more productive and meaningful the in-class time became with the new student-centered learning environment. The ability to truly connect with all students and build stronger relationships was another component I noticed occurred.

In the traditional classroom, handling student problems was not as easy, because either the person replacing me would have to lecture material they were unfamiliar with, or just give the students busy work while I was away. Neither alternative offered the most appropriate use of the students' learning time. Additionally, it was eye opening to me as the instructor to see how much time was lost throughout the duration of the semester by

simply waiting for all students to complete assigned tasks before being able to move onto the lecture, whereas in the flipped classroom, this down-time did not exist.

Even though I always make attempts to get to know my students as much as possible, by participating in both teaching methodologies at the same time, I realized how impersonal the traditional classroom could be compared to the flipped classroom. There was one profound difference between the classroom modalities when it came to getting to know the students. I found it was attributed to the copious amount of one-on-one time I had with the flipped classroom students on a daily basis and the lack thereof in the traditional classroom. I was able to speak with each student each day in the flipped classroom, compared to the traditional where the communication would be limited to the students who fully participated in lecture. The traditional classroom is a more structured, sterile, and unengaging environment. It is almost as if it could be described as all business and no fun in order to complete all required content each day.

There were times in the traditional classroom I found the necessity to quasi-flip the classroom due to the amount of students who were struggling to remain caught up with the higher performing students in the class. Since there was little to no quality time in the traditional classroom, I was unable to spend a lot of time working with struggling students. Quasi-flipping the traditional classroom allowed me to work individually with a few students to catch them up to speed on the content and kept the remainder of the students engaged and learning at the same time. Furthermore, I found myself constantly reminding students, at least once or twice daily, to complete their homework assignments each evening. During the days when the traditional classroom was able to benefit from the quasi-flip, more students completed their assignments compared to the normal

traditional classroom days where homework was assigned for the evening, and many students did not complete it.

What would I change, or do differently? In the flipped classroom, the student folders of in-class learning activities needed to be setup within the first week of classes, if not prior to the start of the semester. Because of the difference in how the class time was used, more time was needed to create extra activities ahead of time, in the event the planned activities did not deliver the objectives as planned. In addition, all digital materials needed to be available from the first day of the course.

There were a few activities in the flipped classroom that would be teacher-centered, which required everyone to be attentive to the same thing. The first day these activities were scheduled, the activities were placed at the end of the class period. The downside of placing these items at the end of the class period were students lost their train-of-thought on the task they were completing, and some students would not remember to finish the task they were working on once the teacher-centered activity was completed, therefore earning lower scores. Another concern arose when students did not independently move to another task. This was noted by the instructor as a loss of valuable class time.

After noticing this, I quickly determined teacher-centered activities at the end of the class period would not work and was a misuse of classroom time. I found placing those activities at the beginning of the class prohibited any misuse of time due to the fact students could immediately begin working independently, or in small groups, without interruption or wasted classroom time at the end. An example of this would be an exam review. When giving a unit assessment, every student was required to finish before we

would move onto the next activity, which was generally a huge time loss. I found by providing the exam review first, the students went right into their exam, and then instead of losing time when they finished their exam waiting for everyone else to finish, they were able to move right on to the next task, so no time was lost.

Research question three. *What perceptions do students in a culinary arts technical flipped classroom possess in regards to their learning?* Of the 13 students in the flipped classroom who were invited to take the survey, all 13 students chose to participate. Many of the questions allowed students to check multiple items and responses. In most questions, the options of *all the time*, *sometimes*, *a few times*, and *none of the time* were offered. Some questions provided specific answer choices to the students, and other questions allowed the students to rate their experience with different flipped classroom aspects. An example rating was *most effective*, *effective*, *somewhat effective*, and *least effective*.

Survey question 1. Did you view the digital lessons prior to class as assigned? All 13 students responded to this question. Twelve students stated they viewed the lessons prior to class *sometimes*, and two students only viewed the lessons prior to class a *few times*. No students responded they had viewed the digital lessons *all the time,* and none of the students reported not viewing the digital lessons at all.

Survey question 2. Did you view the digital lessons more than once? Thirteen students responded to this survey question. Only three students reported viewing the digital lessons more than once *all the time*. Six students reported viewing the lessons multiple times *sometimes*. Four of the students reported in their responses they viewed

the digital lessons more than once *a few times*. No students reported viewing the digital lessons multiple times *none of the time*.

Survey question 3. How many digital lessons did you view? Out of the thirteen students who responded to this question, six students reported viewing 6-10 of the digital lessons, while an additional five students reported viewing 11-15 of the digital lessons. Of the remaining students, three students purported viewing 16-20 digital lessons. No students reported they watched over 20 of the videos. Lastly, all students watched at least one digital video lesson throughout the semester.

Survey question 4. If you answered none of the time to question one, briefly explain why you did not view the digital lessons. This question was an extension to question one. Since all students reported viewing the digital lessons, no data were obtained from this question.

Survey question 5. Where did you view the digital lessons? All students responded to this question, and some provided multiple responses. Only one student reported watching the digital lessons on the *school bus*. Six students watched the lessons *at home*, and one student viewed the lessons at a *friend or relative's house*. Most of students, reported viewing the lessons *during class*. No students watched the videos while *riding in a car* or reported not viewing the lessons at all.

Survey question 6. Would you like to see more digital lessons incorporated into the course? Eighty-four percent of students responded favorably to survey question six; they would like to see more digital lessons incorporated into the course. Of the remaining students, responses were evenly split. Eight percent of students reported they would not like to see more digital lessons, and 8% provided no response.

Survey question 7. *Did you find the digital lessons helpful?* All thirteen students responded to this question. Only 15% reported finding the lessons helpful *all the time*. The largest majority of students, 77%, found the lessons helpful *sometimes*, and the remaining 8% reported finding the lessons helpful *a few times*. No students reported the lessons not being helpful.

Survey question 8. *Did anyone view the digital lessons with you?* This question was designed with the intent to learn about who is sharing in the students' learning process outside the classroom. All students responded to this question. None of the students reported they viewed the digital lessons with anyone else.

Survey question 9. *If you answered yes to question eight, who watched the digital lessons with you?* This question was designed for the purpose of finding out how much or how little parents or guardians were involved in the students' learning process when the lessons were delivered at home. Since none of the students answered yes to question eight, there were no responses given to this question.

Survey question 10. *If you answered yes to question eight, did they find the digital lessons educational and worthwhile?* The intent of this question was to learn other viewer's perceptions of the flipped classroom and create awareness of this type of teaching methodology. Again no responses were provided to this question, since all students answered no to question eight.

Survey question 11. *What elements of the digital lessons were most effective?* This question allowed the students to rate the effectiveness of the digital lessons. Only one response to each predictor was allowed, and all 13 students responded. The outcomes for this survey question were fairly distributed across the predictors and ratings. The

highest majority of students rated their experience *most effective* or *effective*, in most of

the predictors. One low scoring predictor was regarding parental involvement, which was

rated *somewhat effective* and *least effective* by most students. Two other standout

predictors were rated *somewhat effective* for helping the students understand the material

prior to class, and watching the digital lessons ensured assignment completion. Table 6

outlines the responses from students indicating their perceptions of each element of the

flipped classroom.

Table 6

Survey Question 11

	Most Effective	Effective	Somewhat Effective	Least Effective	No Response	Total
Helped me understand the material prior to attending class	23%	46%	31%			100%
Being able to pause and rewind the digital lessons helped me learn more effectively	62%	23%	15%			100%
Allowed my parents to be more involved in my education		08%	54%	38%		100%
The extra information provided throughout the lessons	23%	54%	23%			100%
Watching the digital lessons outside of class ensured I completed all my assignments done during class	15%	54%	31%			100%
Familiar face in the digital lesson made the lesson more real	46%	38%	08%	08%		100%

Note. In this table, student perceptions rating the effectiveness of the elements for the flipped

classroom are provided. Thirteen students (n = 13) participated in the survey.

Survey question 12. *What, if any, changes would you make to the digital video*

lessons? This open-ended question was designed to allow students to provide their

perceptions of the digital video lessons without guided responses. Students responded

they would like to see more hands-on cooking demonstrations and to have key concepts

underlined in the digital lessons would be a positive change. Five students noted the

digital lessons need no changes.

One student stated the digital lessons needed to be a shorter, and another student stated the lessons needed to be provided on DVDs for those without internet access at home, which were offered to students at the beginning of week two. The final student response posited:

> Honestly, the videos are amazing. The content in them was presented in a very easy to understand and very real manner. Rather than just have the book tell you the information, the videos would tell you the information, and if it was a hard topic to understand, there would be an example the students can relate to.

Survey question 13. *Rate the effectiveness of the elements of the flipped classroom.* This question allowed students to rate effectiveness on the same scale used in question 11. All students responded and were only able to select one rating per descriptor. The majority of students rated their experience with these predictors in survey question 13 of the flipped classroom as *most effective.* Laterally, nearly 50% of students did not respond to the predictor regarding instructor demo time. Students providing their perceptions of the elements of the flipped classroom as *effective* and *somewhat effective* were more evenly split in most predictors. Many students found the elements of the flipped classroom to be a positive experience. The responses from the students are presented in Table 7.

Table 7

Survey Question 13

	Most Effective	Effective	Somewhat Effective	Least Effective	No Response	Total
More interaction time with my instructor	70%	7%	23%			100%
The freedom to work at my own pace	54%	39%	7%			100%
Ensured I completed and turned in all of my assignments on time	70%	15%	15%			100%
Gave me more opportunity to ask questions in class	70%	23%	7%			100%
Kept me more engaged during class time	70%	15%	15%			100%
Allowed the instructor more time to demonstrate specific skills	23%	15%	15%		47%	100%

Note. In this table, student perceptions rating the effectiveness of the elements for the flipped classroom are provided. Thirteen students (n = 13) participated in the survey.

Survey question 14. *Would you recommend the flipped classroom learning environment to friends?* Twelve of the 13 students responded to this question. The 12 students reported they would recommend the flipped classroom to other students. One student did not provide a response.

Survey question 15. *If you answered no to question 14, why not?* This question was designed to determine the reasons students would not recommend the flipped classroom. No students responded to question 14 by stating *no*, so there were no responses provided for this question.

Survey question 16. Do you feel you did better academically in the flipped classroom as compared to a traditional classroom? All students responded to this question. Of those students responding, 92%, which was the majority of students, felt they did better academically. This left only 8% reporting they did not feel as though they did better academically in the flipped classroom as compared to the traditional classroom.

Survey question 17. Do you feel the flipped classroom engaged you more than a traditional classroom? All 13 students responded to this question by answering they felt the flipped classroom *engaged them more* than the traditional. Additionally, one student purported both *yes and no* to the level of engagement. The student felt the flipped classroom *engaged them in some aspects* more than the traditional classroom and not as much in other aspects.

Survey question 18. How much time on a weekly average did you spend viewing the digital lessons? Fifty-four percent of students reported spending under one hour a week on average watching the digital lessons. Forty-six percent of the students reported viewing the lessons 1-5 hours a week.

Survey question 19. How did the flipped classroom effect your outside of class workload? All students participating in the survey responded to this question. The majority, or 69%, of students elucidated the flipped classroom decreased their workload outside of class. Comparatively, 31% felt the flipped classroom had no effect positively or negatively on their workload outside of class.

Survey question 20. How often did you encounter barriers which kept you from being academically successful throughout the semester? All students responded to this question, and none reported encountering barriers *all the time*. Students reporting they

encountered barriers *sometimes*, totaled 47%, and 15% reported encountering barriers only a few times. Thirty-eight percent of student reported never experiencing barriers throughout their learning.

      Survey question 21. *What barriers did you encounter?* Not all of the students responded to this question. Trouble accessing the digital lessons on a regular basis was identified as a barrier by 47% of the students. Not having enough time outside of class to view the digital lessons was noted as a barrier by 22%. Thirty-one percent of the students did not provide a response to this question. Additionally, all students reported their class-time was structured well enough for them to learn and there was enough interaction with the instructor during class-time.

      Research question four. *What aspects do students in a culinary arts technical program report as support or as potential barriers for their learning in the culinary arts technical flipped classroom?* This question was designed to summarize the items throughout the survey that supported student learning. This research question also outlined the barriers which prohibited effective student learning.

      Support. Many students reported support for their experience in the flipped classroom came from having more one-on-one quality time with the instructor. Being able to work at their own pace increased their academic success in the flipped classroom. Students purported being in the flipped classroom supported their learning better by having more time during the class period to ask questions and felt the flipped classroom structure engaged them more than the traditional classroom. Overall, combining all of these previously mentioned aspects of support in the flipped classroom allowed the majority of students to do better academically in the flipped classroom as compared to the

traditional classroom. A vast majority of the students noted the flipped classroom supported them positively, because the teaching format decreased the amount of workload they had outside the classroom.

Barriers. Not all students had regular access to the internet outside of the classroom. Limited access to the internet made it a challenge for the students to view their digital lessons prior to attending class, which often resulted in lower grades. Students stated not having the lessons on DVD at the beginning of the semester prohibited them from viewing the first couple of lessons, since they did not have internet access to view the digital lessons.

Other students reported having regular internet access outside the classroom but felt they did not have enough time to view the digital lessons. Some students felt the digital lessons were too long and more of the important information in the lessons should be called out to better emphasize their importance. A large majority of students elucidated having trouble accessing the digital lessons on a regular basis in general.

Research question five. *What differences exist, if any, in student academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical education classroom, as measured by end of course grades?* For this piece of data collection, the de-identified, end of semester grades were analyzed using statistical analysis. Specifically, a two-tailed *t*-test was used (Bluman, 2009).

The mean score for end of course grades for the flipped classroom was 80.90. For the traditional classroom, the mean score for end of course grades was 77. In order to be considered significant, a *P*-value score of .05 or less needed to be obtained. After

analysis, the *P*-value was found to be 0.3771, which is greater than .05. Thus, there was not sufficient evidence to indicate a significant difference between the end of course grades for the flipped classroom and the traditional classroom. The null hypothesis of research question five was not rejected.

Summary

The data recorded throughout the 16-week semester study are summarized in this chapter. All five research questions are answered in conjunction with the data collection instruments created for each question. Due to this research being an action-based methodology, the researcher was also a participant in the study (Hendricks, 2013; Herr & Anderson, 2015). The instruments created and used for this chapter were an engagement rubric, allowing the instructor to more accurately measure student engagement, and report these measurements in the engagement matrix. The engagement journal allowed the instructor to answer the same questions regarding student engagement every four weeks of the study, whereas the reflective journal asked the same questions regarding daily activities at least three days each week. The engagement rubric and matrix, engagement journal, and reflective journal provided the answers to research questions one and two.

The student participants were asked to complete a post-course student perceptions survey, which provided the answers to research questions three and four. On this survey were specific questions on various aspects of the students' perceptions of the flipped classroom, as well as giving the students the opportunity to rate effectiveness of different tools and the opportunity to personal input in an open-ended format. End of semester

grades were gathered to be statistically analyzed to answer Research Question Five. The

findings, recommendations for future research, and implications of this research are

reported in Chapter Five.

Chapter Five: Summary and Conclusions

Although the flipped classroom is not a new teaching methodology, limited data have been located outlining the impact the flipped classroom has on student engagement and academic success in a technical college program. This study was designed so data could be collected in a Culinary Arts Technical Education program to aid in decision making about the differences in the flipped classroom and traditional classroom teaching methodologies, student engagement, and academic success.

In Chapter Five, the findings outlining the data collected for all research questions in the study are presented. Each research question is summarized in this chapter. The data reported were obtained through action-based research, where the researcher plays a dual role as both researcher and participant (Hendricks, 2013; Herr & Anderson, 2015). Additionally, the researcher is able to write from the first person perspective in action-based research (Hendricks, 2013; Herr & Anderson, 2015).

The next section in this chapter contains the conclusions for each of the research questions in the study. The conclusions allow the researcher to provide support for or against the findings from the study, as compared to research gathered in Chapter Two. Implications for practice provides the reader with an opportunity to learn from the procedures followed in this study and to make adjustments and changes to the research process. Implications also give the researcher the chance to outline idealistic scenarios, which could alter future outcomes. After completing the research, the potential for gaps in the research are suggested, and ideas for future research on the flipped classroom are considered.

Findings

      Research question one. *How does the level of engagement, as measured by the engagement rubric, differ for students in a traditional culinary arts technical classroom, as compared to students in a flipped culinary arts technical classroom?* For this research question, I wanted to be able to monitor and evaluate student engagement in a flipped classroom and compare it to a traditional classroom to see if there was a difference in levels of engagement. To collect these data, two tools for measuring engagement were created and utilized. The first was an engagement matrix, which allowed a consistent measurement of student engagement. In addition, an engagement journal was also created, where the same questions were answered by the instructor each day regarding the overall classroom engagement, which is a meaningful action-based research data collection tool (Hendricks, 2013; Herr & Anderson, 2015).

      The engagement matrix contained five predictors measuring different aspects of student engagement. Each predictor was scored on a scale from one to four, where one was *below expectations*, to four, *consistently exceeds expectations*. Each student was scored individually, and the score was recorded into a spreadsheet and then averaged.

      The matrix was utilized during weeks four, eight, 12, and 16, and was explained in detail in Chapter Four. The engagement journal contained one rating question, collecting data on overall class engagement, and three open-end questions allowing observations to be recorded on teacher and student engagement. This tool was utilized the same weeks as the engagement matrix.

      Overall, the engagement matrix was simple to use and allowed a measureable and consistent means to collect data regarding the levels of engagement among students in the

classroom. The matrix put classroom format and teaching strategies into perspective and provided insight to how all students learn differently and in different environments. Final results of the engagement matrix reflected relatively even distribution of scores, with the exception of *student attentiveness* and *student preparedness*, which were most often reported with higher scores for the flipped classroom and lower scores for the traditional.

The engagement journal offered an opportunity to reflect on the week and provide feedback to myself, not only as the researcher, but as the participating instructor in the study (Hendricks, 2013; Sagor, 2011). The journal required me to answer the same four questions and were to be answered every four weeks throughout the study. The first question was measured by selecting one of the same predictors used in the engagement matrix. The remaining three questions were open-ended, allowing the instructor the opportunity to provide subjective and objective responses. The engagement journal provided the researcher the opportunity to recognize the ineffectiveness of some teaching strategies in both flipped and traditional classrooms and to make adjustments to better enhance the learning environment.

Research question two. *How does the role of the teacher change, if at all, in a flipped culinary arts technical classroom in comparison to the teacher's role in a traditional culinary arts technical classroom*? This question was created to allow the instructor the opportunity to reflect on his own teaching practices and know where to make changes or adjustments for future lessons and activities. This research question was also designed to help answer questions for future educators interested in flipping their classrooms to see how much work was involved and how the role of the educator does, in fact, change.

The tool used to collect these data, was the reflective journal, which was created and utilized by the researcher. According to Hendricks (2013) and Herr and Anderson (2015), journals are an effective action-based, qualitative component to data collection. The reflective journal was employed a minimum of three days a week, each week of the study, by the instructor. The journal contained five questions, allowing the instructor to provide open-ended feedback each day regarding his own teaching practices and what, if any, changes would be necessary to teaching practices. The journal also provided the instructor the opportunity to compare effective and ineffective teaching methods.

The reflective journal allowed me to actualize many differences as an instructor in a flipped classroom and a traditional classroom. Being able to take notes about activities that were successful, or not, was quite beneficial. In a normal class situation without reflection built in, it is standard to move on without giving much thought to changes. The reflective journal allowed reflection, feedback, and time to adjust or change one's own teaching practices (Hendricks, 2013; Sagor, 2011).

Research question three. *What perceptions do students in a culinary arts technical flipped classroom possess in regards to their learning?* This research question was designed to provide students with the chance to provide feedback to the instructor. The tool created and utilized for this research question was a survey, another tool used in action-based research to collect data (Hendricks, 2013; Herr & Anderson, 2015). It was the desire of the researcher to learn the perceptions students had of the flipped classroom without them feeling intimidated to answer freely.

The survey was designed with 21 questions, all attempting to collect specific data (Hendricks, 2013; Herr & Anderson, 2015). Some questions were designed in a closed-

ended format to ensure specific elements of the flipped classroom were addressed in a quantitative means (Hendricks, 2013; Sagor, 2011). Other questions were designed in more of an open-ended format, which allowed the students to provide additional perceptions not outlined in the survey (Hendricks, 2013; Sagor, 2011). A link to the survey was emailed to each student asking him or her to participate.

Each student participated by completing the survey, and their anonymity was protected since there was no identifying information in the survey. The majority of students answered every question, with the exception of two questions. The data from the survey were explained in detail in Chapter Four. In an abbreviated overview of the survey, students were asked to reflect on their participation with the digital video lessons, such as how many videos they watched, how many times they watched the videos, and where they generally watched the videos. Students were also given the opportunity to provide feedback to the instructor through closed-ended and open-ended questions. Feedback provided from these survey questions was used to help the instructor make the necessary changes to the content and delivery methodology. Students were also asked if anyone watched the digital video lessons with them, for the desired outcome of determining how much or how little parental involvement would take place in the flipped classroom since lessons could be viewed at home. In general, there were no surprises with the collected data, in fact it seemed as though the majority of students enjoyed their experience with the flipped classroom.

Research question four. *What aspects do students in a culinary arts technical program report as support or as potential barriers for their learning in the culinary arts technical flipped classroom?* The purpose of this question was to concentrate specifically

on two areas of the survey, support for the flipped classroom and barriers students encountered while attempting to participate in the flipped classroom. Data collected from this question also provided the researcher/instructor the opportunity to reflect on classroom practices.

The same survey designed and distributed for research question three was used for this question. Although the same survey was used, the focus for this research question was to find a more profound meaning of the responses from each student. Not surprisingly, there were more areas students felt supported their learning in the flipped classroom. Only a few areas created somewhat of a barrier. One piece of datum, which stood out in support of the flipped classroom, regarded the level of preparation and engagement a student felt in regards to the flipped classroom. In contrast, a few students reported their most significant barrier to the flipped classroom was the inability to access the internet on a regular basis.

After participating in the study with the students and gathering the data for this research question, it does seem the component of the flipped classroom that acts as a barrier to the majority of the students is the internet accessibility. Although students without internet were provided a DVD with all lessons and supplements, which could be played in a computer, gaming system, or DVD player, it does seem not having regular access to the internet is troublesome to some students. Students were given all the time they needed during class to complete their assignments for both individual and group activities, but some students without internet wanted to be able to access those assignments outside of class to work ahead in the material to be better prepared for in-class activities.

Research question five. *What differences exist, if any, in student academic performance in a traditional culinary arts technical education classroom, as compared to students in a flipped culinary arts technical education classroom, as measured by end of course grades?* Research question five was created in a quantitative nature to provide the researcher/instructor a side-by-side quantitative comparison of a flipped classroom and a traditional classroom. The desire was to learn if there was a statistically significant difference between the two teaching methodologies. Data from semester grades were analyzed.

De-identified, end of semester grades from both the flipped classroom and traditional classroom were used. The information was then reported in a two-tailed *t*-test (Winter, 2013). By percentage, the flipped classroom performed nearly 4% higher than the traditional classroom. Both classroom formats also achieved a 75-80% grade average class wide. When statistically analyzed, the scores in the flipped classroom, when compared to scores in the traditional classroom, were not statistically different from each other.

Conclusions

In this section, the findings of this study are discussed in relationship to the literature reviewed in Chapter Two. In order to provide a comprehensive discussion, the researcher made every attempt to report perspectives for both affirmations and disapproving outcomes of the flipped classroom (Hendricks, 2013). The conclusions are discussed by research question.

Research question one. *How does the level of engagement, as measured by the engagement rubric, differ for students in a traditional culinary arts technical classroom,*

as compared to students in a flipped culinary arts technical classroom? Engagement varied between each teaching modality. Overall, students who participated in the flipped classroom seemed to score higher, on average, than the students in the traditional classroom (Tune et al., 2013). The level of student engagement and in-class participation with each other and the instructor were also higher in the flipped classroom than the traditional classroom. These findings were similar from those of Solozhenko (2015). In most weeks, students prepared more in the flipped classroom by watching the digital video lessons knowing they would have a mastery quiz upon arrival to the class the next day (Fulton, 2012; Hamden et al., 2013).

Research question two. *How does the role of the teacher change, if at all, in a flipped culinary arts technical classroom in comparison to the teacher's role in a traditional culinary arts technical classroom*? In agreement with Goodwin and Miller (2013) and Bergmann and Sams (2012), the role of the teacher does become more of a coach or guide to the students in the flipped classroom. Providing additional support to the misconceptions regarding the role of the teacher elucidated by Enfield (2013), the role of the teacher is not diminished, in fact in this study, the teacher became even more involved with the content and the students than before. Additionally, the flipped classroom created a Socratic level of thinking incorporating engagement, meaningful discussions, assessments, observations, and immediate feedback opportunities (Hamdan et al., 2013). As the instructor in this study, I was able to remove myself from the front of the classroom, where a teacher is traditionally, and move throughout the classroom, monitoring and coaching students, accordingly (Fulton, 2012; Goodwin & Miller, 2013).

Bergmann et al. (2012) noted a common misconception was the flipped classroom would replace the teacher with videos, and there would be limited involvement from the teacher. In this study, as the instructor, I actually became more involved with the students, because the main concepts of the content were already taught prior to arriving to class. I could elaborate further on those concepts during class time, actually elevating my involvement as the instructor. According to Rath (2014), the flipped classroom allowed the teachers to have more academic freedom and innovation in the classroom, which also increased their involvement.

Throughout the study, the theory of Kagan and Kagan (2014), visions, came to fruition. Circulating throughout the classroom, gave the instructor the opportunity to determine which learning styles and environments worked best for each student, corresponding with the matching vision (Kagan & Kagan, 2014). Having one-on-one time with each student in the flipped classroom connected to Kagan and Kagan's (2014) stretching vision, allowing the student and instructor quality time to expand on concepts in different ways and to give the student a larger opportunity to grasp concepts. Finally, the flipped classroom methodology allowed the instructor to become a cheerleader and celebrate the student successes, no matter how large or small, which coincides with Kagan and Kagan (2014) vision of celebrating.

Throughout the study, the instructor was able to evaluate the strengths, weakness, and personalities of each student. This was a beneficial in assessing the individual learning needs of each student. In agreement, Gardner (2011) noted how beneficial this type of assessment is to teachers, since much of human learning is derived from cognitive measured characteristics.

Research question three. *What perceptions do students in a culinary arts technical flipped classroom possess in regards to their learning?* Arguing the misconception posited by Tune et al. (2013), who noted students expressing they had an increase in outside of class workload, students in this study felt they experienced a decrease in outside class workload. Enfield (2013) noted the majority of students did not find the digital video lessons for the flipped classroom helpful. Comparatively, in this study, the majority of students stated the digital video lessons were helpful, in fact, 84% of students in this study stated they would like to see more digital video lessons incorporated into the classroom. These findings were in agreement with Goodwin and Miller (2013) as many students enjoyed the ability to pause and rewind the digital video lessons, which enhanced their comprehension of the content. A large percentage of students in this study enjoyed having the familiar face of their teacher in the digital video lessons at home, which was similar to the students noted by Brunsell and Horejsi (2013), who felt as though the digital lessons allowed them to take their teacher home to learn on their own.

In all measures of student perception of the flipped classroom but one, at least 77% of students rated their perceptions of the flipped classroom as *effective* or *most effective*. Students felt the structure of the flipped classroom allowed more interaction, one-on-one time with the instructor (Bergmann et al., 2012). The students enjoyed the ability to work at their own pace and had more time to ask questions (Evseesa & Solozhenko, 2015; Gullen & Zimmerman, 2013). Similar to the findings of Goodwin and Miller (2013), students felt the flipped classroom kept them more engaged and ensured

they completed all their assignments on time, which both resulted in better academic performance.

  Research question four. *What aspects do students in a culinary arts technical program report as support or as potential barriers for their learning in the culinary arts technical flipped classroom?* In this study, there was evidence to support what was found in the research from Chapter Two. The survey results from this study showed students felt their course workload decreased in the flipped classroom format. Tune et al. (2013), found similar results when he reported students reported being happy with their decreased workload outside of class time. In agreement with Bergmann et al. (2012), students' responses noted how one-on-one time with the instructor made a positive impact on their grades. The one-on-one time for the students and instructor illustrated the utilization of one of Gardner's (2011) multiple intelligences: interpersonal learning.

  Some students found it difficult to access the lessons on the internet regularly, and other students had no regular access to either a computer or the internet. As Ullman (2013) purported, providing those students with DVDs of the digital video lessons would prevent this common barrier. The students' access situations must have changed throughout the semester, because a few students reported not being able to access the internet, and they did not have the DVDs to view the lessons. The DVDs were available from the second week of class until the end of the semester.

  Other students who had internet access felt they did not have enough time outside of class to view the digital lessons. The length of some digital video lessons prevented some students from staying engaged, and other students mentioned the need for more emphasis placed on the imperative concepts. Herreid and Schiller (2013) noted digital

lessons posted on formats such as YouTube could cause students to lose focus and force

them to sit through unrelated commercials, with the end result of not absorbing the

material. This study avoided using all of the previously mentioned formats by Herreid

and Schiller (2013). The videos were created using Camtasia, and the digital video

lessons were posted in the students' learning management system, accessible through

their school web-portal or on DVD.

        Research question five. *What differences exist, if any, in student academic*

performance in a traditional culinary arts technical education classroom, as compared to

students in a flipped culinary arts technical education classroom, as measured by end of

course grades? Although not statistically significant, the grades in the flipped classroom

were nearly 4% higher than those in the traditional classroom. Hamdan et al. (2013) and

Brame (2013) also noted students reporting higher grades during and at the end of

semesters. Allowing the students to utilize technology in the classroom during this study

also had a positive effect on their grades, which is similar to Brame's (2013) findings.

Implications

        After reflecting on this study, the implication which stands out the most is the

environment, ensuring the traditional classroom is not recreated merely with added

technology. Providing access to the content is vital to the success of the flipped

classroom (Bergmann & Sams, 2012). Providing access alone is not enough. Student

engagement needs to be addressed so students will want to actively learn and excel

academically (Fulton, 2012; Kim et. al., 2014). Teachers should make the videos as fun

and interactive as possible to avoid just recreating a classroom lecture on video (Pearson,

2014).

In an ideal flipped classroom setting with a lab component such as the one in this study, it would be beneficial to have free access to both lecture and lab rooms, as well as instructor availability. The level of student engagement and academics could significantly increase by using both components simultaneously. Ideally, students who prepared properly for class would advance to lab upon passing their chapter comprehension quiz at the beginning of class, as they have displayed mastery of the content (Cargile & Harkness, 2015).

Students who did not pass the written requirements would stay in the lecture room, re-watching the digital video lessons and working on supplemental in-class activities to help them comprehend the content in the chapter until they could master their quiz, then advance into the lab. Perhaps if students knew this would be the result of preparing properly before class, more students would prepare better for their quizzes so they could get to the "fun" and more engaging component of the class quicker.

Although overall grades were monitored throughout the entire study, more meaningful data could have been collected by monitoring the homework completion percentage on a weekly basis between the flipped classroom and traditional classroom. Perhaps monitoring and recording these data would provide more support and validity to the effectiveness or ineffectiveness of the flipped classroom. Measuring the amount of completed homework in both flipped and traditional classrooms could also disseminate data on the level of student engagement and preparedness.

It would also be thought-provoking to see how the study would have changed if I was able to only focus on the lecture portion of the flipped classroom grades, and not included both lecture and lab grades into the data being garnered. In these particular

Culinary Arts lab classes, students' grades are characteristically based off overall performance. Since the grade average is typically higher in the lab component, it moderately skews the outcome of the true measure of the effectiveness of the flipped classroom as an independent variable. Although part of the study was measuring performance in the lab based off how well the flipped classroom prepared the students compared to the traditional classroom, I believe merely looking at the scores only from non-lab days would create a larger gap in scores between the two teaching methodologies.

Recommendations for Future Research

There are several ways this study can serve as a springboard to future research. A future study may be conducted by taking the data obtained from measuring levels of student engagement and running statistical analysis on those data. In addition, finding additional ways to objectively measure in-class participation could provide more data to determine the effectiveness of the flipped classroom.

Separating hands-on lab activities and seated-classroom activities may provide more specific statistical evidence of success of the flipped classroom, since in this study, those activities were not differentiated. Further disaggregation, such as looking at grades on exams separately from assignment and activity grades, may also provide more evidence of the effectiveness of the flipped classroom when compared to the traditional classroom. Using different research methodologies, such as quantitative, qualitative and mixed methods research would produce multi-faceted data which could then be used to view the flipped classroom format holistically.

Summary

While general information on flipped classroom learning existed, research regarding the implementation into a Culinary Arts Technical Education classroom is lacking. The purpose of this study was to determine if the flipped classroom teaching modality would be beneficial to student engagement and academic success in technical programs. In Chapter One, the theoretical framework for this study was based on Howard Gardner's work of multiple intelligences. This study focused on four of Gardner's (2011) identified learning styles, which aligned most with the flipped classroom modality in a culinary arts technical education program.

The research questions, both qualitative and quantitative in nature, were presented and are vital components in action research (Herr & Anderson, 2015). The questions were designed to gather information regarding the differences in the level of engagement and academic success for students in both the traditional and flipped classrooms. Other questions were designed to collect data about the role of the teacher and how, if at all, his role changed. Determining what perceptions students had regarding how the flipped classroom either supported their learning or caused barriers was expressed in this study.

In Chapter Two, the review of literature was designed to expand the theoretical framework and provided details regarding multiple intelligences in regards to flipped classroom learning. The theoretical framework introduced two main theorists involved with multiple learning intelligences: Gardner (2011) and Kagan and Kagan (2014). Although nine intelligences were identified in their theories, the theoretical framework for this study focused only on four: bodily-kinesthetic, mathematical-logical, visual-spatial, and interpersonal. After the theoretical framework was presented, the background

of the foundations of the flipped classroom and explanations of the differences and similarities between flipped learning and the flipped classroom were discussed.

The history, statistics, and benefits of the flipped classroom were outlined to help create an appropriate foundation for the study. Finally, multiple types of technology used in the flipped classroom were outlined in the study, as well as different cost options for each. The review of literature also attempted to answer questions regarding roles of parents and teachers and how those roles change or remain the same as a traditional classroom. Challenges and misconceptions were also noted in the study to help avoid bias.

The research design methodology, instrumentation for data collection, and the analysis of the collected data for this study were outlined in Chapter Three. The researcher used action-based research, which included qualitative and quantitative components and allowed the researcher to play a dual role as the researcher and participant (Hendricks, 2013; Herr & Anderson, 2015; Sagor, 2011). Action research provided the researcher an opportunity to participate internally as the participating instructor and externally as the researcher, with the purpose of reflecting on his own teaching practices and levels of student engagement in his classes (Hendricks, 2013; Herr & Anderson, 2015; Sagor, 2011).

The qualitative component was important and allowed the researcher to have a certain amount of literary expression. The quantitative data were important to make sure there were enough collected data to validate the study. Action research is reflective in nature, so the study is often written in first person, which allows the researcher the

opportunity to reflect, act, evaluate his or her own instruction, and validate the effectiveness (Hendricks, 2013; Herr & Anderson, 2015).

In Chapter Four, the research design was presented along with identifying the population and sample, instruments used to collect data, the procedures which took place, and an explanation of the data analysis that was used. All five research questions were answered in conjunction with the data collection instruments created for each question.

The instruments created and used for this study were an engagement rubric, allowing the instructor to more accurately measure student engagement and report these measurements in the engagement matrix. The engagement journal allowed the instructor to answer the same questions regarding student engagement every four weeks of the study, whereas the reflective journal asked the same questions regarding daily activities at least three days each week. The engagement rubric and matrix, engagement journal, and reflective journal provided the answers to research questions one and two.

The student participants were asked to complete a post-course student perceptions survey, which provided the answers to research questions three and four. This survey asked specific questions, collecting numerical data on various aspects of student interaction with the flipped classroom, as well as giving the students the opportunity to rate effectiveness and provide personal perceptions in an open-ended format. The data for research question five were the end of semester grades. A quantitative, two-tailed t-test was conducted. A significant difference between end of semester grades in the flipped classroom and traditional classroom were not significant thus the null hypothesis could not be rejected.

Concluding the study was an outline of the researcher's findings, conclusions, implications, and recommendations for future research in Chapter Five. The findings of the research reflected higher levels of student engagement, attentiveness, and preparedness. In implications, the researcher described changes he would make if he were to redo the study or if the classroom structure could be modified. Recommendations for future research provided the opportunity to make suggestions for changes based off the gaps the researcher discovered in his research.

Appendix A

Pre-Course Technology Accessibility and Knowledge Survey

Your parent/guardian has agreed to allow you to participate in this survey. Your participation is voluntary and you may choose not to participate in this survey. You will not be penalized in any way, should you choose not to participate or withdraw.

1. Do you have regular access to a computer and/or laptop?
   - o Yes
   - o No
2. Do you have regular access to the internet?
   - o Yes
   - o No
3. Which of the following types of video viewing technologies do you have regular access?

   Check all that apply
   - o DVD player
   - o Smartphone
   - o Tablet
   - o Other:
4. Where do you have regular internet access?

   Check all that apply.
   - o In school
   - o Mobile devices
   - o Wherever I can find mobile hot spots
   - o At home
   - o At a friend's or relative's home
5. If videos were assigned to watch outside the classroom, where would you view the videos?

   Check all that apply.
   - o On the bus
   - o Riding in the car
   - o At home
   - o At a friend's or relative's house
   - o During class
   - o All of the above
6. Would you find digital video lessons helpful?
   - o Yes
   - o No
7. Are you familiar with the flipped classroom?
   - o Yes
   - o No

8. What experience have you had with the flipped classroom?

Appendix B

Engagement Journal

1. As a class, how much are the students engaged?
     Mark only one oval.
     o Exceeds expectations
     o Meets expectations
     o Below expectations
     o Needs direction

2. What have I been doing in class today?

3. What are my students working on?

4. General thoughts for the day.

Appendix C

Student Engagement Scoring Matrix

	Exceeds Expectations (4)	Meets Expectations (3)	Below Expectations (2)	Needs Direction (1)
In-class Participation	Energetically participating in in-class activities, completes all work, works ahead	Actively participating in in-class activities, completes work as assigned	Somewhat participating in in-class activities, does not complete all work	Not participating in in-class activities, does not complete any work
Student Engagement with Instructor	Is highly engaged with the instructor	Engages consistently with the instructor	Intermittently engages with the instructor	Does not engage with the instructor without additional support
Peer Engagement	Engages appropriately with other students, stays on task, and facilitates other students' learning	Engages appropriately with other students, discussions are class relevant topics	Somewhat engages other students, intermittently discussions are class relevant topics	Does not engage other students and has difficulty staying on topic with relevant discussions
Student Attentiveness	Student is copiously attentive, taking notes, asking questions, contributing to discussion or activity regularly	Student is attentive, taking notes, asks appropriate questions	Student is somewhat attentive, but is restless and sometimes loses focus of the topic	Student is not attentive, displays restless, day-dreaming and/or sleeping in class, does not focus on the content
Student Preparedness	Student comes to class completely prepared, always has supplies, even sharing with others. Asks clarifying questions prior to course content	Student consistently comes to class prepared, has supplies on a regular basis	Student occasionally comes to class prepared, sometimes has supplies	Student never comes to class prepared and does not bring supplies

Appendix D

Engagement Scoring Matrix Spreadsheet

Student #	In-Class Participation	Student Engagement with Instructor	Peer Engagement	Student Attentiveness	Student Preparedness	Total
Total						

Appendix E

A Reflective Journal of Daily Classroom Activities

1. What activities did we do?

2. What went well?

3. What did not go well?

4. Were there any surprises?

5. What would I change or do differently?

Appendix F

LINDENWOOD

DATE: July 16, 2015

TO: Michael T. Holik
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [755932-1] Comparing the Effectiveness of Flipped
                               Classroom and Traditional Classroom Student Engagement
                               and Teaching Methodologies
IRB REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: July 16, 2015
EXPIRATION DATE: July 16, 2016
REVIEW TYPE: Full Committee Review

Thank you for your submission of New Project materials for this research project.
Lindenwood University Institutional Review Board has APPROVED your submission.
This approval is based on an appropriate risk/benefit ratio and a study design wherein the
risks have been minimized. All research must be conducted in accordance with this
approved submission.

This submission has received Full Committee Review based on the applicable federal
regulation.

> Please change the contact information on the consent forms from (previous IRB
> rep) to (current IRB rep) (Interim Provost)

Please remember that informed consent is a process beginning with a description of the
study and insurance of participant understanding followed by a signed consent form.
Informed consent must continue throughout the study via a dialogue between the
researcher and research participant. Federal regulations require each participant receive a
copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this
office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please
use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting
requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of.

Please note that all research records must be retained for a minimum of three years.

If you have any questions, please contact (IRB rep name, number, and email). Please include your study title and reference number in all correspondence with this office.

If you have any questions, please send them to (IRB rep email). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Lindenwood Institutional Review Board's records.

Appendix G

Email to Chancellor of Participating College

June 2, 2015 at 2:19 p.m.

Hello (Chancellor's Name),

     I hope your summer is starting off well! I am going to be defending my proposal next week, and the IRB committee will be completing a full review on my research the following week. Since I am wanting to conduct the research in my class, I want to make sure I have received your permission to do so. If you would feel more comfortable seeing my proposal, I am happy to send it to you.

     This will be action-based research, and aside from a few surveys and an invitation to be interviewed, the students will not notice any interruption in their learning. The majority of work will be done on my part, as to interfere even less with the curriculum. In addition to my university's IRB, I will be submitting my work to the college's IRB committee. Aside from your permission and the both IRB committees' permission, is there anything else I need on this side for my study to take place here in the fall? I am trying to cover all bases, so I am prepared for both my proposal defense and the IRB Full Review.

Thank you for your time and consideration,

Michael T. Holik

Email from Chancellor of Participating College

June 3, 2015, at 2:26 p.m.

Sounds good. You have my permission.

Email from the Director of Research & Strategic Planning at Participating College

Friday, July 24, 2015, 12:32 p.m.

This is a notice that your IRB Application has been approved.
Please let me know of any questions,

Director of Research & Strategic Planning

Appendix H

LINDENWOOD

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Informed Consent for Administrator of Sending School to Sign for
Student Participation in Research Activities

Comparing the Effectiveness of Flipped Classroom and Traditional Classroom
Student Engagement and Teaching Methodologies

Principal Investigator: Michael T. Holik
       Telephone: Email:

Participant(s):

Administrator Contact info:

Dear Administrator,

1. Students in your district are invited to participate in a research study conducted by Michael T. Holik under the guidance of Dr. Rhonda Bishop. The purpose of this research is to determine if students participate more and achieve higher grades in a traditional or flipped classroom.

2. a) Student participation will involve the following:
      Students will be placed in either a traditional culinary arts class or a flipped classroom culinary arts class. In the traditional culinary arts class, students will follow the monthly calendar for (class name) and in the flipped classroom the monthly calendar for (class name). While both sections will require work outside the classroom, the activities will be different approaches to meeting course objectives.

      Students will be asked to complete two surveys; pre-and post-course, to provide their perceptions of the classroom environment with the instructor/researcher. Grades will also be used to determine if differences exist in academic success between the two teaching delivery methods. Students will be assigned a number to be used throughout the study to protect their identity.

      Approximately [32] students may be involved in this research.

b) The amount of time involved in student participation will be one semester beginning the 17th day of August, 2015, and ending the 11th day of December, 2015. Students will participate in their regular classes with no interruption. They will meet either Monday through Friday between the hours of 8am and 10:20am or from 12:20pm to 2:40pm.

3. There are no anticipated risks to students associated with this research.

4. There are no direct benefits for student participation in this study. However, student participation will contribute to the knowledge about student engagement and best practice teaching methodologies.

5. Student participation is voluntary and you may choose not to let your students participate in this research study or to withdraw your consent for participation at any time. Students may choose not to answer any questions they do not want to answer. You and the students will NOT be penalized in any way should you choose not to let your students participate or to withdraw your students.

6. We will do everything we can to protect student privacy. As part of this effort, student identities will not be revealed in any publication or presentation that may result from this study. Students will only be identified by a randomly picked number. No student ID or names will be used.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, or the Supervising Faculty. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Jann Weitzel, Vice President for Academic Affairs at 636-949-4846.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to the participation of my students in the research described above.

_____   _____
Participant's Signature   Date   Participant's Printed Name

_____   _____
Signature of Principal Investigator Date   Investigator Printed Name

Appendix I

LINDENWOOD

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Informed Consent for Parents to Sign for
Child Participation in Research Activities

Comparing the Effectiveness of Flipped Classroom and Traditional Classroom
Student Engagement and Teaching Methodologies

Principal Investigator:
    Telephone: Email:

Participant   _____

Parent Contact info _____

Dear Parent,

1. Your child is invited to participate in a research study conducted by Michael T. Holik under the guidance of Dr. Rhonda Bishop. The purpose of this research is to determine if students participate more and achieve higher grades in a traditional or flipped classroom.

2. a) Your child's participation will involve:
    Being placed in either a traditional culinary arts class or a flipped classroom culinary arts class. In the traditional culinary arts class, students will follow the monthly calendar for (class name) and in the flipped classroom the monthly calendar for (class name). While both sections will require work outside the classroom, the activities will be different approaches to meeting course objectives.

    Your child will be asked to complete two surveys; pre- and post- course. Questions will be asked so your child can provide his or her perceptions of the classroom environment with the instructor/researcher. Grades will also be used to determine if differences exist in academic success between the two teaching delivery methods. Your child will be assigned a number to be used throughout the study to protect his or her identity.

    Approximately [12-32] students may be involved in this research.

b) The amount of time involved in your child's participation will be one semester beginning, the 17th day of August, 2015, ending the 11th day of December, 2015. Your child will participate in his or her regular classes with no interruption, which meet either Monday through Friday between the hours of 8am and 10:20am or from 12:20pm to 2:40pm.

3. There are no anticipated risks to your child associated with this research.

4. There are no direct benefits for your child's participation in this study. However, your child's participation will contribute to the knowledge about student engagement and best practice teaching methodologies.

5. Your child's participation is voluntary and you may choose not to let your child participate in this research study or to withdraw your consent for your child's participation at any time. Your child may choose not to answer any questions that he or she does not want to answer. You and your child will NOT be penalized in any way should you choose not to let your child participate or to withdraw your child.

6. We will do everything we can to protect your child's privacy. As part of this effort, your child's identity will not be revealed in any publication or presentation that may result from this study. Your child will only be identified by a randomly picked number. No student ID or names will be used.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, or the Supervising Faculty. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Jann Weitzel, Vice President for Academic Affairs at 636-949-4846.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my child's participation in the research described above.

Parent's/Guardian's Signature	Date	Parent's/Guardian's Printed Name

Child's Printed Name

Signature of Investigator	Date	Investigator Printed Name

Appendix J

LINDENWOOD

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Adolescent Assent Form

June 21, 2015

I am conducting a study as part of my doctoral course requirements at Lindenwood University. At the end of the study, I will complete a paper, or dissertation, to report my findings.

Your parent/guardian has given permission for you to take part in the study; however, I would like you to decide if you want to participate. Please read about the study in the section below.

Study Title: Comparing the Effectiveness of Flipped Classroom and Traditional Classroom Student Engagement and Teaching Methodologies

Researcher's Name: Michael T. Holik

Supervising Faculty: Dr. Rhonda Bishop

What is the purpose of the study?
        The purpose of this study is to gather evidence from a technical education program to determine if students perform better in the flipped classroom or traditional classroom. Student perceptions about the learning in each type of classroom will also be explored. This information will be used to help determine the effectiveness of the flipped classroom. The data from this study may provide information to allow instructors to determine whether to proceed with the flipped classroom or return to the traditional teaching modality. While this study focuses specifically on one culinary arts technical education program and cannot be generalized to other technical education programs, the study could be considered for future, more structured studies with the ability to impact beyond one classroom.

What will I be asked to do?
        You will be placed in either a traditional culinary arts class or a flipped classroom culinary arts class. In the traditional culinary arts class, students will follow the monthly calendar for (class name) and in the flipped classroom the monthly calendar for (class

name). While both sections will require work outside the classroom, the activities will be different approaches to meeting course objectives.

You will be asked to complete two surveys; pre- and post- course to provide your perceptions of the classroom environment. Grades will also be used to determine if differences exist in academic success between the two teaching delivery methods. You will be assigned a number to be used throughout the study to protect your identity.

The amount of time involved in your participation will be minimal. Information for this study will be collected during one semester beginning, the 17th day of August, 2015, ending the 11th day of December, 2015. You will participate in regular classes with no interruption, which meet Monday through Friday between the hours of 8am and 10:20am or from 12:20pm to 2:40pm.

Approximately 20-32 students will be involved in this research, and the research will include 20-32 students from 6-17 school districts.

Are there any risks or benefits if I choose to participate?
There are no anticipated risks associated with this research. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about student engagement and best practice teaching methodologies.

Your participation is voluntary, and you may choose not to participate in this research study or to withdraw your consent at any time. You will NOT be penalized in any way should you choose not to participate or to withdraw.

We will do everything we can to protect your privacy. Your name or any personal information will not be revealed in any publication or presentation that may result from this study. The information collected will remain in the possession of the researcher in a locked cabinet for three years and will then be destroyed.

At any time, if you have any questions or concerns about this study, or if any problems arise, please let me know. You may also contact the supervising faculty Dr. Rhonda Bishop, ████████, ████████████████.

I have read this assent form and have been given the opportunity to ask questions. I would like to participate in the study (please sign/print your name below).

_____   _____
Student's Signature   Date   Student's Printed Name

_____   _____
Researcher's Signature   Date   Researcher's Printed Name

Appendix K

Post-Course Student Perceptions Survey

Your parent/guardian has agreed to allow you to participate in this survey. Your participation is voluntary and you may choose not to participate in this survey. You will not be penalized in any way, should you choose not to participate or withdraw.

1. Did you view the digital lessons prior to class as assigned?
Check all that apply.
   - o   All the time
   - o   Sometimes
   - o   A few times
   - o   None of the time

2. Did you view the digital lessons more than once?
Check all that apply.
   - o   All the time
   - o   Sometimes
   - o   A few times
   - o   None of the time

3. How many digital lessons did you view?
   - o   None
   - o   1-5
   - o   6-10
   - o   11-15
   - o   16-20
   - o   Over 20

4. If you answered *none* to question one, briefly explain why you did not view the digital lessons.

5. Where did you view the digital lessons?
Check all that apply.
   - o   On the bus
   - o   Riding in a car
   - o   At home
   - o   At a friend's or relative's house
   - o   During class
   - o   I did not view the digital lessons

6. Would you like to see more digital lessons incorporated into the culinary arts course?
   - o   Yes
   - o   No

7. Did you find the digital lessons helpful?
   - o   All the Time
   - o   Sometimes
   - o   A Few Times
   - o   None of the Time

8. Did anyone view the digital lessons with you?
- ○ Yes
- ○ No

9. If you answered *yes* to question eight, who viewed the digital lessons with you? Check all that apply.
- ○ Parent/Guardian
- ○ Siblings
- ○ Relatives
- ○ Friends
- ○ Other:

10. If you answered *yes* to question eight, did they find the digital lessons educational and worthwhile?
- ○ Yes
- ○ No

11. What element(s) of the digital lesson were most effective?

	Most Effective	Effective	Somewhat Effective	Least Effective
Helped me understand the material prior to attending class				
Being able to pause and rewind the digital lessons, helped me learn more effectively				
Allowed my parents to be more involved in my education				
The extra information provided throughout the lessons				
Watching the digital lessons outside of class ensured I completed all my assignments done during class				
Familiar face in the video made the lesson more real				
Other				

12. What, if any changes would you make to the digital video lessons?

13. What element(s) of the flipped classroom were most effective?

	Most Effective	Effective	Somewhat Effective	Least Effective
More interaction time with the instructor				
The freedom to work at my own pace				
Ensured I completed and turned in all of my assignments on time				
Gave me more opportunity to ask questions in class				
Kept me more engaged during class-time				
Allowed the instructor more time to demonstrate specific skills				
Other:				

14. Would you recommend the flipped classroom learning environment to friends?
  - o   Yes
  - o   No

15. If you answered *no* to Question 14, why not?

16. Do you feel you did better academically in the flipped classroom as compared to a traditional classroom?
  - o   Yes
  - o   No

17. Do you feel the flipped classroom engaged you more than a traditional classroom?
  - o   Yes
  - o   No

18. How much time on a weekly average, did you spend viewing the digital lessons?
  - o   None
  - o   Under one hour
  - o   1-5 hours
  - o   6-10 hours
  - o   11-15 hours
  - o   16-20 hours
  - o   Over 20 hours

19. How did the flipped classroom effect your outside of class work load?
  - o   Increased my work load
  - o   Decreased my work load
  - o   Remained the same

20. How often did you encounter barriers which kept you from being academically successful throughout the semester?

- o   All the time
- o   Sometimes
- o   A few times
- o   None of the time

21. What barriers did you encounter?

Check all that apply.

- o   Trouble accessing the digital lessons on a regular basis
- o   Class-time was not structured enough for me to learn
- o   Not enough time outside of class to view the digital lessons
- o   Not enough interaction with the instructor during class-time
- o   Other:

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Vita

Michael began his career at Ozarks Technical Community College (OTC) as an instructor in the Culinary Arts and Hospitality Management program. Michael holds an Associate of Hospitality Management degree, a Bachelor of Science degree in Hospitality Restaurant Administration, a Lifetime Missouri Teacher's Certification, and a Master of Science degree in Career and Technology Education Instruction.

Michael has been recognized for multiple achievements such as being inducted into the OTC Chancellor's Leadership Academy, a recipient of the OTC Faculty Excellence in Education Award in 2015, the Governor's Excellence in Teaching Award in 2016, and the Phi Theta Kappa Mentor Excellence in Leadership Award in 2010 and again in 2016. Michael has worked at OTC for 11.5 years and continues to set high standards and expectations for his students every semester. Michael works tirelessly to be as engaging and innovative as an instructor as he can be.

In Michael's spare time, his passion is traveling as often as possible. Michael has been to all states, except for six, including Hawaii and Alaska. He has cruised through most of the major Caribbean islands and various cities along the east and west coasts of Mexico. Michael has toured multiple cities in Canada and 14 countries in Europe. Michael enjoys home renovating, working in the garden, playing with his dogs, and spending time with friends and family. Michael's next step is to begin writing articles about action research and the flipped classroom, with hopes to publish.