Spring 1-2019

A Comparative Analysis of Student Success and Perceptions of Engagement Between Face-to-Face and Online College Courses

Shane Carroll May
Lindenwood University

Recommended Citation

A Comparative Analysis of Student Success and Perceptions

of Engagement Between Face-to-Face

and Online College Courses

by

Shane Carroll May

January 2019

A Dissertation submitted to the Education Faculty of Lindenwood University in

partial fulfillment of the requirements for the degree of

Doctor of Education

School of Education
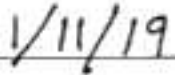
A Comparative Analysis of Student Success and Perceptions

of Engagement Between Face-to-Face

and Online College Courses

by

Shane Carroll May

This Dissertation has been approved as partial fulfillment

of the requirements for the degree of

Doctor of Education

Lindenwood University, School of Education
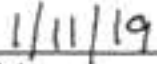
Kathy J Grover
Dr. Grover, Dissertation Chair

_1/11/19_
Date

Sherry DeVore
Dr. DeVore, Committee Member

_1/11/19_
Date

Megan Zacheis
Dr. Zacheis, Committee Member

_1/11/19_
Date

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.

Full Legal Name: Shane Carroll May

Signature: _____ Date: 1/11/2019

Abstract

The traditional face-to-face classroom is slowly losing its place in education as online learning becomes increasingly popular. With the growth of online learning, it falls to educators, administrators, and researchers to ensure students enrolled in online courses are being given an education equal to students enrolled in face-to-face courses. Beyond ensuring the students in online courses perform the same as their peers 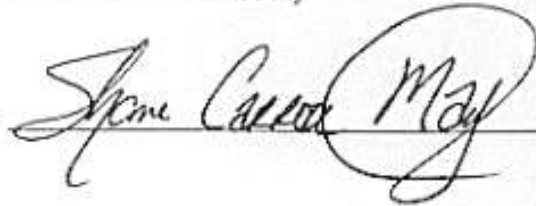in traditional courses, students across all delivery systems need to be engaged. In this study, the effectiveness and perceived engagement of students between online and face-to-face courses were examined comparing outcomes, attendance, and withdrawal rates; and perceptions of engagement from the view of students and faculty. From the results, there was no significant difference in outcomes between online and face-to-face courses. There was a difference in withdrawal and attendance rates between online and face-to-face courses, and students indicated adequate engagement in online courses, but still showed a preference for face-to-face courses when available. Faculty members felt better able to engage with students in face-to-face courses, and some tools (discussion boards and social media) did not aid in meaningful engagement. Online learning cannot be considered a trend, and students in online course perform at least as well as students in face-to-face courses. As students become increasingly more comfortable with online learning, it is incumbent upon educators to find a path to meaningful online student engagement.

Table of Contents

List of Tables

Chapter One: Introduction

The traditional-physical "brick and mortar" classroom is slowly being replaced with online learning (Nguyen, 2015) leaving educators and researchers more interested in how online learning impacts learning outcomes. Furthermore, online education is a means to reduce consumption of resources and to reach more students, which is of interest to school administrators (Allen & Seaman, 2016). The implementation of online learning has experienced tremendous growth and continues to gain momentum. (Cavanaugh & Jacquemin, 2015).

According to the 2015 Online Report Card, *Tracking Online Education in the United States*, from Allen and Seaman (2016), online education continues to experience year-to-year growth, and more than a quarter of all students (28%) now take at least one online course (p. 12). With this growth in online education, it makes sense to question whether students enrolled in online classes are as successful as their peers in face-to-face courses. However, it is also important to look beyond final outcomes and investigate other areas which impact outcomes and may change across delivery systems (Nguyen, 2015). One area of interest is student engagement because it meets both criteria mentioned above, has an impact on student outcomes (Lei, Cui, & Zhou, 2018), and may changes across delivery systems (Ghassemi, 2016). Overall, the question of equal student success alone is not enough: the question of student engagement must also be addressed (Lei et al., 2018, Nguyen, 2015).

A brief overview of current research and a description of the conceptual framework that guided this research is included in this chapter. After which, the purpose and goals of the research are delineated along with the specific questions to be addressed.

Lastly, the significance and role this research has in the current field of study are discussed.

Background of the Study

As more people have access to online learning, enrollment in online courses is growing and will continue to grow (Shuck, 2016). This growth in online education has played a more significant role in education, especially at the university level (Jo, Kim, & Yoon, 2015). Consequently, online learning has become an indispensable part of educational delivery (Ciabocchi, Ginsberg, & Picciano, 2016). It does not appear online learning is declining but will continue to increase as students indicate a preference for online courses when available (Jones & Blankenship, 2017).

The growth in online education has created a need to study the efficacy of online learning (Nguyen, 2015). While Nguyen (2015) found no significant difference in learner outcomes between online and face-to-face postsecondary courses, he stressed the need to look beyond grades to other aspects of learning which impact students. One area of concern which has a positive correlation to student outcomes is engagement (Lei et al., 2018).

According to Lei et al. (2018), engagement is the process of students being actively involved in their learning. Engagement includes the role the teacher plays in the classroom, and that role has an important part in higher education (Roorda, Jak, Zee, Oort, & Koomen, 2017). It is those activities associated with the teacher's presence that can have the most direct and positive influence on student outcomes (Rockinson-Szapkiw, Wendt, Wighting, & Nisbet, 2016).

Interaction between learners and teachers is changing due to online learning (Ng, 2018). It has been found that students interacting with each other and with the teacher was predictive of increased engagement (Nguyen, Cannata, & Miller, 2018). Because of the increase in online learning and the important role teachers and engagement play in the classroom (Roorda et al., 2017), Nguyen's (2015) recommendation of examining the role of online education beyond grades is important. In addition, research in student engagement in the context of online learning has produced complex questions which require further research (Czerkawski & Lyman, 2016). Objective engagement can be difficult to measure, and perceptions of engagement are just as important (Fulford & Zhang, 1993). Furthermore, engagement could be active or passive and change across delivery systems (Nguyen, Cannata, & Miller, 2018). Lei et al. (2018) stated, "The method of measuring student engagement used by researchers in their studies is equivalent to selecting a particular conceptualization of a construct; the term, student engagement, can mean many things to many people." (p. 519). For the purpose of this study, the definition of engagement was left to each participant since the perceptions of engagement were more important than objective measurements of engagement (Fulford & Zhang, 1993).

In this study, interviews, surveys, and data collection of grades, attendance, and withdrawal rates were used to determine the efficacy of online courses compared to same content face-to-face courses. The goal was to address a current gap in the existing research (Nguyen, 2015) by examining faculty and student perceptions of engagement and student outcomes across different delivery systems for an entire academic year. Next, a description of the conceptual framework which guided this study is given.

Conceptual Framework

The work of Moore (1989) and Mehrabian (1967) provided the conceptual framework that guided this research. Moore (1989) defined the concept of interaction as the center of any learning experience. Interaction was chosen as it is linked to the concept of engagement (Ayçiçek & Yanpar Yelken, 2018), and engagement is an important predictor of student success (Lei et al., 2018). In fact, the lack of interaction in a classroom is a barrier to learning specifically due to the impact of interaction on student engagement (Purarjomandlangrudi, Chen, & Nguyen, 2016).

Moore (1989) proposed three types of interactions: Learner-Content, Learner-Instructor, and Learner-Learner. These three interactions have been found to have an impact on student engagement (Bonafini, Chae, Park, & Jablokow, 2017; Nguyen, Cannata, & Miller, 2018). Nguyen et al. (2018) identified two forms of interaction, Learner-Learner and Learner-Instructor, were predictive of increased engagement. Bonafini et al. (2017) determined students who interacted with the content showed increased engagement. Moore (1989) interpreted distance education as a transaction and believed separation of the student and instructor led to misunderstandings and a gap in communication. The more a student and instructor interacted, the more the perceived distance between them was diminished (Moore, 1989), and technology was a means to close the gap (Kreie, Johnson, & Lebsock, 2017).

The second contribution to the conceptual framework came from Mehrabian's (1967) concept of immediacy. Mehrabian (1967) defined immediacy as those communicative behaviors that enhance closeness between people and reduce the distance between them. Immediacy was chosen as it was positively correlated to engagement

(Gilchrist-Petty, 2017). Teachers who showed highly immediate behaviors had an increase in student learning (Gilchrist-Petty, 2017). Immediacy was originally developed within the context of interpersonal communication but has been used in instructional communication research (LeFebvre, & Allen, 2014). Immediacy can have verbal and non-verbal forms (Mehrabian, 1971), and therefore, is not limited to the face-to-face course (Gardner, Anderson, & Wolvin, 2017). It is possible for teachers to show highly immediate behaviors in online courses and show the same increase in student engagement (Gardner et al., 2017).

Together, interaction and immediacy served as the conceptual underpinning for this research. Both concepts were essential to understanding student engagement in the classroom, whether online or face-to-face (Ayçiçek & Yanpar Yelken, 2018). With similar thoughts, LeFebvre and Allen (2014) said:

> Understanding the positive effects of immediacy for the college or university, administrators, professors, and teaching assistants ultimately benefits the students. Immediacy increases the likelihood of student affect for the subject, recall of material learned, enrollment in similar courses, institutional integration, and degree completion. In the short run, higher affective learning enhances the popularity of the subject matter and increases student enrollments. (p. 39)

Given the positive correlation engagement had on student outcomes (Lei et al., 2018) and the need to study the efficacy of online courses beyond course grades alone (Nguyen, 2015), the concepts of immediacy and interaction provided a good foundation on which to build this research. Next, a detailed statement of the problem is given along with the purpose of this study and the specific research questions.

Statement of the Problem

It seems students in online courses perform at least as well as their peers in traditional face-to-face courses (Nguyen, 2015). However, the analysis of studies of outcomes in online versus face-to-face courses was hampered by selection bias (Nguyen, 2015) and small sample sizes (Cavanaugh & Jacquemin, 2015). It was important to note similar student outcomes across different delivery systems should not be used to infer that students experience similar learning (Nicklen, Keating, Paynter, Storr, & Maloney, 2016). Nicklen et al. (2016) found students in online course had the same outcomes as students in traditional courses, which matched the analysis by Nguyen (2105), but Nicklen et al. (2016) found students in online courses faced dissatisfaction with online courses. Examining learner outcomes in online versus face-to-face courses, as measured by grades, is not sufficient; research should be focused on other areas which have an impact on student learning (Nguyen, 2015).

One area of impact is student engagement (Lei et al., 2018). Student engagement refers to active involvement of the students in their learning and has a positive correlation to student outcomes (Lei et al., 2018). Engagement was a natural choice because of the positive impact it can have on students (Young, Uy, & Bell, 2017). Young et al. (2017) found engagement can improve student outcomes and the quality of education a student receives. Furthermore, student engagement was appropriate for this research for two primary reasons. First, student engagement is a central topic in educational research today (Barkley, 2017), in part, because of the wide-ranging benefits identified by Young et al. (2017). Second, the concept of student engagement is not limited to face-to-face courses and applies to all delivery systems (Ghassemi, 2016; Lei et al., 2018).

Student engagement is not unique in having an impact on student outcomes; indeed, there are many disparate factors which have an influence on student outcomes (Vandamme, Meskens, & Superby, 2007). In addition, not all factors have the same level of impact on student outcomes (Simpson, 2006). However, one of the few factors that changes across delivery systems is the manner in which students are engaged (Nguyen, Cannata, & Miller, 2018).

In this study, the issues of small sample size (Cavanaugh & Jacquemin, 2015) were addressed by analyzing student outcomes over an entire academic year (Fall 2017, Spring 2018, and Summer 2018), and addressed selection bias (Nguyen, 2015) by using data from courses across all disciplines offering seated and online course sections at one Midwest community college. In addition to determining the quantitative difference between final course grades in the delivery systems, student and faculty perceptions of engagement were studied to address the recommendations of Nguyen (2015) and to consider other factors.

Purpose of the Study

The purpose of this mixed methods study was to investigate the differences in student outcomes, including any differences in attendance and withdrawal rates, and perceptions regarding the quality of instruction and engagement between online and face-to-face delivery systems at a Midwest community college. At the same time, instructors' perceptions of student engagement and the quality of their instruction, as well as students' perceptions of engagement with the instructor and course material were analyzed.

Research questions and hypotheses. The following research questions and hypotheses guided the study:

1. What is the difference between the final grades of students who are enrolled in identical online courses and the final grades of students who are enrolled in identical courses receiving face-to-face instruction?

$H1_0$: There is no difference between the final grades of students who are enrolled in identical online courses and the final grades of students who are enrolled in identical courses receiving face-to-face instruction.

2. What is the difference in withdrawal rates between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction?

$H2_0$: There is no difference in withdrawal rates between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction.

3. What is the difference in attendance between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction?

$H3_0$: There is no difference in attendance between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction.

4. Among students who are enrolled in online and face-to-face courses, what are their perceptions regarding the quality of instruction, immediacy, and the level of engagement with the course instructor and other students?

5. Among instructors who teach identical sections of a course using online and face-to-face delivery systems, what are their perceptions regarding the quality of instruction, immediacy, the level of engagement between themselves and students, and the level of engagement among the students in class?

Significance of the Study

The goal of this research was to address a current gap regarding student engagement in existing research of student outcomes in online versus face-to-face courses (Cavanaugh & Jacquemin, 2015; Nuygen 2015). To that end, the scope of this study was one complete academic year (Fall, Spring, and Summer) across multiple disciplines. Withdrawal rates and attendance across the different delivery systems were also addressed. Attendance was included because of the impact it has upon student outcomes (Kassarnig, Bjerre-Nielsen, Mones, Lehmann, & Lassen, 2017; Navarro Jover, & Martínez Ramírez, 2018) and withdrawal rates (Rocque, Jennings, Piquero, Ozkan, & Farrington, 2017; Suresh, Rao, & Hegde, 2017).

Beyond the questions of outcomes and retention, how students and faculty perceive engagement were studied. This result of the study increased the body of existing research (Lei, Cui, & Zhou, 2018) with data regarding specific forms of engagement: teacher-student, student-student, student-material, and student-computer. Specifically, perceptions of student engagement change across delivery systems were reported. The perceptions of engagement versus actual engagement were highlighted. While studying the objective quantitative measures of interaction versus students' perceptions of interaction, Fulford and Zhang (1993) found students' perceptions of engagement were better predictors of student satisfaction than were quantitative

measures. This was followed by Woods and Baker (2004) who concluded a student's perception of sufficient interaction with instructors and other students positively correlated with the level of satisfaction and the overall learning experience.

Definition of Key Terms

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

Asynchronous. Asynchronous refers to communication which does not happen in real-time, but is accessible at any time (Nicklen, Keating, Paynter, Storr, & Maloney, 2016).

Engagement. Engagement refers to students being actively involved in their learning tasks and activities (Lei et al., 2018).

Immediacy. Immediacy is the extent to which selected communicative behaviors enhance physical or psychological closeness in interpersonal communication (Mehrabian, 1967).

Interaction. Interaction is the process in which students examine, consider, and process the course information presented during the educational process (Moore, 1989). Interaction also refers to the communication between the instructor and the student as well as communication among students (Moore, 1989).

Learning management system. A learning management system is the computer system used to host online classrooms, educational resources, and deliver instruction (Harrison, Hutt, Thomas-Varcoe, Motteram, Else, Rawlings, & Gemmell, 2017).

Online course. For this research, both hybrid (or blended learning) and purely online learning were considered online learning. This is the same definition used by

Nuygen (2015) in his analysis of outcomes across different delivery systems and was used in this study to stay consistent with past research (Nuygen, 2015).

Student-content. As defined by Moore (1989), Learner-Content interaction is the interaction between the learner and the course information.

Student-student. As defined by Moore (1989), Learner-Learner interaction is communication between two or more students in a course. The interaction does not have to take place face-to-face and may occur online asynchronously (Moore, 1989).

Student-teacher. As defined by Moore (1989), Learner-Instructor interaction is communication between the instructor and the student in a course.

Synchronous. Synchronous refers to communication which happens in real-time, but is not accessible at any time (Nicklen, Keating, Paynter, Storr, & Maloney, 2016).

Limitations

A key limitation to this study was the process of determining whether a student is considered a successful learner. Students' final course grades were used to define a successful learner. While researchers in this area have used the same measurement (Chingos, Griffiths, Mulhern, & Spies, 2017; Stack, 2015), it should be noted that final course grades may not be a good indicator of being a successful learner (Krentler & Willis-Flurry, 2005). However, academics have not been able to successfully address the issue of appropriate student assessment (Wise & Smith, 2016), and that determination was beyond the scope of this study.

Regardless of the course grade, it should be noted that student learning outcomes were the same for similar courses across all delivery systems. A second limitation was the quality of data used for the quantitative portion of this research. The data were taken

directly from the Student Information Management System (SIS); the data were

dependent on the precision of data originally entered and on the precision of data

extracted by the college's Department of Institutional Research. Lastly, a limitation of

this study was employment of the researcher at the community college used for this

study. That employment represented a potential bias in the study.

The following assumption was accepted:

1. Participant responses were offered honestly and without bias.

Summary

The trend of increasing student enrollments in online courses shows no signs of

slowing and will continue to grow. (Shuck, 2016). Online courses play a significant role

in education, especially at the university level (Jo et al., 2015), and have become an

indispensable part of educational delivery (Ciabocchi, et al., 2016). Allen and Seaman

(2016) believed all stake-holders (students, faculty, and administrators) see online

education as beneficial. Because of the continued growth and multi-faceted popularity of

online courses (Allen & Seaman, 2016), there was a need to ensure student engagement

and success was, at least, the same as for students in online courses as in face-to-face

courses.

Student engagement was included with course outcomes because of the positive

correlation between student engagement and student outcomes (Lei et al., 2018). Having

a clear understanding of student engagement is important and places student engagement

as a central topic of conversation in education (Barkley, 2017). Through the research

questions posed in this current study, current gaps in existing research (Cavanaugh &

Jacquemin, 2015; Nuygen, 2015) were addressed to examine whether students perform as well in online courses as their peers in face-to-face courses.

The differences in attendance and withdrawal rates were also examined. Attendance is linked with withdrawal rates (Suresh, Rao, & Hegde, 2017) and is an important component of student success (Akhtar, Warburton, & Xu, 2017; Navarro Jover, & Martínez Ramírez, 2018). Lastly, how perceptions of engagement change across delivery systems from the viewpoint of students and faculty members was considered.

In Chapter One, the topic of the study was introduced, including a background of the issue and the conceptual framework used to guide this research. The purpose of the study and the significance were highlighted, and research questions, definitions of terms, and limitations were provided. In Chapter Two, a review of existing literature on engagement, online learning, immediacy, interaction, student outcomes, and attendance was provided. In Chapter Three, the methods and procedures applied in the study were explained. The analysis of the findings was detailed in Chapter Four with the conclusions, implications, and recommendations for future research addressed in Chapter Five.

Chapter Two: Review of Literature

The growth of online learning continues to advance with no signs of slowing (Jo, Kim, & Yoon, 2015; Shuck, 2016). As this growth continues, it is important to understand the impact online education has on students and how the students in online courses perform compared to peers in face-to-face courses. The differences include how students perform (Nguyen, 2015); student attendance (Louis, Bastian, McKimmie, & Lee, 2016), which impacts withdrawal rates (Rocque, Jennings, Piquero, Ozkan, & Farrington, 2017); how students are engaged (Lei et al., 2018); and perceptions of engagement (Fulford & Zhang, 1993).

Starting with the conceptual framework which guided this study, the following literature review delineates the current body of research concerning the substance and quality of online learning. Student engagement in face-to-face and online courses and the role interaction plays in student success are also examined. Lastly, the importance of attendance on student outcomes and a review of other factors which have an influence on student outcomes are given.

Conceptual Framework

The work of Moore's (1989) concept of interaction and Mehrabian's (1967) concept of immediacy were utilized as the framework for this research. Interaction, first elucidated by Moore (1989), is the center of any learning experience. Moore (1989) acknowledged that interaction carries many meanings and must have specific sub-meanings. From this, Moore (1989) proposed three types of interactions: Learner-Content, Learner-Instructor, and Learner-Learner:

- Learner-Content, also student-content, interaction is the interaction between the learner and the course information.

- Learner-Instructor, also student-teacher, interaction is communication between the instructor and the student in a course. This can be computer-mediated and is not restricted to face-to-face communication.

- Learner-Learner, also student-student, interaction is communication between two or more students in a course. The interaction does not have to take place face-to-face and may occur online asynchronously.

Moore (1989) defined interaction with emphasis on the "who" of interaction at the expense of "what," meaning the different types of interaction focus on who is interacting rather than clearly defining the interaction itself.

Moore (1989) believed distance between students and instructors led to communication gaps and misunderstandings. According to the concept of interaction, the more dialog which occurs between the instructor and student the less distance exists between the two (Moore, 1989). Advances in technology have made online interaction possible, which in effect decreases the distance between student and instructor (Kreie, Johnson, & Lebsock, 2017). The tools for communication found in course Learning Management Systems (LMS) can be used to increase the level of interaction and give students and instructors the opportunity to reduce the distance between them and obtain levels of interaction that match those found in traditional face-to-face courses (Rennar-Potacco et al., 2017).

Mehrabian (1967) defined immediacy as the magnitude to which certain communicative behaviors enforce and elevate physical and/or psychological closeness in

interpersonal communication and found these communication behaviors reduced

perceived distance between people. Immediacy can have verbal and non-verbal forms

(Mehrabian, 1971). Non-verbal immediacy represents the psychological closeness that

comes from facial expression, eye contact, posture, proximity, and touch (Mehrabian,

1971). Verbal immediacy represents the closeness that comes from word selection,

cadence, tone, asking questions, using humor, addressing individuals by name, initiating

discussion, and sharing personal examples (Mehrabian, 1971).

Anderson (1979) further described an immediate person was more likely to

engage in communication styles that were perceived as friendly and warm (smile, eye

contact, gestures, vocally expressive). Lastly, Mehrabian (1971) found non-verbal

behaviors increased sensory stimulation, which results in interactions that are more

affective and immediate. While immediacy was originally developed within the context

of interpersonal communication, immediacy has been used in instructional

communication research (LeFebvre & Allen, 2014).

The promotion of interaction helps to create instructor immediacy and community

in the classroom (LeFebvre & Allen, 2014). Kuo and Belland (2016) noted instruction

takes place in a social context, and teachers need to focus on social dynamics

(immediacy) by promoting student interaction. The promotion of student interactions is

an important part of the learning process (Kuo & Belland, 2016). Because of the

importance of prompting student interaction and immediacy in the classroom, LaRose

and Whitten (2000) used social cognitive theory to develop a unified framework based on

interaction and instructional immediacy. The goal was to create a model that included

both student and teacher immediacy along with computer immediacy (LaRose &

Whitten, 2000). From the proposed framework, LaRose and Whitten (2000) concluded

three possible sources of immediacy: Teacher immediacy, which encompasses

interactions between students and teachers; Student immediacy, which are the

interactions between students in a class; and computer immediacy, which are the

interactions between the students and the computer technology used in the course. These

sources of immediacy closely mirror the interactions of Moore (1989), and taken

together, these sources compose instructional immediacy (LaRose & Whitten, 2000).

Online Learning

Online education can no longer be considered a marginal part of educational

opportunities as it continues to gain acceptance (Gargano & Throop, 2017). Online

education provides administrators and educators an opportunity to reach more students

and open access to education for students who would not have enrolled otherwise

(Gargano & Throop, 2017). Taking advantage of the online educational landscape,

traditional educational institutions can remain relevant and address the pressure of

increasing enrollment, while reducing the cost of delivery (Gargano & Throop, 2017).

Institutions of higher education are moving to online learning to also address increasing

pressures from legislation and competition (Wang, 2017).

Despite the growth in online education (Shuck, 2016), online courses are not

without issue. Online courses have low course completion rates, which is a concern for

faculty and administrators (Murphy & Stewart, 2017). It has been found students in

online courses are more likely to need to repeat the course, to have lower completion

rates when repeating the course, and to experience early disengagement in the course than

are students in face-to-face courses (Murphy & Stewart, 2017). Furthermore, students in

online courses often feel isolated and lonely (Madland & Richards, 2016). Therefore, it is important teachers take steps to ensure students enrolled in online courses experience a sense of social cohesion (Madland & Richards, 2016), which is a part of behavioral engagement (Kahu, 2013).

Students enroll in online courses because of the convenience and flexibility these courses offer (Jayaratne & Moore, 2017). Jayaratne and Moore (2017) found students enrolled in online courses valued specific instructional activities: instructional videos, PowerPoints with recorded narrative, and video recording of live classes. Those instructional activities have been identified as having a positive impact on student engagement (Bonafini et al., 2017). Online courses which include the use of effective video enable students to develop a learning community and have the same opportunities to interact as peers in face-to-face classes (Rennar-Potacco, Orellana, & Salazar, 2017).

Developed correctly, online education gives an opportunity to increase student-student and student-teacher interactions (Rennar-Potacco et al., 2017). The different types of interactions students experience in an online class are not equal (Oh & Lee, 2016). Student-teacher interaction can reduce student anxiety and increase student persistence (Oh & Lee, 2016). According to Moore (1989), the role of student-teacher interaction is important as teachers need to increase online interactions to strengthen their social presence. Annamalai's (2018) findings support Moore's (1989) findings that teacher presence and interaction with a teacher in an online classroom are vital for student learning. The benefit is not limited to interaction with teachers, as students have more frequent interactions with one another when a learning community develops which encourages all students to stay committed to online learning (Oh & Lee, 2016).

Because of the important role student-student and student-teacher interactions play in developing an effective online learning environment (Oh & Lee, 2016; Rennar-Potacco et al., 2017), courses should be designed to utilize a wide-range of communication tools to foster interaction between students and help them feel connected (Green, Hoffmann, Donovan, & Phuntsog, 2017). Madland and Richards (2016) also investigated the role of student-student interactions in online courses and found student interaction is effective in eliminating the feelings of social isolation which can occur in online learning. The communication in online courses should be frequent and varied to help students feel connected to a learning environment, remain engaged and motivated, and be successful (Green et al., 2017).

As students transition from the traditional face-to-face classroom to an online classroom, the students need guidance from the teacher for meaningful online interaction to occur (Annamalai, 2018). The interaction between students in class may not be organic, so students must be taught to interact in effective ways by being given specific guidance, have adequate expectations set by the teacher, and have access to appropriate tools (Green et al., 2017). Annamalai (2018) stated, "The online interaction environment is new for the students to work collaboratively" (p. 14). Interactions between students in the class must be mediated by the teacher (Annamalai, 2018). Annamalai (2018) found online interactions between students which are not supervised by the teacher are not significant and do not lead to better learning outcomes.

Teaching an online course can be demanding, and teachers do not always know what interactions are effective for students (Phirangee, 2016). The approaches to student interaction used in traditional face-to-face courses cannot be directly applied to online

courses as these approaches are less effective in online courses (Phirangee, 2016).

Phirangee (2016) also found poor student-student interactions can have a negative impact

on student outcomes and negatively affect student learning.

The communication between students and faculty must be varied as students may

have disparate preferences regarding communication and engagement (Green et al.,

2017). Modes of communication found to positively impact student engagement and

interaction are social networks (Alahmar, 2017), instructional videos (Jayaratne &

Moore, 2017), text messages (Ng, 2018), discussion boards (Hoey, 2017), synchronous

text, and web meetings (Lowenthal et al., 2017). Educators must not ignore the role

technology plays in student engagement or fail to integrate technology into the classroom

as technology improves student outcomes and meets the expectations of students who

have acclimated to technology in everyday life (Sun & Chen, 2016).

Student outcomes in online courses are as good as those of face-to-face courses

(Nguyen, 2015). According to Hashim et al. (2017), outcomes are the same even though

student-student and student-teacher online interaction is not equal to face-to-face

communication, the inequality in interaction has no negative impact on learning

outcomes. Notvig, Petersen, and Balle (2018) compared face-to-face courses to online

courses to determine which delivery system provided the best outcomes for students.

Notvig et al. (2018) found the delivery system was less important than other dominant

factors: educator presence; meaningful interaction between students, interactions between

the students and the teacher, and interactions between the students and the content; and

engaging the student with online and offline activities. Given no statistical difference

exists between online and face-to-face courses (Nguyen, 2015), there are no findings to

provide evidence that online learning is superior to face-to-face learning (Abuatiq, Fike, Davis, Boren, & Menke, 2017).

Despite the similar outcomes of students across delivery systems, those similar outcomes do not imply similar learning (Nicklen, Keating, Paynter, Storr, & Maloney, 2016). Nicklen et al. (2016) found students in online courses have the same outcomes as students working in small face-to-face groups, but students in online courses faced dissatisfaction with the course and decreased perceived depth of learning. However, Den Harder, Frijlingh, Ravesloot, Oosterbaan, and van der Gijp (2016) examined the effective use of online courses and found students' perspectives of online learning are positive, and if developed effectively, students' knowledge and understanding improved when using an online delivery system.

Online learning is changing the way learners interact with instructors (Ng, 2018). Ng (2018) examined the use of text messaging in online courses. Ng (2018) found student-teacher interaction occurring, in part, by text messaging resulted in a decreased drop-out rate and an increase in student engagement. Lowenthal, Snelson, and Dunlap (2017) also examined alternate forms of communication in online courses, noting educators in most online courses still rely on asynchronous, text-based communication. Lowenthal et al. (2017) found using live synchronous web meetings during office hours provided some of the non-verbal immediate behaviors which aid in student engagement.

Synchronous online sessions are also important to student success (Carver, Mukherjee, & Lucio, 2017). Carver et al. (2017) analyzed course grades in online courses. Carver et al. (2017) reported, "A logistic regression revealed that of all the predictor variables, time spent in synchronous online sessions alone showed as a

significant predictor of receiving an A in the course" (p. 303). However, synchronous content in online courses may not be a requirement for student success (Kreie, Johnson, & Lebsock, 2017). After a semester comparing face-to-face, online, and online with synchronous content, student performance and evaluations were found to be similar across all delivery systems (Kreie et al., 2017). Moke and Wright (2017) also advocated the use of additional technologies outside of the Learning Management System to better engage and interact with students. Increasing instructor presence within an online course must be a priority, and technology can enhance student satisfaction and increase teacher engagement in online courses (Moke & Wright, 2017).

Grades alone are not sufficient to illustrate the efficacy of online courses, and researchers need to focus on other factors which impact student learning (Nuygen, 2015). Because of the impact student engagement and student motivation have on student outcomes, engagement is an area of research which should be explored (Bolkan, Goodboy, & Kelsey, 2016; Lei et al., 2018). Motivation is intertwined with student engagement (Barkley, 2017; Mazer & Stowe, 2016). Cole, Nicolini, Anderson, Bunton, Cherney, Fisher, and Allen (2017) sought to identify predictors of student motivation in online courses. Students' perceptions of teacher presence, not the actual level of teacher presence in online classes, is a strong predictor of student motivation in a course (Cole et al., 2017).

The role of interaction in online courses is another topic of concern (Hoey, 2017). Hoey (2017) examined discussion posts in online courses, finding the frequency of instructor interaction has no effect on learner outcomes. However, discussion posts that are instructional improve students' perceptions of learning, and conversational posts

improve students' perceptions of the instructor and course quality (Hoey 2017).

Moreover, Hoey (2017) found conversational posts had a positive impact on academic

achievement. The results indicate that design factors, such as student engagement, group

structures, and organization, influenced the nature and degree of deep learning (Hoey,

2017). Kuo and Belland (2016) also found an increase in student-student interaction

when discussion boards are used; however, the use of discussion boards does not imply

increased learning (Moon-Heum & Scott, 2016). Despite the positive impact

conversational posts can have on student outcomes, students are not enthusiastic about

the use of discussion boards and prefer the use of social media (Jayaratne & Moore,

2017).

Johnson, Hill, Lock, Altowairiki, Ostrowski, da Rosa dos Santos, and Liu (2017)

found that properly developed discussions in online courses result in deep learning, and

purposeful planning can engage learners in meaningful student-student interactions. The

design of discussions, including student engagement, proper groups and organization,

resulted in enhanced student learning (Johnson et al., 2017). Jones and Blankenship

(2017) agreed and recommended, "A robust and rigorous discussion board that not only

requires social interaction but also consistent feedback from the instructor as well as

peers should be included in the course design" (p. 5).

Student-teacher interaction is not the only interaction which has an impact on

student outcomes (Canals & Robbins, 2017; Prabhakar & Zaiane, 2017). Prabhakar and

Zaiane (2017) examined student-student interaction during discussion posts in online

courses. While students may be initially reluctant to interact with each other, a careful

grouping of students can lead to an increased level of interaction thereby maximizing

learning outcomes (Prabhakar & Zaiane, 2017). Student-student discussion board interactions are not the sole student-student interaction which impacts student outcomes (Canals & Robbins, 2017). The number of students enrolled, the number of student-teacher and student-student interactions, student engagement, and teachers' experience play a role in student outcomes in online courses (Canals & Robbins, 2017).

Engagement

Student engagement refers to the active involvement of students in their learning, which has a positive correlation to student outcomes (Lei et al., 2018). Therefore, having a clear, concise understanding of student engagement is important, making student engagement a central topic of conversation in education (Barkley, 2017). Czerkawski and Lyman (2017) explained "… because research on student engagement is yielding increasingly complex questions and issues, the need for research exploring engagement in the context of online learning is greater than ever" (p. 539). Engagement is important regardless of the course delivery system (Lei et al., 2018). Ghassemi (2016) illustrated the importance of engagement and overarching role of engagement across delivery systems, "Engaging students in learning increases their likelihood of success and insures retention of knowledge. Student engagement is important in all types of courses, whether online, hybrid, or face-to-face" (p. 21).

Engagement, specifically teacher engagement, plays a more important role in higher education because students tend to become naturally less engaged as they grow older (Roorda, Jak, Zee, Oort, & Koomen, 2017). Young, Uy, and Bell (2017) found student engagement can improve the quality of education and increase GPA, retention, completion, and continued education. White, Naidu, Yuriev, Short, McLaughlin, and

Larson (2017) hypothesized preparation and attendance increases student outcomes. White et al. (2017) found using a flipped classroom forced students to engage with the material, and engagement correlated positively with success. Furthermore, students who engaged with the material performed better and had a higher level of motivation than peers who did not engage with the material (White et al., 2017).

Engagement is positively correlated to immediacy, and teachers who show highly immediate behaviors have a great frequency of student participation in class (Gilchrist-Petty, 2017). Immediacy, as defined by student-teacher interactions, plays an important role in the educational domain (Gilchrist-Petty, 2017). Immediate behaviors are not limited to face-to-face settings (Gardner, Anderson, & Wolvin, 2017). Instructors are able to effectively show immediate behaviors by using students' names, as well as humor in written communication with the student (Gardner et al., 2017). Teachers who exhibit immediate behaviors create an atmosphere conducive to learning, engagement, and motivation (Mazer & Stowe, 2016). Mazer and Stowe's (2016) mention of motivation is important because Barkley (2017) also connected motivation with student engagement. Motivation is not only based on engagement (Estepp & Roberts, 2015). Teacher immediacy and teacher-student rapport are better predictors of motivation than engagement (Estepp & Roberts, 2015). According to LeFebvre and Allen (2014) immediacy also increased student engagement in several areas: affect for the subject, material recall, retention, and degree completion.

Perceptions of teacher immediacy are a predictor of student learning and outcomes (Gilchrist-Petty, 2017). More so, a combination of verbal and non-verbal immediacy behaviors act as a significant predictor of student learning (Gilchrist-Petty,

2017). Being a teacher who shows immediate behaviors is not a simple task (Akers, 2017). It is difficult to increase student engagement because students need to know teachers care for them (Akers, 2017). Furthermore, Akers (2017) stressed the importance the student-teacher relationship has on student engagement. Immediacy and student engagement are not only limited to face-to-face interactions (Gardner et al., 2017).

Engagement is also linked to interaction (Ayçiçek & Yanpar Yelken, 2018). Ayçiçek and Yanpar Yelken (2018) argued engagement was higher in flipped classrooms because students had more opportunities for one-to-one interaction with teachers and peers. These two types of interactions matched Moore's (1989) Learner-Learner and Learner-Instructor interaction. Engagement is also linked with Moore's (1989) Learner-Content interaction. Bonafini, Chae, Park and Jablokow (2017) determined student outcomes increased as students interacted with course videos, and that creation of interactive videos promoted students' engagement.

Witton (2017) advocated using lecture captures to create content, which would increase student interaction with the content and lead to an increase in student engagement and attainment. While specifically examining online courses, Purarjomandlangrudi, Chen, and Nguyen (2016) argued the lack of interaction between students, students and teachers, and students and content is a barrier to learning due to the impact of interaction on student engagement. Ghassemi (2016) noted student engagement and interaction are inexorably linked, and increasing one increases the other. Ghassemi's (2016) argument aligned with Kim and Lundberg's (2016) findings which provided insight into student-teacher interaction and the direct and indirect positive relationship interaction has on classroom engagement and cognitive skills.

Engagement is not a singular term (Lei et al., 2018). Czerkawski and Lyman (2016) developed a framework to increase engagement in online courses which emphasized interaction with the material and other students. Likewise, Nguyen, Cannata, and Miller (2018) found student-student interaction and student-teacher interaction are predictive of increased engagement and student learning. The same benefits of increased student engagement and learning were found by Young et al. (2017) and LeFebvre and Allen (2014).

Nguyen et al. (2018) broke engagement into active and passive engagement and observed how engagement changed across classrooms. Sinatra, Heddy, and Lombardi (2015) raised similar questions regarding a concrete definition of student engagement, noting research into engagement is important because of the benefits which occur when students are engaged. Despite the importance, Azevedo (2015) argued engagement is a nebulous and overused term that could take many meanings, such as:

> … student academic performance and achievement; classroom behaviors; approaches to interacting with instructional materials; students' self-perceptions of beliefs in handling individual and contextual aspects of learning situations; students' enactment of cognitive, motivational, affective, metacognitive, … teacher practices in learner-centered classrooms; and features of instructional and learning contexts designed to initiate, sustain, and foster learning. (p. 84)

Because of the importance of engagement, researchers should not be deterred by the definitional and conceptual challenges related to researching engagement (Azevedo, 2015).

The National Survey of Student Engagement (NSSE) is a survey instrument used to investigate student engagement in educational activities and has been used in many studies to link student engagement to student outcomes (Leach, 2016). Student engagement has many definitions which could be framed in different perspectives whether social, psychological, or cultural (Zepke & Leach, 2010). Student engagement can broadly be defined in two ways (Kahu, 2013; NSSE, 2018). The first definition defines engagement as the desired outcomes which reflect the student's feelings about his or her learning experience (Kahu, 2013). In other words, engagement is the psychological state of the student which impacts the student's learning and behavior (Kahu, 2013). The second definition focuses on the amount of time students invest in educational activities (NSSE, 2018). The research regarding student engagement is focused on the second definition examining engagement in terms of factors that influence student engagement; indicators of successful student engagement; and positive outcomes of student engagement (Kahu, 2013).

Engagement can be subdivided into three categories: cognitive (Zepke & Leach, 2010), behavioral (Kahu, 2013), and emotional (Witkowski & Cornell, 2015). Cognitive engagement is the student's motivation to learn (Zepke & Leach, 2010) and the student's resolve to complete academic challenges and meet expectations in class, as well as the processing of material learned in class (Kahu, 2013) using critical thinking (Witkowski & Cornell, 2015). Behavioral engagement measures the degree to which a student is actively involved in his or her learning (Kahu, 2013). A student who is behaviorally engaged invests more time participating in classroom activities and interacting with peers and teachers (Kahu, 2013). Emotional engagement measures the students' interests and

attitudes toward their learning experiences and whether they feel they are part of a learning community (Kahu, 2013; Witkowski & Cornell, 2015). Each type of engagement has separate features, all three of which overlap (Schindler, Burkholder, Morad, & Marsh, 2017). Regardless of the type of engagement: behavioral, emotional, or cognitive, there is a strong positive correlation between overall student engagement and student outcomes (Lei et al., 2018).

Immediacy has a significant impact on student engagement (Gerhardt, 2016). Gerhardt (2016) suggested perceived instructor immediacy impacts student behaviors which are necessary for engagement and students, especially millennials, and considers social immediacy as the most important role of the teacher. The role of teacher immediacy can even overcome teacher behaviors that discourage communication (Dixson, Greenwell, Rogers-Stacy, Weister, & Lauer, 2017). Dixson et al. (2017) studied the effects of teacher immediacy on student outcomes and the students' perceptions of teacher credibility and discovered teachers can use immediacy to mitigate negative communication skills, increase student motivation and affective learning, and leave students with a positive perception of the learning environment. The impact of teacher immediacy can also overcome instructor teaching philosophy and type of learning space (Sawers, Wicks, Mvududu, Seeley, & Copeland, 2016). Sawers et al. (2016) examined how the teaching philosophy and the type of learning space influence the teacher's perception of student engagement. A difference in perceived engagement across different learning spaces was found, but engagement was mediated by teacher immediacy (Sawers et al., 2016).

Because of the changing landscape in course delivery over the last few years (Jo, Kim, & Yoon, 2015), class communication alone is no longer sufficient (Goldman, Goodboy, & Bolkan, 2016). Goldman et al. (2016) revealed student communication with the teacher outside of the classroom is valuable to student learning, and it is possible to foster immediacy behaviors in a non-verbal manner (Gardner et al., 2017). The communication outside of the classroom extends beyond communication with the teacher to include communication with other students (Al-Dheleai & Tasir, 2017). Investigating communication between students outside of the classroom, Al-Dheleai and Tasir (2017) determined interactions between students are viewed as important to the students and a significant relationship exists between students' interaction and academic performance. Shuck (2016) stated clearly:

> One of the major insights from the participants' responses in the survey is that accessibility must be the driving factor when deciding on the future of education. Accessibility in this instance, refers to geographical accessibility–where distance is overcome to deliver education where it is needed. But also, to convenience of access to education–whereby students and professionals have the ability to learn anywhere and at any time (p. 4)

It is clear, with trending changes in classroom delivery, learning is moving beyond the traditional classroom (Shuck, 2016).

Interaction

Student-content and student-teacher interaction are predictors of student satisfaction in online courses (Kuo & Belland, 2016). Further, the belief students have in their own ability to use the internet effectively is positively correlated with all three types

of interaction (Kuo & Belland, 2016). The role of a student's computer self-efficacy is reinforced by the research of Nandi, Hamilton, Harland, and Mahmood (2015) who found it is important to ensure teachers and educational institutions provide administrative and technical support early in online courses to ensure students can effectively use technology and fully participate in their online courses.

While student-teacher interaction is influenced by gender and age, student-student interaction is influenced by course type and the number of discussion boards; student-content is not affected by student or course related variables (Kuo & Belland, 2016). Despite an increase in student-student interaction when discussion boards are used (Kuo & Belland, 2016), the use of discussion boards does not imply increased learning (Moon-Heum & Scott, 2016). Student-teacher interaction should be present in a variety of ways, such as email communication and timely feedback and should not be limited to discussion boards (Moon-Heum & Scott, 2016). If the teacher of an online course interacts with students, the students tend to perceive the teacher's presence online (Moon-Heum & Scott, 2016).

Students in online courses highly valued interventions by teachers to direct and extend discussions within discussion boards (Nandi et al., 2015). If the teacher manages online discussion boards effectively, he or she can improve student-student interaction and knowledge construction (Johnson, 2016). Johnson (2016) described discussion boards in online classes as a tool for students to explore ideas with their peers. This student-student interaction, rather than student-teacher interaction, provides students the benefit of peer's experiences (Johnson, 2016). However, because an online course has a discussion board does not imply quality interaction; how the course is designed and

managed has an impact on student interaction and outcomes (Johnson, 2016; Moon-Heum & Scott, 2016; Nandi et al., 2015).

Interaction between students and between student and teacher has a positive correlation with learning commitment and participation (Che Nidzam, Shaharim, & Mohd Faizal Nizam, 2017; Durksen, Way, Bobis, Anderson, Skilling, & Martin, 2017) and is vitally important in online classes (Raspopovic, Cvetanovic, Medan, & Ljubojevic, 2017). Interaction between everyone in the classroom is crucial, because the improved communication promotes active participation during lessons, increased student confidence, and motivation to learn (Che Nidzam et al., 2017). Douglas, Douglas, McClelland, and Davies (2015) also determined interaction is an important factor to students in the context of teaching, learning and assessment. Furthermore, student-teacher interaction also influenced student behavior and retention, which included remaining in their course of study, recommending the institution to others, and continuing their education beyond what was initially planned (Douglas et al., 2015).

Student-teacher interaction is important for student motivation and has a strong effect on student learning (Durksen et al., 2017). Mancini (2017) examined the role of interaction and the importance of the first day of class finding the first day of class was an indicator for successful outcomes. However, high-quality student-teacher interaction throughout the semester makes a lasting impression on students and has long-term positive effects on student outcomes (Mancini, 2017).

The positive impact of interaction between students and teachers is not limited to face-to-face interaction (Froment, Garcia, & M Rocío, 2017). Froment et al. (2017) considered the role of social media in student-teacher interaction and noted social media

has a positive impact on interaction, and by extension, a positive impact on benefits of increased interaction. Froment et al. (2017) stated:

> With respect to the impact of teacher-student interaction through social networks on the teaching-learning process, the improvement of teacher-student communication and relationship stands out. Likewise, teacher-student interaction through social networks generates a deeper knowledge of the other person on a personal level; helps break down barriers between teachers and students; and positively correlates to increased academic motivation, academic performance, student commitment and involvement, a positive classroom environment, student satisfaction with the teacher-student relationship, student empowerment, and student resilience. (p. 131)

The results of Froment et al. (2017) matched the findings of Al-Dheleai and Tasir (2017), which focused on the role of Facebook on student-teacher and student-student interaction outside of the classroom. Raspopovic et al. (2017) also examined the role of using social media in online education along with the impact it can have on interaction. Using social media elements in classrooms lead to higher student satisfaction, increased communication with teachers and peers, and a better understanding of course topics (Raspopovic et al., 2017).

The student's preference to using social media for online course communication is an important distinction, as students are not enthusiastic about the use of discussion boards within Learning Management Systems (Jayaratne & Moore, 2017). These findings supported Schindler et al. (2017) who found digital games and Facebook have a large impact on all types of student engagement. There are some significant adverse

side-effects of using social networks which included: sleep disorders, anxiety, depression, and addiction (Munkaila & Iddrisu, 2015). Given the serious nature of those side-effects of social media (Munkaila & Iddrisu, 2015) studies on the impact of social media on learner outcomes are limited (Alahmar, 2017). Alahmar (2017) found students are mindful of the impact social networks can have on academic performance, yet students also understand the value of the social interaction the networks provide. Despite the possible adverse impact of social networks (Munkaila & Iddrisu, 2015), the use of the networks has no appreciable impact on student grades, possibly because use of the networks is for the purposes of learning (Alahmar, 2017).

Attendance

Understanding the relationship between student attendance and student performance, even in an online course, is important (Louis, Bastian, McKimmie, & Lee, 2016). It has been found regular attendance is an important part of student success, as those students who are present the greatest number of days, have better outcomes in the course (Akhtar, Warburton, & Xu, 2017; Navarro Jover, & Martínez Ramírez, 2018). The impact attendance has on student outcomes was also examined by Kassarnig, Bjerre-Nielsen, Mones, Lehmann, and Lassen (2017) who found a correlation between attendance and final grades but noted attendance does not imply participation: "We have demonstrated the connection between attendance and performance; however, attendance alone does not imply active participation. Students who attend class may or may not participate actively in class activities…" (p. 12).

Attendance is not related only to outcomes, as greater attendance does improve outcomes, but the course attendance must be frequent and consistent in order to have an

impact on student outcomes (Pollak & Parnell, 2018). Courses which meet three times a week show better student performance versus student performance for courses which only meet two times per week (Pollak & Parnell, 2018). Hemers (2017) also determined a link between attendance and both retainment and retention. However, Hemers (2017) noted that increased attendance did not imply increased interaction with the course material. Furthermore, while students indicated they understood the importance of attendance and the impact it can have on their achievement, many still fail to attend (Hemers, 2017). Because of the importance of attendance, Hemers (2017) argued institutions of higher education should monitor attendance but also be proactive in tracking and monitoring attendance.

The impact attendance has on student outcomes is the same in both theoretical and applied courses (Dalkiran, 2018). Furthermore, Dalkiran (2018) found more than one-quarter (28%) of the variance related to student outcomes is related to attendance (p. 191). Attendance in an online course also has an impact on student outcomes (Park, 2017). Despite the time flexibility offered in an online course, a student's regular attendance is a factor that affects the success of an online learning experience (Park, 2017). In fact, students who attend the online courses on a regular basis can overcome a lack of student-student interactions (Park, 2017), which plays an important role in student success (Raspopovic et al., 2017). Louis, Bastian, McKimmie, and Lee (2016) determined regular class attendance is so critical to student success it can help mitigate the negative impact of a student's poor prior GPA on outcomes.

The importance of regular class attendance and the positive impact it has on outcomes was verified by Ayodele (2017). Ayodele (2017) also found attendance has no

gender bias and recommended instructors should focus on strategies which increase interaction with students to encourage increased attendance. Further adding to the body of research on the positive impacts of attendance on student outcomes, Levshankova, Hirons, Kirton, Knighting, and Jinks (2018) determined that students who regularly miss class do not perform as well as students who attend regularly, but also found non-attendance results in low levels of student motivation and argued for mandatory attendance.

The belief attendance *always* has a positive impact on student outcomes is not shared by all. Cutler, Parise, Seminario, Mendez, Piskorowski, and Silva (2016) did not find conclusively attendance in any delivery system improved student learning. Cutler et al. (2016) consider two arguments: (1) Attendance should be required, because it may have a positive impact on learning outcomes; and (2) Attendance is not as important as student engagement, and with advances in technology, engagement can be achieved without physical attendance. Regardless of the viewpoint, attendance does not guarantee learning, and the focus should be placed on student engagement and critical thinking (Cutler et al., 2016).

Attendance is not only correlated to student outcomes but also withdrawal rates (Rocque, Jennings, Piquero, Ozkan, & Farrington, 2017; Suresh, Rao, & Hegde, 2017). While examining students' attendance rates before they reach higher education Rocque et al. (2017) determined poor attendance is a precursor to dropping out of the educational process as well as having long-lasting negative life outcomes. Suresh et al. (2017) investigated a number of reasons why a student would withdraw from a course with attendance as a factor but also educational history, medical history, family background

and disciplinary issues. Wilson and Allen (2011) found no significant difference in withdrawal rates of students enrolled in online courses compared to students enrolled in face-to-face sources.

Attendance in an online course is just as important as attendance in face-to-face courses (Park, 2017). However, because of the nature of online courses, different tools are needed to increase attendance (Lowenthal, Dunlap, & Snelson, 2017). Lowenthal et al. (2017) discovered using live synchronous web meetings had a positive impact on attendance, and students who could not attend would watch the recording meeting at a later time. Moreover, the use of technology, including video and web meetings can have an impact on engagement and attendance (Moke & Wright, 2017). Students prefer lectures to be provided online; however, in the case of face-to-face courses attendance dropped when lecture was provided online (Asarta & Schmidt, 2015). Greefrath, Koepf, and Neugebauer (2017) did not find a drop in attendance but did find lecture recordings have a positive impact on student outcomes, noting:

> For first year students, attendance and recording use were positive predictors of performance. For weaker students, supplementary recording use was beneficial but only better students use of the recordings helped overcome the impact of low attendance. For second year students, attendance and recording use were positively correlated with, but no longer predictive of, achievement. There was no relationship for honours year students. We found no compelling evidence for a negative effect of recording use, or that attendance and recording use were related. (p. 1)

However, the issue of posting lectures online is not universally accepted with some faculty not wishing to encourage non-attendance at lectures (Greefrath, Koepf, & Neugebauer, 2017).

Other Factors Which Impact Student Outcomes

The factors which have an impact on student outcomes beyond attendance (Akhtar, Warburton, & Xu, 2017) and engagement (Lei et al., 2018) are disparate and numerous (Schneider & Preckel, 2017). Over 100 different factors have been identified to have an impact on student outcomes (Schneider & Preckel, 2017) and include: (1) student GPA (Kitsantas, Steen, & Huie, 2017; Harackiewicz, & Priniski, 2018); (2) physical activity (Donnelly, Hillman, Castelli, Etnier, Lee, Tomporowski, & Szabo-Reed, 2016; Erwin, Fedewa, & Ahn, 2017); (3) age (Amro, Mundy, & Kupczynski, 2015; Simpson, 2006; Vandamme et al., 2007); (4) gender (Harackiewicz & Priniski, 2018; Simpson, 2006); education of both parents (Ishitani, 2003); (5) parental involvement (Jeynes, 2017); (6) family size (Lee, 2018); (7) family income (Kahn, 2005; Vandamme et al., 2007); (8) substance abuse (Patrick, Schulenberg, & O'Malley, 2016); and (9) student and faculty attitude (Westerman, Whitaker, Bergman, Bergman, & Daly, 2016). Not all of these factors are equal in impact, and some of these factors have a much greater impact on a student's academic success (Simpson, 2006). However, understanding the factors which impact student outcomes is important for educators and administrators when trying to improve retention rates and working to mitigate the factors which negatively impact student outcomes (Goga, Kuyoro, & Goga, 2015).

Student GPA is a predictor of student outcomes (Harackiewicz & Priniski, 2018). Harackiewicz and Priniski (2018) investigated undergraduate students for one semester

and learned GPA and gender were significant in predicting student outcomes as measured by final course grades. Furthermore, GPA is associated with more interactions in the classroom (Harackiewicz & Priniski, 2018). Harackiewicz and Priniski (2018) stated, "…students who achieved highly before the course also (not surprisingly) achieved highly within the course, while interacting very much in the classroom" (p. 378). Kitsantas, Steen, and Huie (2017) also hypothesized student achievement would be predicted by prior student achievement. Schneider and Preckel (2017) determined past student achievement was predictive of future student success and stated, "High-achieving students in higher education are characterized by qualities that, in part, are affected by prior school education, for example, prior achievement, self-efficacy, intelligence, and the goal-directed use of learning strategies" (p. 81). Considering non-college young learners, it was found gender did not have an impact on student success, but GPA did (Kitsantas et al., 2017). Early academic success is essential for establishing a strong foundation for future academic development (Kitsantas et al., 2017), which agreed with the findings of Schneider and Preckel (2017).

Erwin, Fedewa, and Ahn, (2017) conducted a pilot study to investigate the impact physical activity might have on student outcomes. Erwin et al. (2017) determined small bouts of physical activity has a significant impact on student test scores. The study was limited due to small sample size and non-college young learners; however, the results were promising and Erwin et al. (2017) advocated 20 minutes of physical activity should be incorporated into class throughout the day. Donnelly et al. (2016) found small bouts of physical activity benefit cognitive functioning and support complex cognitive processes. The impact on student outcomes as a whole was found to be less clear, but

there was no indication physical activity was negatively correlated to academic achievement (Donnelly et al., 2016).

Age also seemed to be a predictor of student outcomes (Amro et al., 2015). While studying students in a college algebra course, Amro et al. (2015) noted both age and gender were predictors of student outcomes. Furthermore, female students out performed male students, and younger students performed better than older students (Amro et al., 2015). However, Edwards (2018) did not find a correlation between age and outcomes in online courses. This matches the findings of Amro et al. (2015), who determined age and gender are positively correlated with student outcomes in face-to-face courses, but age and gender are not correlated with student outcomes in online courses. Age has an impact on student achievement (Simpson, 2006). Simpson (2006) stated, "Age (middle aged students more likely to be successful than younger or older students)" (p. 131). Simpson (2006) also determined previous academic success was predictive of future success, which matched the findings of Kitsantas et al. (2017), and female students were more successful than male students, which were similar to the findings of Amro et al. (2015).

The impact of individual factors on student outcomes is not equal (Simpson, 2006. For example, the student outcomes between male and female students only differ by approximately 10% (p. 131). But, Simpson (2006) stressed that when all the factors are considered which impact student outcomes, the differences predicted can be significant. Vandamme et al. (2007) determined age to be a predictor of student outcomes, with older students performing worse than younger students. Vandamme et al.

(2007) did not find gender was a predictor of academic outcomes, rather a student's GPA had the highest positive correlation to student outcomes.

The education of both parents is also predictive of student outcomes (Ishitani, 2003). Comparing first-generation students with students who have college-educated parents, Ishitani (2003) found students with college-educated parents had better outcomes and lower rates of attrition than first-generation college students. However, the parent's educational attainment was not significantly related to student success (Vandamme et al., 2007).

Parental education was not the only parental factor which impacted student outcomes (Hodge & Mellin, 2010). Hodge and Mellin (2010) compared first-generation students with continuing-generation students and found students who have more involved parents experience better outcomes. The involvement Hodge and Mellin (2010) identified could be tangible financial support or motivational and emotional support. Academic achievement and student outcomes are influenced by parental involvement (Jeynes, 2017). The relationship between parental involvement and increased student outcomes exists for younger non-college students as well as older students in high school and the first years of college (Jeynes, 2017).

Lee (2018) investigated a link between parental involvement and student outcomes. The socio-economic status of the family and family size also have an impact on student outcomes (Lee, 2018). The link exists between socio-economic status and student outcomes, but gender and GPA are also identified as factors which influence student outcomes (Kahn, 2005). Kahn (2005) stated, "… the academic achievement of a student is only a function of his/her intellectual and personal characteristics" (p. 86).

Kahn (2005) argued the success of a student cannot be solely predicted by the student's

virtues. Goga, Kuyoro, and Goga (2015) concisely stated the importance of family in

student outcomes:

> All the respondents acknowledged that family background factors have large roles
>
> to play in the performance of first year students in tertiary institutions. It is
>
> emphasized that a harmonious home environment gives the students stability, and
>
> this is always evident in academic performance. It is concluded from the
>
> responses of the participants that a troubled mind will find it difficult to
>
> concentrate on academics, which may eventually lead to poor performance. (p.
>
> 1484)

The socio-economic status of the family as a predictive influencer of student outcomes

was also identified by Vandamme et al. (2007). However, Vandamme et al. (2007) did

not find a link between family size, parental marital status, or parental careers and student

outcomes.

Another factor which impacts student outcomes is drug use (Patrick, Schulenberg,

& O'Malley, 2016). Substance use, including cigarettes, during high school increased the

likelihood of the user never graduating from a two-year school (Patrick et al., 2016).

Students who participated in high school binge drinking also had higher college dropout

rates (Patrick et al., 2016). Drug use, specifically, marijuana has a negative impact on

student outcomes (Chu & Gershenson, 2018). College students who use marijuana spend

approximately 20% less time on course-related activities and 20% more time on personal

leisure activities (Chu & Gershenson, 2018, p. 14). The impact of drug use was not equal

among the student population, with the impact of drug use stronger on part-time college students and first-generation students (Chu & Gershenson, 2018).

Lastly, student and faculty attitudes also had an impact on student outcomes (Westerman, et al., 2016). Westerman et al. (2016) investigated college students enrolled in an Association to Advance Collegiate Schools of Business accredited school. Narcissistic faculty were associated with lower student outcomes, including the student's final grade, specifically, for students who were less narcissistic (Westerman et al., 2016). Peterson, Rubie-Davies, Osborne, and Sibley (2016) investigated if a teacher's implicit prejudiced attitudes had an impact on student outcomes. Students had better outcomes when their teachers' implicit biases favored the same ethnic group to which the student belonged, and teachers' prejudiced attitudes were a predictor of student outcomes (Peterson et al., 2016).

Goodman, Orange, and Schumacher (2017), while studying charter schools, found a teacher's positive attitude had a positive impact on student learning. Specifically, when students felt a positive attitude from the teacher, the positive attitude contributed to developing a stronger relationship, and teachers indicated more enjoyment in teaching (Goodman et al., 2017). Wubbels, Brekelmans, Mainhard, den Brok, and van Tartwijk (2016) found the impact of a teacher's attitude on student success was usually modest but noted the importance of teachers creating a learning environment which supported and enforced student-teacher interactions and immediacy. Wubbels et al. (2016) specifically called attention to the importance of teachers' attitudes and the impact those attitudes can had on at-risk students. Students identified as at-risk experienced a larger impact from

teachers' attitudes when compared to students who were not identified as at-risk (Wubbeles et al., 2016).

Summary

Online education is not a fad and is a growing part of education as online courses continue to gain acceptance (Gargano & Throop, 2017). Online courses allow students the freedom to pursue an education around other obligations such as work and family (Jayaratne & Moore, 2017). Educational institutions also benefit from online courses using online education to increase enrollment while also reducing cost (Gargano & Throop, 2017). Because of this growth in online education, it is important to understand the impact online courses have on students (Nguyen, 2015).

Two areas of interest when considering the efficacy of online courses are student engagement and interaction (Lei et al., 2018). Teachers who effectively engage students in class not only improve academic achievement but also increase retention, completion, and continued education (Young et al., 2017). Interaction between students, students and content (Kuo & Belland, 2016), and students and teachers have a positive correlation with learning commitment and participation (Che Nidzam et al., 2017; Durksen et al., 2017). Specifically, these interactions are crucial to the success of students in online courses (Raspopovic et al., 2017).

As previously discussed, the importance of attendance as a predictor of student outcomes cannot be overlooked (Dalkiran, 2018; Levshankova et al., 2018; Navarro Jover et al., 2018). Regular class attendance also has the benefit of increased student interactions (Kassarnig et al., 2017). Furthermore, regular attendance has an impact on

the withdrawal rates (Suresh et al., 2017) and a student's ability to be successful later in life (Rocque et al., 2017).

Lastly, engagement and attendance are not the only factors which impact student outcomes (Simpson, 2006; Vandamme et al, 2007). While there are many factors which influence student outcomes (Schneider & Preckel, 2017; Vandamme et al, 2007), not all factors have an equal impact on student outcomes (Simpson, 2006). Furthermore, of the factors which influence student outcomes delineated in the literature review, only the methods of student engagement change across delivery systems (Nguyen et al., 2018).

In Chapter Three, the methods, procedures, and planned analysis that were used for the study are explained in detail. Next, in Chapter Four, the statistical analysis of the secondary data is presented along with the quantitative analysis of students' responses and qualitative analysis of faculty interviews. Finally, in Chapter Five, the conclusions of the study, implications of the findings, and recommendations for future research have been addressed.

Chapter Three: Methodology

The purpose of this study was to examine the differences in student achievement and engagement between students enrolled in online courses versus peers enrolled in face-to-face courses. Ensuring students in online courses perform as well as peers in seated courses is rooted in the consistent and on-going growth in enrollment in online courses (Allen & Seaman, 2016; Cavanaugh & Jacquemin, 2015). Measuring student engagement is important as student engagement is positively correlated with student success (Lei et al., 2018).

In this chapter, the methodology used to address the research questions is given. This chapter includes the following elements: a statement of the problem and purpose, the design of the research to address the problem, a description of the population and sample, the validity and reliability of instruments, data collection methods, and data analysis processes. Lastly, ethical considerations are detailed, followed by the chapter summary.

Problem and Purpose Overview

The traditional classroom as the location of learning is being replaced with the location of the student being the site of learning (Nguyen, 2015). An alternative to the traditional classroom is the internet (Nguyen, 2015), which has made learning online possible, and in turn, all stakeholders (parents, students, faculty, and administrators) are interested in online learning to reach more students (Allen & Seaman, 2016), improve learner outcomes (Shuck, 2016), and reduce the cost of delivery (Allen & Seaman, 2016). Administrators are using information and communications technology (ICT) as a cost-saving tool that also provides a method to increase enrollment, indicating online learning

is a strategic long-term goal (Allen & Seaman, 2016. As online course offerings and

enrollments continue to grow (Allen & Seaman, 2016), there is an increased concern

about the performance of the students enrolled in online classes (Nguyen, 2015).

With online learning quality enhancements to a class can be provided, costs are

reduced, and enrollment increases (Allen & Seaman, 2016). Students enrolled in online

courses do not show a statistically significant difference in outcomes compared to

students in face-to-face courses despite the growth of educational technology (Nguyen,

2015). However, the analysis of studies of outcomes in online versus face-to-face

courses have been hampered by selection bias (Nguyen, 2015) and small sample sizes

(Cavanaugh & Jacquemin, 2015). In this study, those issues were addressed by analyzing

student outcomes over an entire academic year (Fall 2017, Spring 2018, and Summer

2018), and across all disciplines offering seated and online course sections.

In addition, student and faculty perceptions of engagement were studied. In this

study the following forms of engagement were examined: teacher-student, student-

student, and student-material. Specifically, changes in student engagement across

delivery systems were considered. The perceptions of engagement versus actual

engagement were highlighted as perceptions of interaction are an important factor in

student satisfaction (Fulford & Zhang, 1993). A positive correlation between the

student's level of satisfaction and learning and the student's perception of adequate

interaction with the teacher and peers (Woods & Baker, 2004).

The purpose of this mixed methods study was to investigate the differences in

student outcomes, including withdrawal rates, and perceptions regarding the quality of

instruction and engagement between online and face-to-face delivery systems at a

Midwest community college. At the same time, instructors' perceptions of student engagement and the quality of their instruction, as well as students' perceptions of engagement with the instructor and course material were analyzed.

Research questions and hypotheses.

The following five primary research questions guided data collection and analysis efforts:

1. What is the difference between the final grades of students who are enrolled in identical online courses and the final grades of students who are enrolled in identical courses receiving face-to-face instruction?

$H1_0$: There is no difference between the final grades of students who are enrolled in identical online courses and the final grades of students who are enrolled in identical courses receiving face-to-face instruction.

2. What is the difference in withdrawal rates between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction?

$H2_0$: There is no difference in withdrawal rates between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction.

3. What is the difference in attendance between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction?

$H3_0$: There is no difference in attendance between students who are enrolled in

identical online courses and students who are enrolled in identical courses

receiving face-to-face instruction.

4. Among students who are enrolled in online and face-to-face courses, what are

their perceptions regarding the quality of instruction, immediacy, and the level of

engagement with the course instructor and other students?

5. Among instructors who teach identical sections of a course using online and

face-to-face delivery systems, what are their perceptions regarding the quality of

instruction, immediacy, the level of engagement between themselves and

students, and the level of engagement among the students in class?

Research Design

The results of this longitudinal study add to existing research regarding student

outcomes and engagement between online and face-to-face delivery systems (Chingos,

Griffiths, Mulhern, & Spies, 2017; Stack, 2015) by expanding the sample size to include

more students over a longer period of time. The goal of this study was to address a gap in

previous research regarding perceptions and outcomes of the online learning experience

compared to the face-to-face learning experience by examining students' and instructors'

perceptions of the delivery systems across an extended period using a larger sample size

than used in previous studies (Cavanaugh & Jacquemin, 2015). Online and face-to-face

student grades, withdraw rates, and attendance were gathered from the Midwest

community college Student Information System (SIS), deidentified and delivered for

analysis. The primary investigator developed a survey instrument to collect data to

understand students' perceptions of engagement. Lastly, interviews with faculty

members were conducted to understand how faculty perceive engagement in their courses.

A mixed method study was selected to answer the research questions. According to Creswell and Plano Clark (2018), a mixed method design is a preferred design because "mixed methods research helps answer questions that cannot be answered by quantitative or qualitative approaches alone" (p. 20). Creswell and Plano Clark (2018) stated, "...the combination of quantitative and qualitative data provides a more complete understanding of the research problem than either approach by itself" (p. 33). In addition, there existed a need to enhance this study with a secondary data source because the primary data source did not provide a complete understanding of the research questions. Lastly, the need existed to gain a more complete understanding of the problem.

Similar research conducted in this area utilized a mixed method approach and quantitative data analysis coupled with surveys and interviews (Sutherland, Robertson, & John, 2004; Ward, Peters, & Shelley, 2010). Furthermore, Ary, Jacobs, Sorensen, and Walker (2019) explained that a mixed method approach provides a more complete explanation of the research findings than either method alone can provide. Qualitative data in the form of faculty interviews were used to explore the perceptions of instructors regarding online and face-to-face courses. The rationale for collecting the secondary data was to provide support to better explain the primary data.

Every research methodology faces inherent challenges that should be addressed (Ary et al., 2019). Mixed method research is complex, making a mixed method study more difficult to carry out, because the researcher must understand both quantitative and qualitative methodologies (Creswell & Plano Clark, 2018). A mixed method study also

typically involves more extensive data collection and analysis and thus may require more time and effort to complete, because the research involves different approaches to investigate a given problem (Ary et al., 2019). This complexity adds additional time needed to collect and dissect qualitative and quantitative data (Lodico, Spaulding, & Voegtle, 2006). The choice of using a mixed method approach to answer the research questions allowed the incorporation of secondary data collection, survey data, and face-to-face interviews. Using multiple perspectives afforded by a mixed method study created a narrative that enriched and explained the quantitative data (Ary et al., 2019; Creswell & Plano Clark, 2018).

Population and Sample

The study included three groups of participants at a public community college located in the Midwestern part of the United States. The population and sample were specifically limited in scope to identical sections of online and face-to-face courses for one academic school year: Fall 2017; Spring 2018; and Summer 2018. Using all identical sections for courses covering an entire academic year was meant to address the lack of longitudinal data in the current research (Cavanaugh & Jacquemin, 2015; Nuygen 2015).

The first sample group in this study, to provide student perceptions regarding the quality of engagement, was a random sample ($n = 1,000$) of students enrolled in online and face-to-face courses offered during the Fall 2018 semester. Random sampling is the most used and rigorous sampling technique (Creswell & Guetterman, 2019). Random sampling was purposeful, methodical, and ensured that the sample selected was not subject to biases of the researcher (Ary et al., 2019).

The second sample group included the entire population ($n = 1{,}663$), which included all students who had enrolled in identical sections of online and face-to-face courses. Extracted aggregate data for grades, withdrawals, and attendance for courses during the Fall 2017, Spring 2018, and Summer 2018 semesters were used. These data were used to compare learner outcomes from the two course delivery systems.

The third sample group ($n = 8$), was comprised from the population of instructors who had taught a minimum of 10 years with, at least five years of online teaching experience. All instructors interviewed were current faculty at the Midwest community college. The interviews were used to garner instructor perceptions regarding the quality of student engagement in online and face-to-face courses. Judgment sampling was used to select instructors who met the minimum teaching requirement. According to Ary et al, (2019), purposive or judgment sampling is a common sampling technique and allows for selection of the most productive sample to answer the research questions. In this case, instructors who had taught the most identical courses across the delivery methods were chosen to participate in the study.

Instrumentation

Because this study relied on three participant groups, three different data sources and collection methodologies were utilized. The quantitative data were collected from the institution's SIS and from student surveys, while qualitative data were gathered from faculty interviews. In the following section, the process of collecting and analyzing each type of data is described in detail.

Data Collection

For the quantitative study of student perceptions, a survey instrument (see Appendix A) designed by the primary investigator was employed. The survey included classification questions to identify each student's class status, number of classes taken using each delivery system, comfort level with ICT, and questions to measure student perceptions of engagement using a five-point Likert-type scale extending from 5 (very high or strongly agree) to 1 (very low or strongly disagree). The questions were adapted from current research as indicated by Burch, Heller, Burch, Freed, and Steed (2015), Wiggins, Eddy, Wener-Fligner, Freisem, Grunspan, Theobald, and Crowe (2017), and Yorke (2016).

To verify the clarity of the questions in the survey, a pilot study was conducted by administering the survey to 24 students who were not involved in the study. Surveys must be field tested to determine if desired data will result (Ary et al., 2019). The pilot was conducted via email with a hyperlink to the survey. Students were made aware that all responses were anonymous, and the results were used to improve the survey. After verification that the survey was correct, and upon receiving Institutional Review Board approval from Lindenwood University (see Appendix B), the survey was sent via email from the Information Technology Department based on a random sample of students generated by the Office of Institutional Research.

The surveys were administered following the three-step procedure recommended by Creswell and Gutterman (2019) to encourage a high return rate. An initial email was sent to the entire random sample of students and included a hyperlink to a Qualtrics survey, an independent survey service. Two weeks later, a reminder email was sent to

the sample of students. Lastly, two additional weeks later the last follow-up reminder was sent to the sample of students. According to Creswell and Gutterman (2019), "this three-step process should help you attain a good return rate" (p. 400). The surveys responses were used to answer research question four regarding students' perceptions of engagement in online and traditional face-to-face courses.

The quantitative study of learner outcomes and success was conducted using extracted aggregate data. The student data were de-identified and extracted by the institution's Office of Institutional Research. The data included the course identification and the number of students who withdrew, passed, and failed. The following steps outline the procedures for obtaining the data.

    a. A request was made to the appropriate college personnel in the Office of Institutional Research to extract and de-identify the data to ensure anonymity before sending to the researcher. The request included the research information sheet (see Appendix C), which described the study as approved by the Lindenwood University IRB.

    b. To ensure the data were collected correctly, the primary investigator submitted a research proposal to the participants' institution's Review Board, which was used to ensure all data collected were de-identified.

    c. These data gathered from online and face-to-face course enrollments for three semesters provided the input for analyses of research questions one and two.

To understand instructors' perceptions of the quality of student engagement, interviews were conducted (see Appendix D). Interviews provided an in-depth understanding of information regarding the instructors' views of student engagement and

ICT's role in education (Ary et al., 2019). The interview questions were derived from the same research as the student surveys (Burch et al., 2015; Wiggins et al., 2017; Yorke, 2016) and mirrored the questions in the student survey.

The questions were pilot tested with an instructor who met the judgment sampling criteria. The instructor's responses were not officially included in the study. The pilot test included a test of the recording and transcription tools, clarity of the questions, and the data analysis. Feedback was documented, and recommended changes were made to the interview questions prior to implementation.

The interviews were completed using a digital recorder to allow for transcription and further analysis of the responses given. All interviews were conducted personally and ranged from 25 to 50 minutes in length. Questions were provided to all participants prior to the interview to allow the interviewee time to reflect on the questions and subsequently give more substantive responses.

At times throughout the interview, additional follow-up questions were asked to clarify or expand upon given responses. The interviewees were asked to share classroom experiences but were not asked to share confidential information regarding current or past students. All names and other identifying information were removed from the interview responses, and participants were referred to using pseudonyms.

Data Analysis

Multiple research tools were used to answer the research questions: a student survey, extracted aggregate student data, and instructor interviews. The aim of using these tools was to investigate student learner outcomes across online and face-to-face delivery systems coupled with the perceptions of quality of instruction and student

engagement from student and instructor perspectives. The mixed method nature of this study was not limited by a single methodology, and the primary investigator was able to use all possible methods to explore the research questions (Ary et al., 2019; Creswell & Guetterman, 2019).

Creswell and Guetterman (2019) identified four steps in the analysis of quantitative data: (1) prepare and organize the data for the statistical analysis; (2) analyze the data to answer each research question; (3) present results in tables and figures and detailed discussion of findings; and (4) summarize the results in general statements. In this study, the quantitative data were collected from two sources: a student survey and extracted aggregate data from the institution. Data gathered from the student survey were used to answer question four and were analyzed using Excel. Likert-type scale questions were evaluated based on descriptive statistics to identify trends (Creswell & Guetterman, 2019) and crosstabulations were used to investigate differences in the responses (Ary et al., 2019).

Regarding the aggregate data collected from the Office of Institutional Research, Excel was used to conduct a quantitative analysis of the data. For question one (difference between outcomes between online and face-to-face courses), the percentage of successful and passing final grades per course were examined using an independent *t*-test to determine if a statistical difference existed between the online and face-to-face groups (Creswell & Guetterman, 2019). For this study, a grade of "A," "B," or "C" was considered successful and passing because the grade of "C" is the minimum grade that will transfer to another accredited institution (Northwest Arkansas Community College (NWACC), 2018). Grades of "F," "FP," and "D" were considered unsuccessful. Other

identifiers, such as "NP" and "W" were considered as withdrawn from the course, and all other identifiers, "I" and "AU", were ignored. Questions two and three (difference in withdrawal rates and attendance, respectively, between online and traditional courses) were examined using an independent *t*-test to determine if a statistical difference existed between the two groups (Creswell & Guetterman, 2019).

The interview data were qualitative, and according to Creswell and Gutterman (2019) there are six steps in analyzing qualitative data: (a) preparing the data for analysis, (b) exploring the data through coding, (c) using the codes to develop a picture of the data, (d) presenting the findings through narratives and visuals, (e) interpreting the results and, finally, (f) validating the accuracy of the findings. Creswell and Gutterman (2019) stated, "Initial preparation of the data for analysis requires organizing the vast amount of information, transferring it from spoken or written words to a typed file…" (p. 238). Interview responses were coded to determine emerging themes. Specifically, a coding scheme was used that included selection procedures based upon criteria of relevance (McMillan & Schumacher, 2006). This scheme provided concrete organization of results for analyzing qualitative data (McMillan & Schumacher, 2006).

Ethical Considerations

Because student surveys and faculty interviews were utilized, it was important to ensure that no participants in the research were harmed. According to Bryman and Bell (2015), the following is a list of the important ethical principles to consider: participants' identity should be kept private, participants should not be harmed, and respect for their dignity must be maintained; full informed consent must be obtained; the data collected must be confidential; any deception should be avoided, and all research communication

should be done with honesty and transparency. To that end, the following provides an overview of the steps the primary investigator took to ensure the concerns listed by Bryman and Bell (2015) were addressed.

The primary data were obtained from student surveys and faculty interviews. All students randomly selected to participate in the study were sent an introductory letter (see Appendix E) explaining the purpose, scope, voluntary nature, and privacy of the survey. All participants were required to give informed consent before they started the survey (see Appendix F). The students had the right to withdraw or stop the survey at any stage if they wished to do so. Furthermore, the survey did not contain questions requesting identifying information from the participant.

Each person selected for an interview was sent an introductory letter explaining the scope and purpose of the interview (see Appendix G). The faculty interviews were voluntary with an explanation of the process, and written informed consent was given before the start of the interview (see Appendix H). Each interview was recorded, and the audio files were stored in a password protected format. The privacy and anonymity of the interviewees were ensured by not referring to participants by name. Those who participated in the interviews had the right to stop the interview at any point and request the recording be deleted.

The secondary data, grades, attendance, and withdrawal rates were collected only in the aggregate and had been de-identified. The data were limited to the course, term, letter grade, attendance percentage, and withdrawal percentage. All data were sent and was stored in a password protected format.

Summary

In this chapter, an overview of the research methodology used for this study was given. A mixed methods research design aligned with the goals of the study, which was to examine learner outcomes in online and face-to-face courses along with instructor and student perceived quality and level of engagement across the delivery systems. Consistent with the framework of the research design, three types of data collection methods were employed including; surveys, interviews, and aggregate data extracted from the college information system. During data analysis, the quantitative and qualitative phases of the study were examined. In the quantitative phase, issues of student perceptions of engagement and student outcomes across the delivery systems were addressed. In the qualitative phase, instructors' perceptions of the quality of instruction and engagement in online and face-to-face courses they taught were analyzed.

In this chapter, the structures utilized to address the central theme of this study were detailed. The goal is to contribute to the field of online learning. In the following chapters a detailed discussion of the results is given along with closing remarks and directions for future research.

Chapter Four: Analysis of Data

In this chapter, an analysis of the data is conducted. The results are presented for each research question, and the findings are presented in summarized narratives and tables. The purpose of the study was:

1. To investigate the difference between student outcomes and withdrawal rates in traditional seated courses versus online courses.

2. To investigate the difference in student's perceptions of engagement and interaction in traditional seated courses versus online courses.

3. To investigate perceptions of student engagement and interaction between traditional seated courses versus online courses from a faculty perspective.

To accomplish this research, data were extracted from a Midwest community college enterprise resources planning system (ERP) and descriptive statistics along with statistical tests were performed for each variable using Excel. Student survey results were collected from Qualtrics and extracted to Excel for analysis and presentation. Lastly, faculty interviews were conducted in person, recorded, transcribed, and coded for analysis.

Research Question One

What is the difference between the final grades of students who are enrolled in identical online courses and the final grades of students who are enrolled in identical courses receiving face-to-face instruction? The data consisted of a sample ($n = 1,663$) of sections of courses during the 2017-18 academic year. The only courses selected had both seated and online sections. Of the 1,663 sections, 975 were classified as seated with 688 online.

For each section, the grades A, B, C, D, and F were coded to their respective

grade point: A = 4, B = 3, C = 2, D = 1, and F = 0. Three grades were handled

differently. A grade of FP was coded as a 0 for failing. The FP grade is given to those

students who failed the course because of a failure to participate in at least half of the

course assessments (Syllabus Policies, 2018). Thirty-six grades of I for incompletes and

AU for audit were removed from the results. Table 1 shows a distribution of grades by

delivery system, and Table 2 contains the basic descriptive statistics.

Table 1

Distribution of Grades by Delivery System

Grade	Seated / Traditional Sections	Online Sections
A	38.54%	41.52%
B	25.63%	23.55%
C	16.34%	14.82%
D	6.10%	5.41%
F	13.38%	14.70%

Table 2

Descriptive Statistics for Final Grades

Statistic	Seated / Traditional Sections	Online Sections
Mean	2.698	2.717
Standard Error	0.010	0.0132
Median	3.000	3.000
Mode	4.000	4.000
Standard Deviation	1.380	1.422
Sample Variance	1.906	2.023
Kurtosis	-0.592	-0.641
Skewness	-0.808	-0.833
Range	4.000	4.000
Minimum	0.000	0.000
Maximum	4.000	4.000
Sum	46,394.000	31,530.000
Count	17,193.000	11,602.000

An independent *t*-test was conducted to determine if there was a difference in final grades of the course delivery. Equal variances were not assumed with an alpha of .05. Using a two-tailed .05 criterion, the null hypothesis was not rejected. As shown in Table 3, if *t* Stat < -*t* Critical two-tail or *t* Stat > *t* Critical two-tail, the null hypothesis should be rejected (Ary et al., 2019). This was not the case, -1.960 < -1.137 < 1.960. Therefore, the null hypothesis was not rejected. The observed difference between the sample means (2.699 - 2.818) was not convincing enough to claim the average final grade between online and seated courses differed significantly. This result matched previous research (Nguyen, 2015).

Table 3

Independent t-test for Equality of Means for Final Grades

Statistic	Seated / Traditional Sections	Online Sections
Mean	2.698	2.717
Variance	1.906	2.023
Observations	17,193.000	11,602.000
t Stat	-1.1373	
t Critical two-tail	1.960	

Research Question Two

What is the difference in withdrawal rates between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction? The data were from the same sample used for question one. The withdrawal percentage was calculated for each section by taking the number of students who withdrew from the course divided by the total number of students enrolled in the course. Table 4 shows the basic descriptive statistics of withdrawal rates for seated and online courses.

Table 4

Descriptive Statistics for Withdrawal Rates

Statistic	Seated / Traditional Sections	Online Sections
Mean	0.083	0.103
Standard Error	0.002	0.003
Median	0.067	0.0833
Mode	0.000	0.000
Standard Deviation	0.086	0.101
Sample Variance	0.0075	0.0103
Kurtosis	2.075	1.349
Skewness	1.333	1.217
Range	0.500	0.500
Minimum	0.000	0.000
Maximum	0.500	0.500
Sum	81.808	70.879
Count	975.000	688.000

To determine if a significant difference in withdrawal rates existed between the delivery systems, a two-tail *t*-test was conducted. If *t* Stat < -*t* Critical two-tail or *t* Stat > *t* Critical two-tail, the null hypothesis should be rejected (Ary et al., 2019). As show in Table 5, -1.962 < -4.003 < 1.962 was not true. Therefore, the null hypothesis was rejected. The observed difference between the sample means (0.084 - 0.103) was remarkable enough to conclude withdrawal rates between seated and online courses differed significantly.

Table 5

Independent t-test for Equality of Means for Withdrawal Rates

Statistic	Seated / Traditional Sections	Online Sections
Mean	0.083	0.103
Variance	0.007	0.010
Observations	975.000	688.000
t Stat	-4.003	
t Critical two-tail	1.961	

Research Question Three

What is the difference in attendance between students who are enrolled in

identical online courses and students who are enrolled in identical courses receiving

face-to-face instruction? The data for question three was from all classes used for

analysis in questions one and two for which attendance was recorded. The sample was

smaller (*n* = 1471) with 921 seated sections and 550 online sections. For each of the

sections, the total number of absences for the semester was given. Table 6 shows

descriptive statistics for both delivery systems.

Table 6

Descriptive Statistics for Attendance

Statistic	Seated / Traditional Sections	Online Sections
Mean	89.306	27.894
Standard Error	2.001	1.1951
Median	81.000	20.500
Mode	59.000	0.000
Standard Deviation	60.734	28.029
Sample Variance	3,688.693	785.6391
Kurtosis	0.589	6.423
Skewness	0.862	2.021
Range	352.000	207.000
Minimum	0.000	0.000
Maximum	352.000	207.000
Sum	82,251.000	15,342.000
Count	921.000	550.000

A two-tail *t*-test was conducted to determine if a significant difference in

attendance existed. If *t* Stat < -*t* Critical two-tail or *t* Stat > *t* Critical two-tail, the null

hypothesis should be rejected (Ary et al., 2019). It is clear from the analysis -1.962 <

26.346 < 1.962. was not true. Therefore, the null hypothesis was rejected. The observed

difference between the sample means (89.396 - 27.895) was convincing enough to claim attendance rates between online and seated courses differed significantly.

Table 7

Independent t-test for Equality of Means for Attendance

Statistic	Seated / Traditional Sections	Online Sections
Mean	89.306	27.894
Variance	3688.693	785.639
Observations	921.000	550.000
t Stat	26.345	
t Critical two-tail	1.9616	

While the difference was significant, care must be given when drawing conclusions based on the data. The data for attendance was incomplete and according to Creswell and Gutterman (2019), "… [one must] eliminate participants with missing scores from the data analysis and include only those participants for whom complete data exist. This practice, in effect, may severely reduce the number of overall participants for data analysis" (p. 180). Because the analysis was based on incomplete information, it is therefore, subject to possible error (Ary et al., 2019).

Not all faculty members recorded attendance since keeping attendance data was not required at the time of the study. Because of the lack of required attendance tracking, some courses had no attendance data, or the data were incomplete for the entirety of the term. This explains why the attendance data had fewer sections ($n = 1471$) versus the sections used for the grade analysis ($n = 1663$). Lastly, the methodology used to determine an absence in an online class versus a seated class was different. The determination of an absence in a seated course was an objective choice: Present, Absent, Excused, or Tardy (Success Planner Attendance Tracking Faculty Guide, 2016).

Attendance of Tardy was considered Present, and attendance of Excused was considered Absent. For online courses, the determination of attendance was subjective and left to the faculty member to decide what conditions constituted attendance (Syllabus Policies, 2018). No institution-wide policy existed to guide the determination of attendance in an online course. A policy was adopted in March 2018 and placed into effect in Fall 2018.

Despite the limitations of the data, the results were worth analysis and investigation as the appropriate sample size was 1,301 with a given delta of 0.10. The delta of 0.10 was chosen based on guidance from Ary et al. (2019). The effect size was used to determine the appropriate sample size to reach a desired probability of rejecting the null hypothesis (Ary et al., 2019). In this case, the calculated necessary sample size of 1301 was smaller than the study sample size ($n = 1,471$); therefore, the study sample was worth analysis.

Research Question Four

Among students who are enrolled in online and face-to-face courses, what are their perceptions regarding the quality of instruction, immediacy, and the level of engagement with the course instructor and other students? To answer this question, a survey was sent to 1,000 random students. The response rate was 11% with 110 respondents. Of the 110 respondents, only 86 completed the full survey. Of those completed responses, 42 respondents classified themselves as male, with 43 female and one non-specified. The respondents had taken an average of 4.3 online courses and 10.6 traditional seated courses. Table 8 shows a crosstabulation of the preferred delivery method with a clear preference for traditional seated courses.

Table 8

Crosstabulation of Preferred Delivery Method

Seated	Online	Non-Preference
50	21	15

Table 9 shows the crosstabulation for students' perceptions of engagement and interaction for all courses the students had taken. A plurality of students disagreed with the statement that instruction is better in online courses, with 45.33% of respondents disagreeing or strongly disagreeing with the statement. A majority of students also indicated they were not able to engage effectively with an instructor in an online class, with 54.65% selecting disagree or strongly disagree. A similar percentage of students felt they were not able to engage in a meaningful way with their peers in an online class, with 53.33% disagreeing or strongly disagreeing with the statement.

The view of engagement with the course material was less clear. Only 33.72% of respondents felt the engagement with the material was better in online courses compared to a face-to-face course, and 37.21% felt engagement was worse in an online course. Lastly, 41.68% of respondents preferred to take a seated course if it was offered or available to them.

Table 9

Student Perceptions for All Courses

Statements	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	NA
Instruction in online courses is better	4.65%	15.12%	23.26%	32.56%	12.79%	11.63%
Instructor engagement is better in online courses	6.98%	8.14%	18.60%	34.88%	19.77%	11.63%
Engagement with other students is better in online courses	8.14%	16.28%	11.63%	29.07%	23.26%	11.63%
Engagement with the material is better in online courses	15.12%	18.60%	17.44%	24.42%	12.79%	11.63%
I would have taken a seated course if it was offered	19.77%	22.09%	19.77%	10.47%	16.28%	11.63%

In statements 12 through 22 students' experiences in online courses they have taken were measured. A summary of the data is shown in Table 10. A majority of respondents indicated they were effectively able to use the computer (84.88%) and the Learning Management System (83.72%). These results align with the majority of students (79.07%) indicated they had adequate technology skills to be successful in an online class. Most of the students (69.77%) felt the instructor had adequate technology skills to teach online. It is worth noting the majority of students (76.74%) indicated they had adequate interaction with course material, but 37.21% felt interaction with the material was better in a seated course.

Table 10

Student Perceptions for Online Courses

Statement	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	NA
Adequate interaction with other students	12.79%	25.58%	15.12%	25.58%	8.14%	12.79%
Part of a learning community	13.95%	45.35%	12.79%	12.79%	4.65%	10.47%
Effectively use the computer	47.67%	37.21%	2.33%	1.16%	1.16%	10.47%
Effectively use the LMS	41.86%	41.86%	2.33%	2.33%	1.16%	10.47%
Adequate interaction with course content	32.56%	44.19%	8.14%	3.49%	1.16%	10.47%
Instructor was effective using technology	30.23%	39.53%	12.79%	5.81%	1.16%	10.47%
Instructor was effective using social media	5.81%	9.30%	27.91%	8.14%	3.49%	45.35%
Instructor was effective using discussion boards	16.28%	44.19%	12.79%	8.14%	3.49%	15.12%
I have adequate technology skills for online courses	40.70%	38.37%	4.65%	2.33%	1.16%	12.79%
The technology worked with minimal problems	30.23%	43.02%	3.49%	8.14%	1.16%	13.95%
Adequate technology support	25.58%	34.88%	15.12%	4.65%	1.16%	18.60%

In the last set of statements, students were asked to give their perceptions of engagement and interaction in the traditional seated courses they had taken (see Table 11). Respondents strongly agreed with the statements regarding traditional seated courses. When compared to online courses, students indicated a better experience interacting with other students, 84.88% for seated courses versus 38.37% for online courses. While students indicated they had adequate interaction with content in online courses (76.74%), they felt more strongly they had adequate interaction in seated courses (91.86%). Students also felt strongly that they were part of a learning community in seated courses (89.53%), with only 59.30% agreeing with the statement in online courses.

Table 11

Student Perceptions for Traditional Seated Courses

Statement	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	NA
Adequate interaction with other students	27.91%	56.98%	4.65%	8.14%	1.16%	1.16%
Part of a learning community	40.70%	48.84%	5.81%	3.49%	0.00%	1.16%
Effectively use the computer	48.84%	41.86%	1.16%	0.00%	1.16%	6.98%
Effectively use the LMS	45.35%	43.02%	1.16%	3.49%	1.16%	5.81%
Adequate interaction with course content	37.21%	54.65%	4.65%	2.33%	0.00%	1.16%

Research Question Five

The final objective of this study was to understand the perceptions of faculty members, who taught online and face-to-face sections of the same course; perceptions regarding the quality of instruction; immediacy; the level of engagement between

themselves and students; and the level of engagement among students in class. Faculty interviews were conducted to understand these perceptions. A total of eight interviews were conducted. Each interview was in-person, audio recorded, and later transcribed.

The interviewees were chosen from different departments within the institution, and each interview lasted approximately half an hour with the shortest interview being 26 minutes and the longest being 44 minutes. The findings of the interviews are presented in four general headings: (1) Perceptions of faculty engagement with students; (2) Perceptions of student engagement with other students and material; (3) Perceptions of technology skills and support; and (4) Perception of benefits and drawbacks of online courses.

Each interview began with three classification questions detailing the number of years taught and preferred delivery system. The minimum number of years taught was eight with a maximum of 29, and each interviewee had taught at least five years online with an average of nine years of online teaching. When asked which delivery system was most preferred, the consensus was a preference for face-to-face courses, with three participants not having a stated preference and one stating, "I actually like the variety. It's nice. I don't think I would want to do completely online and completely face-to-face." Five participants stated a preference for teaching face-to-face courses because of the "contemporaneous nature," the ability to "be myself," "I can see their faces. I can see if someone has a question.," and the ability to "read" the students. The emergent theme of the participants which indicated a preference for face-to-face course was immediacy as defined by Mehrabian (1967).

Perceptions of faculty engagement with students. To gain an understanding how faculty perceived their engagement with students, each participant was asked if he or she was able to better interact and engage with students in an online course or traditional face-to-face course. Seven of the eight participants indicated they were better able to engage with students in face-to-face class. When asked why they feel engagement was better in face-to-face classes, the theme of immediacy emerged again. Faculty members discussed the ability to see their students and read facial expressions and other non-verbal cues. One participant mentioned the ease with which you can have a conversation in a face-to-face environment. Another participant acknowledged the difficulty of having students participate in class discussion and gave the following statement: "It is hard enough to get them [students] to talk, and usually with face-to-face classes, if you can get one or two students to ask questions, that usually opens up discussion … which creates more engagement." Another benefit offered by a participant was the ability to solve student problems real-time in class as opposed to trying to solve the problem online through email.

One participant had a dissenting opinion stating he originally thought face-to-face courses offered a better chance at student engagement, but that opinion had changed with time. The rationale for the participant's change came from student in-class behavior. The participant noted,

> I used to think face-to-face was, but actually there [are] a lot of students that when they come to class, it is just seat time. You know they are there, but I can see them on their phones doing other things, so I have to question: Are they really engaged in the classroom? I don't think they are.

The participant further noted face-to-face classes "theoretically" offer a greater chance to engage with students, but discussion boards and other online tools allow you to interact "fairly well."

Later in the interview, after a discussion of different forms of engagement, participants were asked which course delivery system they felt provided the best way to engage the students. No clear consensus was reached. Three of the eight participants felt face-to-face provided the best way to engage with students. One participant felt it was to engage with students when in the same room with them. However, one of those participants stated, "I think it [face-to-face] is the best, but I think that we have to be realistic and do our best to bring as much as we can to the online courses." Another participant felt disconnected from students in online courses.

Three of the participants felt each delivery system offers a form of engagement separate and unique from the other. One participant said the engagement in each delivery system was "… almost separate but equal." Two participants felt the level of student engagement was based more on the course content and less on the delivery system. One participant used the example of a mathematics course versus a course on philosophy. They felt the course in philosophy, because of the content, offered a greater chance for engagement because of the discussion of heavy content in the course versus a mathematics course, which "typically" does not have the same rich set of discussion topics.

The participants were asked if they felt online classes offered the opportunity to make students feel a part of a learning community. While the participants could not provide a concrete definition of a learning community, there was a conglomeration of

ideas expressed to communicate the challenges in creating an effective learning community. Two participants indicated the challenge of creating a learning community was not based on the delivery system but the course content. Again, using the example of a mathematics course, one participant said he had seen this in past math courses. At times, if a strong student emerges in the course, that student can play a tutoring role and a learning community would grow organically from the learner-learner interactions.

Three participants expressed the belief learning communities could be developed in online course with the available technology; however, they did not know how to build the community themselves. One participant felt the only effective way to create a learning environment would be to have students meet in a face-to-face session at the start of the semester so the students could dissolve the anonymity of an online course by allowing students to place a face to a name. Two participants did not feel it was possible to effectively create a learning community in an online course. One felt it would not possible with an online course of random students but would be possible if all the students in the course had taken courses together in the past, similar to a cohort of students which flows through an academic program as a cohesive group.

The last question regarding student engagement asked participants to consider the role social media has in fostering student engagement. All participants expressed similar thoughts on the use of social media. Universally, no participant felt social media was, or would be, an effective tool for student engagement. Only one participant actively used social media, Facebook, in classes and expressed the very low rate with which students interacted on the Facebook page. Another participant stated the issue of using social media in a classroom was the fluid and dynamic nature of it. The social media platform

of choice changed so frequently and made it too difficult to effectively apply semester after semester. Two of the eight participants expressed reticence to use social media, because the tools provided by the Learning Management System emulated popular social media tools, and it was better to keep the students within the Learning Management System.

Perceptions of student engagement with other students and material. To better understand how faculty perceived a student's engagement with other students and the course material, each participant was asked two questions. The first question focused on how the participant felt discussion boards in online courses encouraged students to interact and engage with each other. Of the eight participants, only one immediately responded with an unequivocal negative response on the use of discussion boards and provided specific examples of how he has failed to achieve meaningful student interactions. This participant identified two main issues with discussion boards. The first was the rigid structure and rules usually placed on discussion boards to encourage student interactions. An example given, which was also given by three other participants, would be having students make an initial post by a specific day, with some number of responses posted a few days later, and perhaps each post had an arbitrary word count requirement. The participant did not feel these rules aided in student interactions, stating, "When you look at a conversation, that's not the way conversation works."

The second issue identified by the participant was a trend toward "low-quality" posts and responses. Meaning, students write to meet a deadline or word count requirement, not for content or in the hopes of creating a conversation. This participant

was the only one of the eight to have completely removed discussion boards from online courses and replaced them with other tools, such as, journals, wikis, and blogs.

No one interviewed perceived discussion boards to be universally helpful in fostering student interactions and engagement. Three of the eight participants felt discussion boards could be useful but would be dependent upon the student population in the class and those students' ability to effectively express their thoughts in writing. Two of the participants believed discussion boards were better used in graduate courses as opposed to freshman and sophomore courses. One participant stated discussion boards are not the best tool for student interactions, but "discussion boards are so common … there is not a learning curve for students, they kind of know how to do it. They can go in there and get that engagement right off the bat."

In general, of the seven participants who still used discussion boards for their online courses, the overall themes were resigned acceptance of their use because of a lack of better options. One participant indicated no longer using discussion boards to encourage engagement but as a tool to reflect on the material, and graded students based on "theoretical perspectives" of the discussion board posts, as opposed to grading based on interactions with other students. Overall, all interviewed felt discussion boards should exist in a framework provided by the instructor, but the instructor should not actively participate in the discussions between students. One participant stated, "I'm not going to respond to every single discussion, because I wouldn't do that in my face-to-face classes when students are having group discussions."

The last question was regarding student online interactions. Participants were asked if they felt students in online courses had adequate interaction with the course

material. No clear consensus was found on this topic. Four of the eight participants felt students get adequate interaction with the course material. One participant stated,

> I really do [feel students get adequate interaction] because of the amount of reading they have to do that they wouldn't have to do in a seated course. I think that in a seated course, it would be very possible for a student to come to class and pay attention and never open the book

Another participant felt online students inherently get more interaction with the material because of the self-directed nature of an online course. She gave the example, "I'm finding a very interesting trend that they [students] are interacting with the course material because instead of emailing me for an answer, they are searching for answers on their own before emailing me."

Of the four participants who did not feel students get adequate interaction with the material, one participant indicated the lack of interaction was not isolated solely to online courses but thought students across all delivery systems lack meaningful interaction with course material. The participant stated it clearly, "I would say not really, but then the face-to-face students don't read the book either." The remaining three participants felt students in online courses were not getting the same level of interaction as peers in traditional face-to-face courses because of the lack of structure and disconnected nature of online courses.

Perceptions of technology skills and support. During the interviews, the participants were asked about the technology skills for themselves and their students. They were asked to discuss their comfort with the Learning Management System, technology in general, and the support they received from the institution. They were also

asked how they perceived the technology skills of their students related to both the

Learning Management System and technology in general.

The responses were unanimous regarding the participants skills using the

Learning Management System. Every person interviewed felt they had an adequate to

advanced understanding of how to use the Learning Management System. One

participant said,

> I am very confident in my ability to interact with the Learning Management
>
> System and technology, but it is something that I have actively made sure I am
>
> able to do, because I realized that the only option here is to make online classes
>
> good, and part of that is really being proficient with the technology.

Three of the participants indicated they did not know all the parts offered by the Learning

Management System but would be comfortable learning if required. Furthermore, each

participant felt he or she was comfortable with technology skills in general and did not

feel intimidated using technology or teaching online. When asked how they perceived

support from the institution, again, the results were unanimous. They felt the technology

and Learning Management System worked without trouble. All stated they had positive

experiences working with the Distance Learning Center and Information Technology

staff and felt when issues occurred the staff were friendly, supportive, and timely in their

response.

The views on students' technology skills were not as unified. Each participant felt

students taking online classes had no issues using the Learning Management System or

the issues the students experienced were small and easy to address via email. However,

when asked about students' technology skills in general, three of the participants felt

students were underprepared. All three discussed the challenge students face in managing files, uploading attachments, compressing files, and basic email etiquette. One participant stated,

> I think that students, in my experience, lack a little bit of Windows. They lack some real basic things that you think they know, like how to manage files. I think they struggle with that where you wouldn't think they would, but they do.

Another participant discussed the lack of skills students have effectively using word processing saying, "90% of the online students" did not know "how to paginate their Microsoft Word file." Despite these perceived gaps in skills, no participant felt the gaps represented a challenge that could not be overcome, with one participant saying, "They seem to catch on to things pretty quickly."

Perception of the benefits and drawbacks of online courses. Each participant was asked to give perceived benefits and drawbacks of online courses. One of the perceived benefits of online courses, which all eight participants articulated, was the freedom online courses provide students. The unanimous benefit was the flexibility students gain in online education. Online courses allow students to more easily balance the demands of work, life, and education. Four of the eight participants offered additional benefits associated with online courses. Two of the participants believed the nature of online courses forced students to read more than their face-to-face peers. Three of the participants felt online students benefited from the self-directed nature of the course and learned valuable soft-skills such as time management, self-motivation, organization, and more advanced problem-solving skills. One participant stated:

I think there are a couple of different benefits. I think some of the benefits the
students realize. I think the students realize the benefits of convenience and being
able to work around their other schedule. They [students] have jobs, they have
kids, they have other classes. I think that they understand that benefit of online
classes. But I think what benefit the students may not always understand is that
online classes inherently require more initiative on their part, and I think that it is
very valuable, as students have to have more initiative.

The three participants felt these skills were secondary to the course content and not
necessarily skills to which students in a face-to-face course would be inherently exposed.

One participant felt the anonymity provided in online courses could offer students
who suffer from social anxiety an opportunity to take courses at home and avoid potential
trauma from being physically present in class. Another participant felt an additional
benefit to online education was the ability for online courses to more adequately handle
different personality types. When pressed for an example, the participant stated,

There are students [who] are very reticent to participate. A lot of times they don't
think they understand what's going on, perhaps they are shy, there is a number of
reasons why they would feel hesitant to participant in open conversation outside
of just being normally introverted.

The participant felt those students would be better served by the anonymity provided in
an online course.

No consensus was found when discussing the potential drawbacks to students
enrolled in online courses. Two of the eight participants felt students were missing the
contemporaneous nature of discussions and questions, which occur in face-to-face

courses. One participant stated, "I'm always feeding off what people are saying, and I'm asking questions or going back and forth. Sometimes, I don't think we can go quite as far afield in our discussions in an online environment." One participant felt any potential drawbacks of online courses are not related to all online courses but are limited to specific content. The participant gave an example of teaching students how to read graphs in an online course. It is a more difficult experience for students in an online course, as they are not able to experience the generation and reading of the graphs in real time.

Another participant felt the largest drawback was related to all online courses. He indicated student socialization as the biggest loss for online students. Students are losing the connection with other students, the faculty member, and the campus. Another perceived drawback articulated by one participant was students are not able to witness behavior they should emulate. The participant said,

> In my field, especially early childhood, one of the things we tried to do as early childhood teachers is teaching the way we want our students to teach other children. We want students to emulate the behavior. That is missing in online courses.

One participant felt online courses do not benefit all students and require specific skills to be successful. The participant stated, "I don't think online learning is for everybody. I think you have to have a lot of self-motivation and you have to be disciplined." The participant did not feel these skills should be learned during an online course, but the online course can reinforce these behaviors. Finally, one participant felt there were no potential drawbacks associated with online courses.

Summary

Presented in this chapter were findings from secondary data analysis, student surveys, and faculty interviews. According to these findings, the data supported previous research on differences in student outcomes across delivery systems, but a difference in withdrawal rates and attendance was found. Specifically, from the analysis of final grades, there was no significant difference between online and face-to-face courses, which matches the results of previous research (Nguyen, 2015).

A significant difference was found in withdrawal rates with online courses having a higher rate of withdrawal than traditional face-to-face courses. These results do not match the previous research of Wilson and Allen (2011) who found no significant difference in withdrawal rates. This current study did include a larger sample size from students over a longer period of time, which may account for the difference from the findings of Wilson and Allen (2011).

Lastly, a significant difference in attendance was found, but the data were incomplete. Despite the incomplete data, the number of courses included was larger than the minimum effect size for analysis. The number of absences in face-to-face courses was significantly higher than the number of absences in online courses in this study. No previous research on attendance rates was found and represented an area of interest for future research. The importance of regular attendance is a well-documented part of student success, because students who regularly attend class have better outcomes (Navarro Jover, & Martínez Ramírez, 2018).

The results of student surveys indicated a clear preference for seated courses and a greater perception of engagement and interaction with other students and faculty in

seated courses. However, students felt they had adequate interaction with the course material in an online course but did indicate perceptions of engagement are better in seated courses. Lastly, students indicated feeling comfortable using technology and the Learning Management System when taking online courses.

The faculty interviews were separated into four categories: (1) Perceptions of faculty engagement with students; (2) Perceptions of student engagement with other students and material; (3) Perceptions of technology skills and support; and (4) Perception of the benefits and drawbacks of online courses. Faculty members were not in consensus on the ability to engage with students in an online course but were more confident about the challenges faced when trying to create a learning community in an online course. Faculty members did not feel discussion boards or social media made good tools to encourage engagement between students. The faculty felt students had the same amount of interaction with the material in an online course as in face-to-face courses.

Faculty members felt comfortable with use of the Learning Management System and technology in general and had responsive support if a problem arose. Faculty are less optimistic about the general technology skills of students; however, all faculty agreed students do have the skills necessary to use the Learning Management System. Lastly, faculty members believed online courses provided benefits for students. The benefits included an easier balance between education, family, and work; the learning of non-content soft-skills; and the ability for online courses to address the various needs of students. Online courses also offer potential drawbacks with a lack of engagement and in-class discussion as the main concerns.

In the next chapter, the findings are further developed and discussed along with the final conclusions of the analyses. The complete analyses presented in this chapter along with the review of current literature from chapter two are used to draw final conclusions. Lastly, recommendations for future research are given.

Chapter Five: Summary and Conclusions

The traditional face-to-face classroom is slowly being replaced with online classrooms, leaving educators and educational researchers interested in how the change to online learning is impacting students (Nguyen, 2015). The growth of online education has also caught the attention of educational administrators as a tool to help reduce cost and increase student outreach (Allen & Seaman, 2016). The trend of increased online courses has grown steadily and shows no signs of slowing (Cavanaugh & Jacquemin, 2015). Because of the growth in online education, it is incumbent upon educators, administrators, and researchers to question whether students enrolled in online classes are as successful as their peers in face-to-face courses.

Beyond the success of students in online courses, it is important to focus on other areas which impact students (Nguyen, 2015). One such area of interest is student engagement. Engagement is essential to student success, and the question of whether students experience the same level of engagement across the delivery systems should be examined (Lei, Cui, & Zhou, 2018). While many factors have an influence on student outcomes (Schneider & Preckel, 2017), how students are engaged is a factor which changes between delivery systems (Nguyen et al., 2018).

With the continued growth of online education and the important role student engagement plays in student success, the purpose of this study was to measure the academic performance, withdraw rates, and attendance between face-to-face and online courses. Furthermore, the perceptions of engagement were measured from the point of view of the students and faculty members. To measure the academic performance between the two delivery systems final course grades, withdrawal rates, and attendance

was obtained from a Midwest Community College for one academic year (Fall 2017, Spring 2018, and Summer 2018). The data were quantitatively analyzed, and the findings were examined. To understand perceptions of engagement, a random sample of students were asked to participate in a survey. Perceptions of engagement from the faculty perspective were obtained by interviews. The summary of the findings, the answers to all five research questions, comprehensive conclusions, implications of practice and recommendations for future research are presented in this chapter.

Findings

The findings of the research are presented along with each research question. It is important to restate a few limitations of this study. The first limitation was determining whether a student has been successful in an online course. In this study, the final course grade was used to determine student success. This decision was based on previous research (Chingos, Griffiths, Mulhern, & Spies, 2017; Stack, 2015); however, final course grades may not the be best indicator of student success (Krentler & Willis-Flurry, 2005). While this is a limitation of the study, academia has been unable to successfully address this issue (Wise & Smith, 2016), and that determination was beyond the scope of this study. However, student learning outcomes are the same for similar courses across all delivery systems and help to mitigate the limitation. All secondary data were taken from the institution's Student Information Management System (SIS); the data were dependent on the precision of data originally entered and on the precision of data extracted by the college's Department of Institutional Research. Lastly, the primary investigator was employed at the institution at the time of this study, and the employment represented a potential bias.

Research question one. 1. *What is the difference between the final grades of students who are enrolled in identical online courses and the final grades of students who are enrolled in identical courses receiving face-to-face instruction?* From the analysis of the data, no significant difference existed between the outcomes of students enrolled in face-to-face courses versus their peers enrolled in online courses. This result matches the previous research of Nguyen (2015).

Research question two. *What is the difference in withdrawal rates between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction?* Based on the analysis of the secondary data, a significant difference in withdrawal rates existed between face-to-face and seated courses. Withdrawal rates for students in face-to-face courses was 8.39%, whereas the withdrawal rate was 10.30% for online courses.

Research question three. *What is the difference in attendance between students who are enrolled in identical online courses and students who are enrolled in identical courses receiving face-to-face instruction?* A significant difference in the number of absences between face-to-face and online courses was found. As mentioned earlier, one of the limitations of this research was the quality of data. The attendance data were incomplete. The sample size for student outcomes and withdrawal rates was ($n = 1{,}663$). However, the attendance for those classes was incomplete, and the sample was reduced to ($n = 1{,}471$). To address this limitation, the effect size, with a given delta of 0.10 was calculated at 1,301. Therefore, the sample of 1,471 was large enough to proceed with the analysis (Ary et al., 2019).

Research question four. *Among students who are enrolled in online and face-to-face courses, what are their perceptions regarding the quality of instruction, immediacy, and the level of engagement with the course instructor and other students?* To better understand students' perceptions of engagement, a survey instrument was used. The survey was sent to a random sample ($n = 1000$) of students with a response rate of 11.1%. Of the responses, only 86 were complete and used in the analysis. The overall results showed a preference for face-to-face courses over online courses, a perception that all forms of engagement are worse in online courses, and interactions were better in seated courses.

Research question five. *Among instructors who teach identical sections of a course using online and face-to-face delivery systems, what are their perceptions regarding the quality of instruction, immediacy, the level of engagement between themselves and students, and the level of engagement among the students in class?* To understand faculty perceptions of engagement, eight faculty members were interviewed. Each interview lasted approximately half an hour and was recorded and transcribed to aid in analysis.

Based on the analysis, the faculty interviews were separated into four categories: (1) Perceptions of faculty engagement with students; (2) Perceptions of student engagement with other students and material; (3) Perceptions of technology skills and support; and (4) Perception of the benefits and drawbacks of online courses. The participants did not reach a consensus on their ability to engage students in an online course, but seven of the eight indicated engagement was better in face-to-face courses. This finding matched the response from the student survey in which students felt

engagement was better in a face-to-face course. The participants were in consensus that discussion boards were not effective in promoting or sustaining student engagement. The faculty's feelings were stronger on the belief that social media was poorly suited to aid in student engagement. When asked about student interaction with the course material, the participants felt students have the same amount of interaction with the material in an online course as in face-to-face courses.

When asked about technology skills, faculty felt comfortable with their use of the Learning Management System and technology in general and indicated a robust support system in place if technology issues occurred. Regarding students' comfort with technology, the participants were less optimistic. Indicating students lacked the general technology skills needed for online courses, but conceded students had the skills necessary to use the Learning Management System. This finding is interesting because 84.49% of students surveyed felt they were able to effectively use the computer in an online course.

Lastly, faculty members believed online courses provided benefits for students which included: easier balance between education, family, and work; the learning of non-content soft-skills; and the ability for online courses to address the various needs of students. For example, online courses could offer students with social anxiety an avenue to participate in class without the associated potential trauma of physically being in class. The participants also identified potential drawbacks of online education, with lack of engagement and in-class discussion as the main themes.

Conclusions

The following are conclusions based on the results of the study with regard to differences in the perception of engagement and student success between traditional face-to-face courses and online courses. The conclusions are presented in the same order as the findings. After the conclusions are enumerated, implications for practice and recommendations for future research are presented.

Research question one. The findings associated with the first research question match previous research (Nguyen, 2015) and is further evidence of the need to move beyond student outcomes to address other impacts of online education on student success. As Nguyen (2015) stated, "There is robust evidence to suggest online learning is generally at least as effective as the traditional format" (p. 309). The results of this study support the robust evidence to which Nguyen (2015) referred and highlights the importance of this research and examination of student engagement across the different delivery systems. Student engagement is an important aspect of student success (Lei et al., 2018), and student engagement can improve aspects of education including the overall quality of education, increase in student GPA, increase in student retention, and increase of completion rates (Young et al., 2017).

Research question two. There is not a wealth of research on which to judge the results regarding withdrawal rates in online courses compared to face-to-face courses, and this topic represents a rich area for future research. One possible explanation for the differences in withdrawal rates could be the student's preference for traditional face-to-face courses. Nearly three-fifths (58%) of the students surveyed indicated they preferred face-to-face courses. However, the preference may change as online education continues

to grow and more students move into online courses (Tracking Online Education in the United States, 2016).

Another possible reason for the difference in withdrawal rates could be perceived student engagement. Young et al. (2017) found student engagement is correlated to student completion, and student engagement is important regardless of the delivery system (Ghassemi, 2016). When students were asked how they perceived engagement in online courses, the students largely disagreed with the statement that online courses offer better engagement. More so, seven of the eight faculty members interviewed indicated they were better able to engage with students in face-to-face classes. Given those results, it seems student preference for face-to-face courses, coupled with a lack of perceived engagement in online courses, might explain the increase in withdrawal rates.

Research question three. Care should be given before generalizing the findings regarding attendance rates in online courses compared to face-to-face courses in this study. Two issues with the data should be noted. The first was the missing and incomplete data. While the sample was within the range calculated by the effect size, the data were incomplete, which could lead to an invalid conclusion (Ary et al., 2019). Second, the determination of attendance in an online class was subjective, unlike the objective binary choice of attendance in a face-to-face course. The determination of the attendance was left to each faculty member and determining metrics by which attendance was decided was beyond the scope of this study.

Because the determination of attendance in online courses was not standardized, this may have skewed the results of the analysis. The question of attendance should be addressed despite the limitations mentioned, because attendance is positively correlated

with student outcomes (Akhtar, Warburton, & Xu, 2017). In this study, no significant difference was found in student outcomes between online and face-to-face courses; however, a significant difference in attendance rates was found. Because of the relationship between attendance rates and student outcomes, the findings of this study engender a question: What explains the large difference in attendance between online and face-to-face courses, and why does the difference in attendance not impact student outcomes? Given the findings, it seems attendance rates and withdrawal rates represent areas of interest for future research. Further research is needed to overcome the limitations of the attendance data in this study and determine if the findings were an irregularity.

Research question four. The response rate for the student surveys was low, at 11.1%. Therefore, it is important to note the low response rate as a limitation of the study and the results may represent a response bias (Creswell & Guetterman, 2019). Because of the low response rate those students who responded may not provide a correct representation of students' perceptions. Creswell and Gutterman (2019) stated, "Response bias occurs in survey research when the responses do not accurately reflect the views of the sample and the population" (p. 401).

The result of students indicating a preference for face-to-face courses versus online courses is surprising given the growth and expansion of online education (Jo, Kim, & Yoon, 2015; Shuck, 2016). Moreover, the results did not match the findings of previous research, which indicated a preference for online courses when available (Jones & Blankenship, 2017). One possible explanation for this discrepancy could be the small number of respondents to the survey.

The students were asked to indicate their level of agreement based on a series of statements on engagement. Students felt engagement in face-to-face courses was better than in online courses, which matched the perceptions of teachers who also indicated engagement was better in face-to-face courses. When asked to consider online courses, the students indicated adequate interaction with other students and feeling part of a learning community, which did not match the perceptions from teachers who indicated students did not have adequate engagement with other students and did not feel able to create a learning community in online courses.

Students indicated strong agreement with statements of their ability to use technology and the Learning Management System, and access adequate support from the institution. The perceptions of students' ability to use technology and the Learning Management System only partially matched the perceptions teachers have on the same question. Teachers felt students could use a Learning Management System effectively but felt students lacked general technology skills. The effective use of technology is important because online courses require students to be comfortable with the technology, as indicated by Nandi, Hamilton, Harland, and Mahmood (2015) who found technology support should be provided by the school starting early in the course to ensure students can effectively use technology and fully participate in online courses. Students also felt the instructor had adequate technology skills to teach effectively online.

Research question five. The conclusions based on the faculty interviews are broken into four parts: (1) Perceptions of faculty engagement with students; (2) Perceptions of student engagement with other students and material; (3) Perceptions of technology skills and support; and (4) Perception of benefits and drawbacks of online

courses. The participants had at least nine years of online teaching experience and were chosen by the researcher using judgment sampling from different departments within the institution. Despite the number of years of online teaching, five of the eight participants stated a preference for face-to-face courses, with the remaining three not having a clear preference.

Considering the perceptions of student engagement, the participants indicated engagement was better in a traditional face-to-face course. The rationale given was the belief it is easier to emulate immediate behaviors, as defined by Mehrabian (1967). The preference for face-to-face courses was similar to students' beliefs engagement was better in face-to-face courses. This finding is notable because engagement is positively correlated to immediacy (Gilchrist-Petty, 2017) and engagement, specifically teacher engagement, has an important role in education (Roorda, Jak, Zee, Oort, & Koomen, 2017). The perceived lack of engagement in online courses, from both the faculty and student viewpoint, may have been a key factor in the increased absenteeism and withdrawal rates in online courses.

Each participant was asked to consider which delivery system offered the better ability to achieve meaningful engagement. Three of the eight participants felt each delivery systems offered a form of engagement separate and unique from the other, which matched the findings of Oh and Lee (2016). Three of the participants felt face-to-face classes represented the best delivery system because of the immediate nature of being in the classroom with students. The engagement to which the three participants were referring was between teachers and students. Immediacy, as defined by teacher-student interaction, plays an important role in the educational process (Gilchrist-Petty, 2017).

The faculty's belief that engagement is better in face-to-face classes mirrors how students felt about engagement. Students indicating a belief engagement was better in face-to-face courses. The ability for a student to engage with the content and the instructor are predictors of student satisfaction in online courses (Kuo & Belland, 2016) and may explain the differences in withdrawal and attendance rates between the two delivery systems.

Neither the faculty interviewed, nor students surveyed felt social media was useful in engagement. However, Froment et al. (2017) and Al-Dheleai et al. (2017) found social media in student-teacher interaction had a positive impact. Furthermore, Raspopovic et al. (2017) found using social media elements in classrooms lead to higher student satisfaction, increased communication with teachers and peers, and a better understanding of course topics. The participants did not feel discussion boards were effective in encouraging student engagement, with one participant dropping discussion boards completely from his online courses.

Moreover, the belief that faculty members should provide a framework but not play an active role in discussions on discussion boards is supported by previous research (Annamalai, 2018). According to Annamalai (2018), the interactions between students must be mediated by the faculty member. If the interactions between students are not supervised by the faculty member, then the interactions will not be significant (Annamalai, 2018). However, Jones and Blankenship (2017) found discussion boards require social interaction and consistent feedback from the instructor to be effective.

The participants were asked if it was possible to create an effective learning community in an online course. Overwhelmingly, the response was, "no". When

students were asked the same questions, the response was an overwhelming, "yes." They did feel part of a learning community. The students' responses make sense in context. Students who have more frequent interactions build a learning community, which encourages all students to stay committed to online learning (Oh & Lee, 2016).

Perhaps the belief students are able to engage with their peers frames the belief they are part of a learning community. It is important a framework is in place for students enrolled in online courses to experience a sense of social cohesion (Madland & Richards, 2016). Students reported feeling a sense of cohesion when faculty members did not. The differences in perceptions on building a learning community and engagement between students represent an area for future research. During the interviews each participant had an opportunity to share how he or she felt about student engagement with the material in online courses. Both the faculty interviews and the student surveys elicited the same perception that online courses offered adequate interaction with the course material.

The participants were asked if they felt they had adequate technology skills and support to effectively teach online. All participants felt they had the skills required to effectively use the Learning Management System and technology in general and felt they had adequate support from the institution. However, faculty members did not feel students had adequate technology skills. Technology skills play an important role in engagement in online courses (Kuo & Belland, 2016).

Lastly, all participants were asked to access potential benefits and drawbacks of online courses. The participants felt online education offered students great flexibility to balance education with work and other obligations. Those responses supported previous

research by Jayaratne and Moore (2017), which found students enroll in online courses because of the convenience and flexibility they offer. Despite the greater flexibility, the participants in this study still preferred face-to-face courses.

When discussing potential drawbacks, participants indicated students missing in-class synchronous discussions was a significant drawback. It is a valid concern as Lowenthal, Snelson, and Dunlap (2017) found most online courses still rely on asynchronous, text-based communication, and using live synchronous web meetings during office hours provided some of the non-verbal immediate behaviors which aid in student engagement. Despite the perceptions of a lack of interaction and engagement as a drawback, Cole et al. (2017) found the students' perceptions of teacher presence, not the actual level of teacher presence, in online classes was the stronger prediction of success.

Implications for Practice

One aspect of this study was to address a gap in current research regarding outcomes in online versus face-to-face courses (Cavanaugh & Jacquemin, 2015; Nuygen 2015). The study was successful in taking a longitudinal view of student outcomes for a complete academic year across multiple disciplines and verifying previous research (Nuygen, 2015). The questions of any significant difference in learner outcomes between the different delivery systems was addressed. Therefore, educational institutions should focus efforts on other objective measures of students' success, namely attendance and withdrawal rates, which are not the same across the delivery systems.

Educational institutions should also develop more objective measures of attendance in an effort to gain a better understanding of how the delivery system impacts student attendance. This can be obtained by asking students to volunteer rationales for

excessive attendance issues. The institution in this study used a centralized system to track attendance, and minimal effort would be required to create an automated message to students with excessive absences to solicit a rationale for those absences.

There is a need to gain a more fine-grained understanding of how students and faculty perceive engagement and how the perception of engagement differs between the two groups. One recommendation would be to ask students specific questions about engagement during end-of-semester surveys. Faculty could also complete a similar post-semester survey to capture how the two groups (faculty and students) perceived engagement. It is not as important to measure actual engagement or interaction. The *perception* of interaction rather than the *objective* measurement of interaction is the significant predictor of student learning and satisfaction (Fulford & Zhang, 1993). Furthermore, Woods and Baker (2004) determined a student's perception of adequate interaction with the teacher and peers is positively correlated to increased learning and course satisfaction. Because the perceptions of engagement are so important, these perceptions should be captured and analyzed at the completion of every semester.

Recommendations for Future Research

From the results, it is clear a few directions for future research exists. The first recommendation is the further investigation of the difference in withdrawal rates between the delivery systems. Engagement has an important role in keeping students enrolled in a course (Kuo & Belland, 2016); therefore, it would be beneficial to determine if the differences in the withdrawal rates are tied to decreased student engagement in online courses or some other unidentified reason.

Another direction for future research is the impact engagement has on student attendance. Any future studies should address the limitations of this study, which included the incomplete data and lack of a clear standard for measuring attendance in an online course. Attendance has a significant impact on student outcomes (Akhtar, Warburton, & Xu, 2017), and if online courses have better attendance than seated courses, the rationale for the difference should be investigated.

Lastly, this study focused on a very broad definition of engagement. Future research should focus on more concretely defined types of engagement to gain a better understanding of the differences between the perceptions of engagement of faculty and students. A clear understanding of the types of engagement would better guide the development of online course development and perhaps close the gap in attendance and withdrawal rates.

A more fine-grained understanding of perceived engagement should also address the differences between student and faculty perceptions of engagement. Faculty members did not feel students were engaged effectively. Moreover, faculty did not feel they could adequately create a learning environment online. However, students felt they were part of a learning community online and had adequate engagement with other students. To aid in this granular understanding, future studies should focus on collecting more responses from student surveys, which will increase the accuracy of the data and subsequent analysis.

Summary

Online education is becoming an increasingly popular option for students, educators, and administrators (Cavanaugh & Jacquemin, 2015; Gargano and Throop,

2017) with enrollment in online classes experiencing year-to-year consistent growth (Shuck, 2016). Because of increased interest in online courses, it is important to understand the impact online education has on student success. One aspect of education which has a wide-ranging impact on student outcomes is engagement (Lei, Cui, & Zhou, 2018). Nguyen (2015) argued for the need to move beyond student outcomes as the sole measure of success when comparing online and face-to-face courses and recommended to move beyond grades and examine other metrics which impact student success. As mentioned, one area of interest is student engagement.

The impact online education has on student outcomes and the perceptions of engagement from the perspective of students and educators was the focus of this study. Student outcomes, including attendance and withdrawal rates, between online and face-to-face courses over the course of full (Fall, Spring, and Summer) academic year were studied. All courses taught in both online and face-to-face delivery systems were used in the analysis. Overall, the results of this study showed no significant difference in terms of student grades based on delivery system. However, a significant difference was found in withdrawal rates and attendance of students in online courses compared to face-to-face courses.

Perceptions of engagement from the point-of-view of students and faculty members were considered. From the results, students had a preference for face-to-face courses over online courses and felt engagement was lacking in online courses as opposed to face-to-face courses they had taken. The perceived lack of engagement in online courses and the preference for face-to-face courses may explain the differences in withdrawal rates and attendance. However, the number of respondents to the survey was

small, and the question of perceived engagement should be studied further with a larger sample of students. Through the survey instrument, students indicated their confidence using the Learning Management System and technology in general. Students also felt they had adequate interaction with the course material in online courses.

Faculty perceptions of engagement was accessed through in-person interviews. The results of the interviews showed a clear preference for teaching face-to-face, and a belief face-to-face courses offered the best opportunity for engaging students. Faculty members did not feel discussion boards or social media were beneficial in engaging students online. Faculty members also enumerated the potential benefits and drawbacks associated with online courses. The perceptions of engagement between faculty and students did not always align. For example, students felt they had adequate interaction with other students online, including feeling part of a learning community, but faculty members did not feel students were engaged effectively. Furthermore, faculty did not feel they could adequately create a learning environment online.

Findings of the study supported previous research regarding the outcomes between students in online and face-to-face courses (Nguyen, 2015), while adding the analysis of withdrawal rate and attendance. Faculty perceptions differed from student perceptions regarding student engagement in the current study. Due to these findings, gaps were identified, which should be addressed in future research.

It is clear online education is not a trend which will fade with time (Cavanaugh & Jacquemin, 2015). Therefore, educational institutions, educators, and administrators must ensure students who are enrolled in online courses are being served and given the same quality of education as students in face-to-face courses. One area which plays an

important role in student outcomes and changes across delivery systems is engagement (Nguyen et al., 2018). This means educators, researchers, and administrators are responsible for examining perceived engagement and ensuring students in online classes are effectively engaged.

Appendix A

Student Survey Instrument

Classification

1. How would you classify yourself: Degree Seeking, Non-Degree Seeking, Transfer

    Student, Other?

2. What is your gender? (Male, Female, Prefer Not to Say)

3. How many online courses have you completed?

4. How many face-to-face (seated) courses have you completed?

5. Program of Study: Academic, Technical, Career-Vocational, Allied Health,

    Other?

6. What is your preferred course delivery method?

Please indicate the degree to which you agree or disagree with each statement by

selecting the appropriate letters to the right of each statement.

- SA = Strongly Agree

- A = Agree

- UN = Uncertain

- D = Disagree

- SD = Strongly Disagree

- NA = Not applicable

7. I feel the quality of instruction is better in online courses that I have taken when

    compared to the quality of instruction in face-to-face courses I have taken.

8. I feel the quality of instructor engagement and interaction with the instructor is better in online courses I have taken when compared to the quality of instructor engagement and interaction in face-to-face courses I have taken.

9. I feel the quality of engagement and interaction with other students is better in online courses I have taken when compared to the quality of engagement and interaction with other students in face-to-face courses I have taken.

10. I feel I am better able to engage and interact with the course material (content) in online courses I have taken when compared to my ability to engage and interact with the course material (content) in face-to-face courses I have taken.

11. In the past when I have enrolled in an online class, I would have taken a face-to-face class had it been offered or was available to me.

Consider only the online courses you have taken:

12. I feel I had adequate interaction with other students in the class.

13. I feel I was part of a learning community.

14. I feel I was able to effectively use the computer.

15. I feel I was able to effectively use the Learning Management System.

16. I feel I had adequate interaction with the course content.

17. I feel the instructor was effective in using technology.

18. I feel the instructor was effective in using Social Media (Twitter, Facebook, etc.).

19. I feel the instructor was effective in using Discussion boards to facilitate and encourage student discussions.

20. I feel my technology knowledge and skills were adequate for successful performance in my online courses.

21. During my online courses, the technology (i.e., computer software/hardware, communication, internet, etc.) functioned properly with minimal problems.

22. During the online courses I have taken, I had adequate access to technology support from the college or my instructor.

Consider only traditional (seated) courses you have taken:

23. I feel I had adequate interaction with other students in the class.

24. I feel I was part of a learning community.

25. I feel I was able to effectively use the computer (choose NA if you did not need a computer).

26. I feel I was able to effectively use the Learning Management System (choose NA if you did not use Blackboard / Canvas).

27. I feel I had adequate interaction with the course content (material).

Appendix B

Lindenwood IRB Approval

irb@lindenwood.edu
Thu 10/18/2018 2:14 PM

███████████████

Oct 18, 2018 2:14 PM CDT

RE:
IRB-19-45: Initial - A Comparative Analysis of Student Success and Perceptions of
Engagement Between Face-to-Face and Online College Courses

Dear Shane May,

The study, A Comparative Analysis of Student Success and Perceptions of Engagement
Between Face-to-Face and Online College Courses, has been Exempt.

Category: Category 1. Research conducted in established or commonly accepted
educational settings, involving normal educational practices, such as (i) research on
regular and special education instructional strategies, or (ii) research on the effectiveness
of or the comparison among instructional techniques, curricula, or classroom
management methods.

The submission was approved on October 18, 2018.

Sincerely,
Lindenwood University Institutional Review Board

Appendix C

LINDENWOOD

Research Information Sheet

You are being asked to participate in a research study. We are doing this study to compare student outcomes and perceptions of engagement between online and face-to-face courses. During this study you will be asked to provide deidentified data for online and face-to-face courses. The data should include final course grades, attendance, and withdrawal rates. It will take about two hours to gather and de-identify the data requested to complete this study.

Your participation is voluntary. You may choose not to participate or withdraw at any time.

There are no risks from participating in this project. There are no direct benefits for you participating in this study.

We will not collect any data which may identify you.

We will do everything we can to protect your privacy. We do not intend to include information that could identify you in any publication or presentation. Any information we collect will be stored by the researcher in a secure location. The only people who will be able to see your data are: members of the research team, qualified staff of Lindenwood University, representatives of state or federal agencies.

Who can I contact with questions?

If you have concerns or complaints about this project, please use the following contact information:

Shane Carroll May –

Dr. Kathy Grover – kgrover@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

Appendix D

Faculty Interview Questions

Classification

1. How many years have you taught?

2. How many online courses have you taught? How many face-to-face courses?

3. What course delivery system do you most prefer? Why?

Open ended

4. Do you feel you are able to better interact and engage with your students in an online course or traditional face-to-face course? Why? Why not?

5. What are the benefits to offering students online courses?

6. What are your concerns and potential drawbacks for offering students online courses?

7. Do you believe Social Media is beneficial to engaging students? Why? Why not?

8. Do you feel Discussion Boards in online courses encourage students to interact and engage with each other? Why? Why not?

9. Which course delivery system do you feel provides you the best way to engage the students? Why?

10. Do you feel that students in online courses have adequate interaction with the course material? Why? Why not? Please explain and give examples.

11. Do you feel you have an opportunity to make students feel they are part of a learning community in an online course? Why? How do you accomplish that? Why not?

12. Do you feel you are able to effectively use learning technologies in online course? Why? Why not? Explain what you do specifically.

13. Do you feel students have adequate technology skills to be successful in online courses? Why? Why not? Provide examples to support your feelings.

14. Do you feel you have adequate technology skills to teach online? Why? Why not?

15. Do you feel you have adequate skills using a Learning Management System? Why? Why not?

16. Do you feel you are given adequate technology support when teaching online courses? Why? Why not? Share examples.

17. When you teach online do you feel the technology functions properly and with minimal problems? Why? Why not? Share examples.

18. Any other comments you would like to share?

Appendix E

Student Survey Introduction Letter

I would like to enlist your help. I am a graduate student in the School of Education at Lindenwood University. I am conducting a survey on students' perceptions on the quality of instruction, interaction, and engagement in online and face-to-face courses.

Would you please help me by completing this survey, telling me a little about where you are in the educational process; the types of classes (online or face-to-face) you have taken; and your perceptions on the quality of instruction, interaction, and engagement? The survey should only take about 15-20 minutes of your time. Your answers are anonymous and will not affect your grade in any of the classes in which you are enrolled. Only group results will be presented or documented, not individual answers.

Your help with this research is strictly voluntary. You do not have to answer any questions and can discontinue the survey if you choose. Thank you for your time.

If, after careful consideration, you wish to participate, click on the link to the online survey. <link>

Respectfully,

Shane Carroll May

Student Researcher

Appendix F

LINDENWOOD

Survey Research Information Sheet

You are being asked to participate in a survey conducted by Shane Carroll May at Lindenwood University. We are doing this study to compare student outcomes and perceptions of engagement between online and face-to-face courses. The survey will not ask any identifying information. The questions asked will be limited to classification questions and questions regarding perceptions of engagement in classes you have taken. It will take about 20 minutes to complete this survey.

Your participation is voluntary. You may choose not to participate or withdraw at any time by simply not completing the survey or closing the browser window.
There are no risks from participating in this project. We will not collect any information that may identify you. There are no direct benefits for you participating in this study.

<u>WHO CAN I CONTACT WITH QUESTIONS?</u>

If you have concerns or complaints about this project, please use the following contact information:

Shane Carroll May – ▮▮▮▮▮▮▮▮▮▮▮

Dr. Kathy Grover – kgrover@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

By clicking the link below, I confirm that I have read this form and decided that I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand that I can discontinue participation at any time by closing the survey browser. My consent also indicates that I am at least 18 years of age.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this information sheet.

Appendix G

Faculty Interview Introduction Letter

Thank you _____, for taking the time to participate in my research study by sharing your teaching experiences with me. The purpose of this study is to gather instructor perceptions and experiences from instructors regarding the quality of instruction and student engagement in online and face-to-face courses.

I will record our discussion for data analysis purposes. Please feel free to respond openly and candidly as your identity will be kept anonymous. Your name will not be used in either the data analysis or results to ensure that your identity is protected. Keep in mind that your responses will in no way be linked, either directly or indirectly, back to you. Your responses have no bearing on your annual evaluations and will be instrumental in efforts to improve the quality of the online learning experience. You may choose to withdraw from the interview at any time.

Respectfully,

Shane Carroll May

Student Researcher

Appendix H

LINDENWOOD

Research Information Sheet

You are being asked to participate in a research study. We are doing this study to compare student outcomes and perceptions of engagement between online and face-to-face courses. During this study you will asked to participate in a voluntary interview to discuss perceptions of student engagement and interaction in your courses. It will take about six months to complete this study.

Your participation is voluntary. You may choose not to participate or withdraw at any time.

There are no risks from participating in this project. There are no direct benefits for you participating in this study.

We are collecting data that could identify you, such as your name and the courses you teach. Every effort will be made to keep your information secure and confidential. Only members of the research team will be able to see your data.

We will do everything we can to protect your privacy. We do not intend to include information that could identify you in any publication or presentation. Any information we collect will be stored by the researcher in a secure location. The only people who will be able to see your data are: members of the research team, qualified staff of Lindenwood University, representatives of state or federal agencies.

Who can I contact with questions?

If you have concerns or complaints about this project, please use the following contact information:

Shane Carroll May – █████████████████

Dr. Kathy Grover – kgrover@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

References

Abuatiq, A., Fike, G., Davis, C., Boren, D., & Menke, R. (2017). E-learning in nursing: Literature review. *International Journal of Nursing Education*, *9*(2), 81-86.

Akers, R. (2017). A journey to increase student engagement. *Technology and Engineering Teacher*, *76*(5), 28.

Akhtar, S., Warburton, S., & Xu, W. (2017). The use of an online learning and teaching system for monitoring computer aided design student participation and predicting student success. *International Journal of Technology & Design Education*, 27(2), 251–270.

Al-Dheleai, Y. M., & Tasir, Z. (2017). Using Facebook for the purpose of students' interaction and its correlation with students' academic performance. *Turkish Online Journal Of Educational Technology - TOJET, 16*(4), 170-178.

Alahmar, A. T. (2017). The influence of social networks on the grades of medical students at University of Babylon, Iraq. *Journal of Medical & Allied Sciences*, 7(2), 108-113. doi: http://dx.doi.org.proxy01.nwacc.edu:2048/10.5455/jmas.263824

Allen, I. E., & Seaman, J. (2016). Online report card: Tracking online education in the United States. *Babson Survey Research Group*.

Amro, H. J., Mundy, M. A., & Kupczynski, L. (2015). The effects of age and gender on student achievement in face-to-face and online college algebra classes. *Research in Higher Education Journal*, *27*.

Anderson, J. F. (1979). Teacher immediacy as a predictor of teaching effectiveness. *Communication Yearbook III* (pp. 543-559). New Brunswick, NJ.: Transaction Books.

Annamalai, N. (2018). A case study of the online interactions among ESL students to complete their narrative writing task. *Malaysian Online Journal Of Educational Technology*, *6*(1), 1-17.

Ary, D., Jacobs, L. C., Sorensen, C. K., & Walker, D. A. (2019). *Introduction to research in education*. Boston, MA: Cengage.

Asarta, C. J., & Schmidt, J. R. (2015). The choice of reduced seat time in a blended course. *The Internet and Higher Education*, *27*, 24–31

Ayçiçek, B., & Yanpar Yelken, T. (2018). The effect of flipped classroom model on students' classroom engagement in teaching English. *International Journal of Instruction*, *11*(2), 385-398.

Ayodele, O. D. (2017). Class attendance and academic performance of second year university students in an organic chemistry course. *African Journal of Chemical Education*, *7*(1), 63-75.

Azevedo, R. (2015). Defining and measuring engagement and learning in science: Conceptual, theoretical, methodological, and analytical issues. *Educational Psychologist*, *50*(1), 84-94.

Barkley, E. F. (2017). Terms of engagement: Understanding and promoting student engagement in today's college classroom. *Deep Active Learning: Toward Greater Depth in University Education*, *35*.

Bolkan, S., Goodboy, A. K., & Kelsey, D. M. (2016). Instructor clarity and student motivation: Academic performance as a product of students' ability and motivation to process instructional material. *Communication Education*, *65*, 129-148. doi: 10.1080/03634523.2015.1079329

Bonafini, F. C., Chae, C., Park, E., & Jablokow, K. W. (2017). How much does student engagement with videos and forums in a MOOC affect their achievement? *Online Learning*, *21*(4).

Bryman, A., & Bell, E. (2015). *Business research methods*. Cambridge, United Kingdom: Oxford University Press.

Burch, G. F., Heller, N. A., Burch, J. J., Freed, R., & Steed, S. A. (2015). Student engagement: Developing a conceptual framework and survey instrument. *Journal of Education for Business*, *90*(4), 224-229. doi:10.1080/08832323.2015.1019821

Canals, L., & Robbins, J. (2017). An exploratory study of feedback practices for written and oral tasks in an online English course. CALL in a climate of change: Adapting to turbulent global conditions–short papers from *EUROCALL* 2017, *62*.

Carver, L. B., Mukherjee, K., & Lucio, R. (2017). Relationship between grades earned and time in online courses. *Online Learning*, *21*(4).

Cavanaugh, J. K., & Jacquemin, S. J. (2015). A large sample comparison of grade based student learning outcomes in online vs. face-to-face courses. *Online Learning*, *19*(2).

Che Nidzam, C. A., Shaharim, S. A., & Mohd Faizal Nizam, L. A. (2017). Teacher-student interactions, learning commitment, learning environment and their relationship with student learning comfort. *Journal of Turkish Science Education*, *14*(1)

Chingos, M. M., Griffiths, R. J., Mulhern, C., & Spies, R. R. (2017). Interactive online learning on campus: Comparing students' outcomes in hybrid and traditional courses in the university system of Maryland. *The Journal of Higher Education*, *88*(2), 210-233.

Chu, Y. W. L., & Gershenson, S. (2018). High times: The effect of medical marijuana laws on student time use. *Economics of Education Review*, *66*, 142-153.

Ciabocchi, E., Ginsberg, A., & Picciano, A. (2016). A study of faculty governance leaders' perception of online and blended learning. *Online Learning*, *20*(3), 53-73.

Cole, A. W., Nicolini, K. M., Anderson, C., Bunton, T., Cherney, M. R., Fisher, V. C., & Allen, M. (2017). Student predisposition to instructor feedback and perceptions of teaching presence predict motivation toward online courses. *Online Learning*, *21*(4).

Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* New York, NY: Pearson.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Thousand Oaks, CA: SAGE.

Cutler, C. W., Parise, M., Seminario, A. L., Mendez, M. J. C., Piskorowski, W., & Silva, R. (2016). Should attendance be required in lecture classrooms in dental education? Two viewpoints: Viewpoint 1: Attendance in the lecture classroom should be required and Viewpoint 2: Attendance should be required in the lecture classroom. *Journal of Dental Education*, *80*(12), 1474-1478.

Czerkawski, B. C., & Lyman, E. W. (2016). An instructional design framework for fostering student engagement in online learning environments. *TechTrends*, *60*(6), 532-539.

Dalkiran, O. (2018). Investigation of relationship between theoretical practice course success and attendance. *Journal of Education and Training Studies*, *6*(5), 189–193

Den Harder, A. M., Frijlingh, M., Ravesloot, C. J., Oosterbaan, A. E., & van der Gijp, A. (2016). The importance of human–computer interaction in radiology e-learning. *Journal of Digital Imaging*, *29*(2), 195-205.

Dixson, M. D., Greenwell, M. R., Rogers-Stacy, C., Weister, T., & Lauer, S. (2017). Nonverbal immediacy behaviors and online student engagement: Bringing past instructional research into the present virtual classroom. *Communication Education*, *66*(1), 37-53. doi:10.1080/03634523.2016.1209222

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., ... & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. *Medicine and Science in Sports and Exercise*, *48*(6), 1197.

Douglas, J. A., Douglas, A., McClelland, R. J., & Davies, J. (2015) Understanding student satisfaction and dissatisfaction: An interpretive study in the UK higher education context. *Studies in Higher Education*, *40*(2), 329-349.

Durksen, T. L., Way, J., Bobis, J., Anderson, J., Skilling, K., & Martin, A. J. (2017). Motivation and engagement in mathematics: A qualitative framework for teacher-student interactions. *Mathematics Education Research Journal*, *29*(2), 163-181.

Edwards, F. (2018). *The relationship between college student attitudes towards online learning based on reading self-efficacy, ethnicity, and age.* (Doctoral dissertation.) Retrieved from https://digitalcommons.liberty.edu/doctoral/1729/

Erwin, H., Fedewa, A., & Ahn, S. (2017). Student academic performance outcomes of a classroom physical activity intervention: A pilot study. *International Electronic Journal of Elementary Education*, *4*(3), 473-487.

Estepp, C. M., & Roberts, T. G. (2015). Teacher immediacy and professor/student rapport as predictors of motivation and engagement. *NACTA Journal*, *59*(1).

Froment, F., Garcia, A. J., & M Rocío, B. (2017). The use of social networks as a communication tool between teachers and students: A literature review. *TOJET : The Turkish Online Journal of Educational Technology*, *16*(4).

Fulford, C. P., & Zhang, S. (1993). Perceptions of interaction: The critical predictor in distance education. *American Journal of Distance Education*, *7*(3), 8–21.

Gardner, E. E., Anderson, L. B., & Wolvin, A. D. (2017). Understanding instructor immediacy, credibility, and facework strategies through a qualitative analysis of written instructor feedback. *Qualitative Research Reports in Communication*, *18*(1), 27-35.

Gargano, T., & Throop, J. (2017). Logging on: Using online learning to support the

academic nomad. *Journal of International Students*, *7*(3), 918-924. doi:

http://dx.doi.org.proxy01.nwacc.edu:2048/10.5281/zenodo.570041

Gerhardt, M. W. (2016). The importance of being … social? Instructor credibility and the

Millennials. *Studies In Higher Education*, *41*(9), 1533-1547.

doi:10.1080/03075079.2014.981516

Ghassemi, A. E. (2016). Innovation in a mental health course design: Increasing student

engagement and interaction. *Journal of The New York State Nurses*

Association, *44*(2), 20-27.

Gilchrist-Petty, E. S. (2017). Unraveling complexities in the teacher-student relationship:

Perceptions of immediacy, credibility, and learning. *Carolinas Communication*

Annual, *45*.

Goga, M., Kuyoro, S., & Goga, N. (2015). A recommender for improving the student

academic performance. *Procedia-Social and Behavioral Sciences*, *180*, 1481-

1488.

Goldman, Z. W., Goodboy, A. K., & Bolkan, S. (2016). A meta-analytical review of

students' out-of-class communication and learning effects. *Communication*

Quarterly, *64*(4), 476-493. doi:10.1080/01463373.2015.1103293.

Goodman, J. S., Orange, A., & Schumacher, G. (2017). Charter school teacher attitudes,

belief systems, and behaviors associated with substantive student academic

achievement. *The Charter Schools Research Journal*, *35*.

Greefrath, G., Koepf, W., & Neugebauer, C. (2017). Is there a link between preparatory course attendance and academic success? A case study of degree programmes in electrical engineering and computer science. *International Journal of Research in Undergraduate Mathematics Education*, *3*(1), 143-167.

Green, T., Hoffmann, M., Donovan, L., & Phuntsog, N. (2017). Cultural communication characteristics and student connectedness in an online environment: Perceptions and preferences of online graduate students. *Journal of Distance Education (Online)*, *32*(2), 1-29.

Harackiewicz, J. M., & Priniski, S. J. (2018). Improving student outcomes in higher education: The science of targeted intervention. *Annual Review of Psychology*, *69*.

Harrison, R., Hutt, I., Thomas-Varcoe, C., Motteram, G., Else, K., Rawlings, B., & Gemmell, I. (2017). A Cross-Sectional Study to Describe Academics' Confidence, Attitudes, and Experience of Online Distance Learning in Higher Education. *Journal of Educators Online*, *14*(2).

Hashim, H., Chong, D. W., Er, H. M., Deb, P. K., Wong, P. S., Lee, M. S., ... & Baloch, H. Z. (2017). Students' perceptions of live online virtual e-problem based learning (LOVE-PBL) using Google Hangouts. *Education in Medicine Journal*, *9*(4).

Hemers, E. (2017). Attendance and attainment are they linked: A study in the first-year of a bioscience degree. *Innovations in Practice*, *2*(2), 93-103.

Hodge, A. E., & Mellin, E. A. (2010). First-generation college students: The influence of family on college experience. *The Penn State McNair Journal*, *7*, 120-134.

Hoey, R. (2017). Examining the characteristics and content of instructor discussion interaction upon student outcomes in an online course. *Online Learning*, *21*(4).

Ishitani, T. T. (2003). A longitudinal approach to assessing attrition behavior among first-generation students: Time-varying effects of pre-college characteristics. *Research In Higher Education. 44*(4), 433-449.

Jayaratne, K. S. U., & Moore, G. (2017). Perceptions of college students toward online classes: Implications for teaching online. *NACTA Journal*, *61*(4), 304-309.

Jeynes, W. H. (2017). A meta-analysis: The relationship between parental involvement and Latino student outcomes. *Education and Urban Society*, *49*(1), 4-28.

Jo, I., Kim, D., & Yoon, M. (2015). Constructing proxy variables to measure adult learners' time management strategies in LMS. *Educational Technology & Society*, *18*(3), 214-225.

Johnson, C., Hill, L., Lock, J., Altowairiki, N., Ostrowski, C., dos Santos, L. D. R., & Liu, Y. (2017). Using design-based research to develop meaningful online discussions in undergraduate field experience courses. *The International Review of Research in Open and Distributed Learning*, *18*(6).

Johnson, C. M. (2016). Rethinking online discourse: Improving learning through discussions in the online classroom. *Education and Information Technologies*, *21*(6), 1483-1507.

Jones, I. S., & Blankenship, D. (2017). Student perceptions of online courses. *Research In Higher Education Journal*, *32*.

Khan, Z. N (2005). Scholastic achievement of higher secondary students in science stream, *Journal of Social Sciences*, *1*(2), 84-87.

Kahu, E. R. (2013). Framing student engagement in higher education. *Studies in Higher Education*, *38*(5), 758-773.

Kassarnig, V., Bjerre-Nielsen, A., Mones, E., Lehmann, S., & Lassen, D. D. (2017). Class attendance, peer similarity, and academic performance in a large field study. *PLoS ONE*, *12*(11), 1–15.

Kim, Y. K., & Lundberg, C. A. (2016). A structural model of the relationship between student–faculty interaction and cognitive skills development among college students. *Research in Higher Education*, *57*(3), 288-309.

Kitsantas, A., Steen, S., & Huie, F. (2017). The role of self-regulated strategies and goal orientation in predicting achievement of elementary school children. *International Electronic Journal of Elementary Education*, *2*(1), 65-81.

Kreie, J., Johnson, S., & Lebsock, M. (2017). Course design and technology for synchronous interaction in an online course. *Information Systems Education Journal*, *15*(5), 60.

Krentler, K. A., & Willis-Flurry, L. A. (2005). Does technology enhance actual student learning? The case of online discussion boards. *Journal of Education for Business*, July/August, 316-321.

Kuo, Y., & Belland, B. R. (2016). An exploratory study of adult learners' perceptions of online learning: Minority students in continuing education. *Educational Technology, Research and Development*, *64*(4), 661-680.

LaRose, R., & Whitten, P. (2000). Re-thinking instructional immediacy for web courses: A social cognitive exploration. *Communication Education*, *49*, 320-338.

Leach, L. (2016). Enhancing student engagement in one institution. *Journal of Further and Higher Education*, *40*(1), 23-47.

Lee, S. A. (2018). Family structure effects on student outcomes. In *Parents, Their Children, and Schools* (pp. 43-76). Routledge.

LeFebvre, L., & Allen, M. (2014). Teacher immediacy and student learning: An examination of lecture/laboratory and self-contained course sections. *Journal of the Scholarship of Teaching and Learning*, *14*(2), 29-45.

Lei, H., Cui, Y., & Zhou, W. (2018). Relationships between student engagement and academic achievement: A meta-analysis. *Social Behavior and Personality: An International Journal*, *46*(3), 517-528.

Levshankova, C., Hirons, D., Kirton, J. A., Knighting, K., & Jinks, A. M. (2018). Student nurse non-attendance in relation to academic performance and progression. *Nurse Education Today*, *60*, 151-156.

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2006). *Methods in educational research: From theory to practice.* San Francisco: Jossey-Bass.

Louis, W. R., Bastian, B., McKimmie, B., & Lee, A. J. (2016). Teaching psychology in Australia: Does class attendance matter for performance? *Australian Journal of Psychology*, *68*(1), 47-51.

Lowenthal, P. R., Snelson, C., & Dunlap, J. C. (2017). Live synchronous web meetings in asynchronous online courses: Reconceptualizing virtual office hours. *Online Learning*, *21*(4), 177-194.

Madland, C., & Richards, G. (2016). Enhancing student-student online interaction: Exploring the study buddy peer review activity. *International Review Of Research In Open And Distributed Learning*, *17*(3), 157-175.

Mancini, T. J. (2017). First-day attendance and student course success: Does being there make a difference? - A literature review. *The Community College Enterprise*, *23*(2), 32-57.

Mazer, J. P., & Stowe, S. A. (2016). Can teacher immediacy reduce the impact of verbal aggressiveness? Examining effects on student outcomes and perceptions of teacher credibility. *Western Journal of Communication*, *80*(1), 21-37. doi: 10.1080/10570314.2014.943421

McMillan, J. H., & Schumacher, S. (2006). *Research in education: Evidence-based inquiry* (6th ed.). Boston: Pearson.

Mehrabian, A. (1967). Orientation behaviors and nonverbal attitude communication. *Journal of Communication*, *17*, 324 – 332.

Mehrabian, A. (1971). *Silent messages*. Belmont, CA.: Wadsworth.

Moke, C., & Wright, L. (2017). Technology that improves instructor presence in online courses. *Online Learning Consortium*.

Moon-Heum Cho, & Scott, T. (2016). Should instructors require discussion in online courses? Effects of online discussion on community of inquiry, learner time, satisfaction, and achievement. *International Review of Research in Open and Distance Learning*, *17*(2).

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education*, *3*(2), 1-6.

Munkaila, A., & Iddrisu, A. (2015). The impact of social network sites on the academic performance of students in the polytechnics of Ghana. *International Journal of Economics, Commerce and Management*, United Kingdom, *3*(11), 1021-1035.

Murphy, C. A., & Stewart, J. C. (2017). On-campus students taking online courses: Factors associated with unsuccessful course completion. *The Internet and Higher Education*, *34*, 1-9.

Nandi, D., Hamilton, M., Harland, J., & Mahmood, S. (2015). Investigation of participation and quality of online interaction. *International Journal of Modern Education and Computer Science*, *7*(8), 25-37.

National Survey of Student Engagement. (2018). *About NSSE*. Retrieved from http://nsse.indiana.edu/html/about.cfm

Navarro Jover, J. M., & Martínez Ramírez, J. A. (2018). Academic performance, class attendance and seating location of university students in practical lecture. *Journal of Technology and Science Education*, *8*(4), 337–345.

Ng, K. (2018). Implementation of new communication tools to an online chemistry course. *Journal of Educators Online*, *15*(1).

Nguyen, T. (2015). The effectiveness of online learning: Beyond no significant difference and future horizons. *MERLOT Journal of Online Learning and Teaching*, *11*(2), 309-319.

Nguyen, T. D., Cannata, M., & Miller, J. (2018). Understanding student behavioral engagement: Importance of student interaction with peers and teachers. *The Journal of Educational Research*, *111*(2), 163-174.

Nicklen, P., Keating, J. L., Paynter, S., Storr, M., & Maloney, S. (2016). Remote-online case-based learning: A comparison of remote-online and face-to-face, case-based learning-a randomized controlled trial. *Education for Health*, *29*(3), 195.

Oh, Y., & Lee, S. M. (2016). The effects of online interactions on the relationship between learning-related anxiety and intention to persist among E-learning students with visual impairment. *International Review of Research in Open and Distance Learning*, *17*(6).

Park, S. (2017). Analysis of time-on-task, behavior experiences, and performance in two online courses with different authentic learning tasks. *The International Review of Research in Open and Distributed Learning*, *18*(2).

Patrick, M. E., Schulenberg, J. E., & O'Malley, P. M. (2016). High school substance use as a predictor of college attendance, completion, and dropout: A national multicohort longitudinal study. *Youth & Society*, *48*(3), 425-447.

Peterson, E. R., Rubie-Davies, C., Osborne, D., & Sibley, C. (2016). Teachers' explicit expectations and implicit prejudiced attitudes to educational achievement: Relations with student achievement and the ethnic achievement gap. *Learning and Instruction*, *42*, 123-140.

Phirangee, K. (2016). Students' perceptions of learner-learner interactions that weaken a sense of community in an online learning environment. *Online Learning*, *20*(4), 13-33.

Pollak, M., & Parnell, D. A. (2018). An interdisciplinary analysis of course meeting frequency, attendance and performance. *Journal of the Scholarship of Teaching and Learning*, *18*(3), 132–152.

Prabhakar, S., & Zaiane, O. R. (2017). Learning group formation for massive open online courses (MOOCs). *International Association For Development Of The Information Society*, *5*.

Purarjomandlangrudi, A., Chen, D., & Nguyen, A. (2016). Investigating the drivers of student interaction and engagement in online courses: A study of state-of-the-art. *Informatics in Education*, *15*(2), 269.

Raspopovic, M., Cvetanovic, S., Medan, I., & Ljubojevic, D. (2017). The effects of integrating social learning environment with online learning. *International Review of Research in Open and Distance Learning*, *18*(1).

Rennar-Potacco, D., Orellana, A., & Salazar, A. (2017). Innovations in academic support: Factors influencing student adoption of synchronous videoconferencing for online support in high-risk STEM courses. *Quarterly Review of Distance Education*, *18*(3), 1-92.

Rockinson-Szapkiw, A., Wendt, J., Wighting, M. & Nisbet, D. (2016). The predictive relationship among the community of inquiry framework, perceived learning and online, and graduate students' course grades in online synchronous and asynchronous courses. *The International Review of Research in Open and Distributed Learning*, *17*(3).

Rocque, M., Jennings, W. G., Piquero, A. R., Ozkan, T., & Farrington, D. P. (2017). The importance of school attendance: Findings from the Cambridge study in delinquent development on the life-course effects of truancy. *Crime & Delinquency*, *63*(5), 592-612.

Roorda, D. L., Jak, S., Zee, M., Oort, F. J., & Koomen, H. M. (2017). Affective teacher–student relationships and students' engagement and achievement: A meta-analytic update and test of the mediating role of engagement. *School Psychology Review*, *46*(3), 239-261.

Schindler, L. A., Burkholder, G. J., Morad, O. A., & Marsh, C. (2017). Computer-based technology and student engagement: A critical review of the literature. *International Journal of Educational Technology in Higher Education*, *14*, 1-28.

Schneider, M., & Preckel, F. (2017). Variables associated with achievement in higher education: A systematic review of meta-analyses. *Psychological Bulletin*, *143*(6), 565.

Shuck, E. (2016). *Education in 2025: Education technology innovation survey*. Polycom, Inc.: San Jose, CA. Retrieved from http://info.hbcommunications.com/hubfs/content/2025-education-in-polycom-survey-enus.pdf?t=1493668027067.

Simpson, O. (2006). Predicting student success in open and distance learning. *Open Learning*, *21*(2), 125-138.

Sinatra, G. M., Heddy, B. C., & Lombardi, D. (2015). The challenges of defining and measuring student engagement in science. *Educational Psychologist*, *50*, 1-13.

Stack, S. (2015). Learning outcomes in an online vs. traditional course. *International Journal for The Scholarship of Teaching and Learning*, *9*(1).

Success Planner Attendance Tracking Faculty Guide. (2016, August 18). Retrieved from https://content.nwacc.edu/distanceLearning/faculty/docs/Success Planner Attendance Tracking Guide.pdf

Suresh, A., Rao, H. S., & Hegde, V. (2017). Academic dashboard—Prediction of institutional student dropout numbers using a naïve Bayesian algorithm. In *Computing and Network Sustainability* (pp. 73-82). Springer, Singapore.

Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education*, *15*.

Sutherland, R., Robertson, S., & John, P. (2004). Interactive education: Teaching and learning in the information age. *Journal of Computer Assisted Learning*, *20*(6), 410-412.

Vandamme, J. P., N. Meskens and J. F. Superby, (2007). Predicting academic performance by data mining methods. *Education Economics*, *15*, 405-419.

Wang, V. X. (2017). *Theory and practice of adult and higher education*. Charlotte, NC: Information Age Publishing.

Ward, M. E., Peters, G., & Shelley, K. (2010). Student and faculty perceptions of the quality of online learning experiences. *International Review of Research In Open And Distance Learning*, *11*(3), 57-77.

Westerman, J. W., Whitaker, B. G., Bergman, J. Z., Bergman, S. M., & Daly, J. P. (2016). Faculty narcissism and student outcomes in business higher education: A student-faculty fit analysis. *The International Journal of Management Education*, *14*(2), 63-73.

White, P. J., Naidu, S., Yuriev, E., Short, J. L., McLaughlin, J. E., & Larson, I. C. (2017). Student engagement with a flipped classroom teaching design affects pharmacology examination performance in a manner dependent on question type. *American Journal of Pharmaceutical Education*, *81*(9), 5931.

Wiggins, B. L., Eddy, S. L., Wener-Fligner, L., Freisem, K., Grunspan, D. Z., Theobald, E. J., & Crowe, A. J. (2017). ASPECT: A survey to assess student perspective of engagement in an active-learning classroom. *CBE - Life Sciences Education*, *16*(2).

Wilson, D., & Allen, D. (2011). Success rates of online versus traditional college students. *Research in Higher Education Journal*, *14*.

Wise, S. L., & Smith, L. F. (2016). The validity of assessment when students don't give good effort. *Handbook of Human and Social Conditions in Assessment*, 204-220.

Witkowski, P., & Cornell, T. (2015). An investigation into student engagement in higher education classrooms. *InSight: A Journal of Scholarly Teaching*, *10*, 56-67.

Witton, G. (2017). The value of capture: Taking an alternative approach to using lecture capture technologies for increased impact on student learning and engagement. *British Journal of Educational Technology*, *48*(4), 1010-1019.

Woods, R. H., & Baker, J. D. (2004). Interaction and immediacy in online learning. *The International Review of Research in Open and Distributed Learning*, *5*(2).

Wubbels, T., Brekelmans, M., Mainhard, T., den Brok, P., & van Tartwijk, J. (2016). Teacher-student relationships and student achievement. *Handbook of Social Influences in School Contexts: Social-emotional, Motivation, and Cognitive Outcomes*, 127-145.

Yorke, M. (2016). The development and initial use of a survey of student 'belongingness', engagement and self-confidence in UK higher education. *Assessment & Evaluation in Higher Education*, *41*(1), 154-166. doi:10.1080/02602938.2014.990415

Young, S., Uy, A., & Bell, J. (2017). Student engagement in research, scholarship, and

    creative activity (SERSCA) program: Sharing a program model from design and

    development through evaluation. *Innovative Higher Education*, *42*(1), 65-76.

Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action.

    Active Learning in Higher Education, *11*(3), 167-177.

Vita

Shane Carroll May has a Bachelor of Science in Computer Science from the University of Houston along and two Masters Degrees: a Master of Arts in Mathematics and Computer Science and a Master of Science in Computer Information Systems, both from the University of Houston. Mr. May started his professional career at the Goliad Independent School District as a Technology Coordinator. Later, Mr. May accepted a position at the University of Houston as Project Manager and Software Engineer. Mr. May's next position was with Ozarks Technical Community College as a Systems Engineer and Analyst. During that time, Mr. May begin teaching as an adjunct professor. He taught programming and web development courses.

In 2013, Mr. May became a full-time faculty member of Northwest Arkansas Community College. Currently, Mr. May holds the rank of Associate Professor of Computer Science and Mathematics. He resides in Bentonville, Arkansas, with his wife and two daughters.