

**Impacts of Levels of Attendance on Academic Success of Students in a  
Doctor of Chiropractic Degree Program**

David W. Foose Jr.

B.S., University of Central Missouri, 1994

M.A., University of Missouri- Kansas City, 2000

Submitted to the Graduate Department and Faculty of the School of Education of  
Baker University in partial fulfillment of the requirements for the degree of  
Doctor of Education in Leadership in Higher Education

*Tes Mehring*

---

Tes Mehring, Ph.D.  
Major Advisor

*Tracy Cooper*

---

Tracy Cooper, Ph.D.

*Dale Marrant*

---

Dale Marrant, Ed.D.

Date Defended: May 1, 2024

Copyright 2024 by David W. Foose Jr.

## **Abstract**

Several researchers have reported that class attendance is necessary for students to be academically successful and that students who attend class more frequently are more academically successful in their courses (Brocato, 1989; Buckalew, Daly, & Coffield, 1986; Chan, Shum, & Wright, 1997; Chenneville & Jordan, 2008; Cohn & Johnson, 2006; Dey, 2018; Gatherer & Manning, 1998; Golding, 2011; Gunn, 1993; Snell & Mekies, 1995; Verbeeten, 2004). However, most of the research related to attendance and academic success has been conducted with undergraduate coursework rather than graduate level healthcare education programs. This study investigated the impacts that levels of attendance have on student success in lecture, lab, and clinical coursework in the Doctor of Chiropractic (DC) program at Cleveland University-Kansas City (CUKC). The study examined cumulative attendance rates for students who completed the DC program within six years or 150% of the program standard completion timeline. The study used a causal-comparative research design to measure the effects of levels of attendance on the academic success of 341 students whose anticipated graduation within 150% of the expected program completion date occurred during the 2017-2020 academic years (Fall 2017-Summer 2020). Using archival data, the student data were sorted into three groups: those whose cumulative attendance was 95% or higher, 90% to 94.9%, and less than 90%. The benchmarks for academic success were persistence to graduation within 150% of standard completion time after matriculation into the DC degree program, cumulative grade point average (GPA) at the time of graduation for those students who graduated within 150% of standard completion time, and passage of the National Board of Chiropractic Examiners (NBCE) Parts I, II, III, and IV board exams within 6 months

after their graduation date for those students who graduated within 150% of standard completion time. Students who attended at higher levels were found to have achieved a higher rate of graduation within 150% of standard completion time and achieved a higher cumulative GPA at graduation. Analyses of NBCE exam passage could not be completed due to the high exam pass rate of students in the DC program at CUKC. Future research should be conducted with other DC degree programs whose NBCE exam pass rates may be lower and may provide significant results regarding the impacts of attendance on successful exam passage.

## **Dedication**

This study is dedicated to my wife Heather, who has been my constant supporter through all of my journeys and trials during the past 28 years and shares my compassion for students as an educator herself; to my children Quinn and Sophie who continue to seek learning opportunities and are never afraid to follow new paths; and to my grandson Leo who left us way too soon, but taught us a great deal in 11 months.

## **Acknowledgements**

In 1995 I began my journey into higher education when I met Marilyn Donatello, Dean of Student Services at Maple Woods Community College. Dean Donatello saw something in me that I had not yet seen in myself, and her wise counsel resulted in me becoming an academic advisor and completing my master's degree in higher education administration. Fast forward twenty years, and I found myself entering the role of Dean of Student Affairs at Cleveland University-Kansas City, a role very similar to the one Dean Donatello held. In this role, my new mentor, Dr. Gery Hochanadel urged me to pursue my doctoral degree, and I thank him for his encouragement as I started the program at Baker University.

I am thankful for Dr. Tes Mehring, who has been my major advisor through the portfolio and dissertation phases of my education. Without her patient and persistent prodding, I may not have made it through to completion of the program. In addition to her guidance in the post-coursework phase of my program, I learned a great deal from Dr. Mehring as my course instructor in the first and last courses of the program. I believe I was profoundly changed by the material presented in those courses and feel that my level of compassion for and understanding of others has grown immensely because of it.

I am also appreciative of the other members of my dissertation committee, Drs. Peg Waterman, Tracy Cooper, and Dale Marrant. Dr. Waterman, you were so patient as we worked out the fine details of my research analysis, and when I needed your help when conducting the analysis "on my own". Dr. Cooper, I appreciate the guidance you provided through reading and providing suggestions for edits of my dissertation chapters. Dr. Marrant, my thanks for your motivation and words of advice as I went through the

program. Your insight as a colleague and previous student in the program was so appreciated.

Finally, I am indebted to my colleagues and family members who have made a significant impact on the direction my life has taken. To my colleagues from MCC-Maple Woods and CUKC, I thank you for everything I have learned from you about how to effectively serve students. To my mentors and supervisors, thank you for always challenging me to experience new things and for the opportunities you have given me that have resulted in an expansion of my knowledge and career. To my mom, thank you for supporting my pursuit of further education even though you were never able to pursue higher education for yourself. You frequently asking, “How’s your dissertation going?” was a great motivator for me to stay on track.

## Table of Contents

Abstract .....	ii
Dedication .....	iv
Acknowledgements .....	v
Table of Contents .....	vii
List of Tables .....	x
Chapter 1: Introduction .....	1
Background .....	2
Statement of the Problem .....	5
Purpose of the Study .....	7
Significance of the Study .....	8
Delimitations .....	8
Assumptions .....	9
Research Questions .....	10
Definition of Terms .....	10
Organization of the Study .....	12
Chapter 2: Review of the Literature .....	13
Measurement and Definitions of Academic Success .....	13
Research Related to Pros and Cons of Mandatory Attendance Policies .....	16
Pro mandatory attendance policy research .....	16
Con mandatory attendance policy research .....	19

Research Related to Positive Rewards for Attendance or Penalties for	
Non-attendance .....	21
Summary .....	26
Chapter 3: Methods.....	27
Research Design.....	27
Selection of Participants .....	28
Measurement.....	28
Data Collection Procedures.....	29
Data Analysis and Hypothesis Testing .....	29
Limitations .....	32
Summary .....	33
Chapter 4: Results.....	34
Descriptive Statistics.....	34
Hypothesis Testing.....	35
Summary .....	43
Chapter 5: Interpretation and Recommendations .....	44
Study Summary.....	44
Overview of the problem .....	44
Purpose statement and research questions .....	45
Review of the methodology .....	45
Major findings.....	46
Findings Related to the Literature.....	47



Conclusions.....	48
Implications for action .....	48
Recommendations for future research .....	49
Concluding remarks .....	50
References.....	51
Appendices.....	58
Appendix A. Baker University IRB Approval.....	59
Appendix B. Cleveland University – Kansas City IRB Approval.....	61

## **List of Tables**

Table 1. Descriptive Statistics for Level of Cumulative Program Attendance.....	35
Table 2. Observed and Expected Frequencies for H1.....	37
Table 3. Descriptive Statistics for the Results of the Test for H2.....	38
Table 4. Observed and Expected Frequencies for H3.....	39
Table 5. Observed and Expected Frequencies for H4.....	40
Table 6. Observed and Expected Frequencies for H5.....	41
Table 7. Observed and Expected Frequencies for H6.....	42

## **Chapter 1**

### **Introduction**

Higher education has long been thought of as a service for the greater good of society (Zumeta, Breneman, Callan, & Finney, 2012). According to Murray (2009), individuals who participate in higher education have been shown to exhibit characteristics that are related to good citizenship at a higher level than those who do not participate in higher education. However, Lochner (2011) posited that optimum societal benefits are not realized unless students participate in higher education activities in ways that help them to successfully master the course material and gain the academic knowledge needed to understand what it means to be a good citizen.

There are many factors that influence the academic success of college students. Sykes (2016) cited the increasing costs of attendance and increased loan debt as two of those factors. Doggrell (2021) suggested that “previous academic performance at the university level, psychosocial factors such as commitment and satisfaction with the university, cognitive ability, and demographics” (p. 651) are major predictors of academic success. One of the factors that faculty and administrators have attributed to having a positive impact on student success is mandatory attendance (St. Clair, 1999). According to Verbeeten (2004), faculty often feel that mandatory attendance is necessary for students to be successful. However, Verbeeten offered that most college students feel that they are adults and should be able to determine how often they need to attend classes. Despite the divergence of opinions regarding the impact of mandatory attendance, researchers have indicated that there is a positive correlation between attendance and course grades (Golding, 2011; Verbeeten, 2004).

It is generally accepted that some level of class attendance is necessary for students to be exposed to the course concepts and material at a level that will result in meaningful learning and student success (Brocato, 1989; Buckalew, Daly, & Coffield, 1986; Chan, Shum, & Wright, 1997; Chenneville & Jordan, 2008; Cohn & Johnson, 2006; Dey, 2018; Gatherer & Manning, 1998; Golding, 2011; Gunn, 1993; Snell & Mekies, 1995; Verbeeten, 2004). However, the level of attendance necessary for student success is defined very differently from institution to institution and from academic program to academic program. Despite a general agreement that higher levels of attendance result in greater academic success, there is disagreement as to the effectiveness of mandatory attendance policies. In various studies (Brocato, 1989; Buckalew et al., 1986; Chan et al., 1997; Cohn & Johnson, 2006; Gatherer & Manning, 1998; Gunn, 1993; Kassarnig, Bjerre-Nielsen, Mones, Lehmann, & Dreyer Lassen, 2017; Zhu, Huang, Defazio, & Hook, 2019), researchers have provided evidence in support of mandatory attendance. However, St. Clair (1999) presented evidence that mandatory attendance policies are viewed negatively by adult students who believe they should be able to make their own decisions regarding how often to attend classes. According to St. Clair, these negative feelings may actually lead students to attend class less frequently and may eventually have a negative impact on institution due to students leaving.

## **Background**

Chiropractic is a profession that requires hands-on treatment of patients to align their spine and relieve nerve dysfunction which optimizes the patient's health, allowing the body to heal itself (Redwood & Cleveland, 2003). The DC program at CUKC includes 4,575 clock hours of lecture, laboratory, and clinical coursework that is taken

over the course of 48 months. The curriculum is divided into 2,850 clock hours of lecture coursework, 750 clock hours of laboratory coursework, and 975 clock hours of clinical coursework. The program is delivered in a trimester format, and the standard completion time is 12 trimesters. The first four trimesters consist primarily of basic science coursework such as biochemistry, anatomy, physiology, and microbiology. These subjects are covered on the National Board of Chiropractic Examiners (NBCE) Part I exam. Trimesters five through 12 primarily cover chiropractic technique, clinical skills acquisition, and various other concepts that are required to be a competent chiropractic practitioner. These subjects are covered on the NBCE Part II, III, and IV exams. While the NBCE does not have an attendance requirement for students to take their exams, students must pass all of these exams in order to be licensed as a DC in the United States, and the educational institutions are required to report the percentage of students who have passed all four of the exams within 6 months of graduation. Institutions whose board pass rate drops below 80% are subject to actions by the Council on Chiropractic Education (CCE), which is the accrediting body for Doctor of Chiropractic programs in the United States (CCE, 2022). Student passage of NBCE exams is vital for professional licensure, so institutions must ensure that students are prepared for success.

As a hands-on health occupation, it is important that students attend in-person classes, labs, and clinical activities to practice their chiropractic technique (CCE, 2022). Because of the nature of the profession, CUKC has and enforces a mandatory attendance policy that could be considered strict compared to some other institutions in the United States that offer DC degree programs. Currently, students at CUKC are allowed to miss a maximum of 15% of the instructional clock hours in any given course. If the student

exceeds the 15% allowance, they are assigned a grade of XF, which denotes a status of failure for lack of attendance. However, the current policy was somewhat relaxed compared to the previous policy as a result of a policy review and approved policy change that occurred in 2016.

Prior to the 2016 policy change, students were allowed to miss a maximum of 10% of the instructional clock hours for each course. Exceeding that allowance resulted in the assignment of an XF grade. The 10% absence policy was originally based on a California Board of Chiropractic policy stating that individuals applying for licensure must have been in attendance for a minimum of 90% of the scheduled time for their chiropractic degree program (CUKC, 2015).

Until October of 2011, CUKC (named Cleveland Chiropractic College at that time) operated a campus in Los Angeles, California and a campus in Kansas City, Missouri. Because of the location of the Los Angeles campus, and because it was touted that all Cleveland graduates were eligible to practice chiropractic in all 50 states, the attendance policy allowing a maximum of 10% absence was adopted for both campuses. When the reasoning for the attendance policy was questioned, the standard response was that CUKC wanted its chiropractic program graduates to be qualified to practice in all 50 states upon graduation.

Over the years, many students complained about the strictness of the attendance policy. They indicated that, as adults, they should be able to determine how frequently they needed to attend class in order to be successful. After individual complaints did not result in any change, the CUKC Student Council submitted a petition to the administration to consider changing the attendance policy. It was agreed that a group

consisting of students, faculty, staff, and administrators would conduct a review of the attendance policy and determine whether it was appropriate to propose changes.

As a result of the work completed by that group, while the importance of mandatory attendance was agreed upon, it was determined that some concession to the 10% allowance may be appropriate. A proposal was presented to the CUKC Executive Council that resulted in a change in the absence allowance from 10% to 15%. All other aspects of the attendance policy remained the same. In order to address the California licensure requirement, it was proposed that a statement be added to notify students that some states may have a stricter attendance requirement for licensure and that it was the student's responsibility to know the requirements of the state(s) in which they may be planning to practice. The proposal was approved by the CUKC Executive Council and the policy change was effective for the fall 2016 term (CUKC, 2016).

### **Statement of the Problem**

A majority of researchers who have investigated mandatory college course attendance policies (Brocato, 1989; Buckalew et al., 1986; Chan et al., 1997; Chenneville & Jordan, 2008; Cohn & Johnson, 2006; Gatherer & Manning, 1998; Golding, 2011; Gunn, 1993; Kassarnig et al., 2017; Snell & Mekies, 1995; Verbeeten, 2004; Zhu et al., 2019) have supported the idea of mandatory attendance policies as a positive influence on student academic success. Contrary to the findings of these authors, St. Clair (1999), Hyde and Flournoy (1986) and Macfarlane (2013) indicated that attendance policies do not directly impact student success and that the negative feelings toward required attendance can negatively impact a student's success. Additionally, these authors

suggested that students' negative feelings can have an impact on higher education institutions resulting in decreased enrollment and financial impacts to the institution.

Despite the amount of research related to attendance policies and student success, the majority of research has focused on courses that are lecture-based (Chan, Shum, & Wright, 1997; Cohn & Johnson, 2006; Gatherer & Manning, 1998; Gunn, 1993). However, many graduate level healthcare programs, such as Doctor of Medicine programs and DC programs, include significant hands-on laboratory and clinical instruction. While the impacts of attendance related to performance in individual courses has been widely researched, there is limited research related to how attendance and mandatory attendance policies impact a student's success in program completion and professional preparation. Furthermore, the research that has been conducted has been related to attendance in undergraduate, lecture-based coursework. Research has not focused on graduate coursework, graduate programs, and more specifically, programs that lead to professional licensure in healthcare occupations. Graduate level healthcare programs require more than successful completion of a course or of a degree program. Healthcare occupations also require successful passage of professional examinations and often state licensure exams. Gaining an understanding of the relationship between attendance and success in graduate level healthcare programs and on licensure examinations is necessary for the leaders of those programs to evaluate the adequacy of their attendance policies.

Past research has focused on the impact that attendance policies have had on student success in individual courses. However, there are several factors that need additional investigation. The first is that the term *mandatory attendance* has not been



clearly defined with relation to the level of attendance that is necessary for success. Although many institutions have mandatory attendance policies, the strictness of those policies varies greatly. The DC program at CUKC allows 15% absence in individual courses. Some attendance policies award points for attendance, while others lower grades or involuntarily withdraw students due to lack of attendance. This second, more punitive view, is the view that CUKC, the program examined in this study, applies (CUKC, 2023). Previous research has focused mainly on attendance in lecture-based courses and student success in those individual courses. This research does not adequately address the overall importance of attendance for graduate level healthcare programs. Research that focuses on student success related to attendance in lecture, lab, and clinical coursework is important. The impacts of attendance on lecture, lab, clinical coursework, and performance on professional licensing examinations is the focus of this study.

### **Purpose of the Study**

The purpose of this study was to investigate the impacts that levels of attendance have on student success in lecture, lab, and clinical coursework in the DC program at one higher education institution, CUKC. The study examined cumulative attendance rates for students who completed the DC program within six years or 150% of the program standard completion timeline. Program completion was measured for students whose 150% completion time occurred during the 2017-2020 academic years (Fall 2017-Summer 2020). Three purposes guided this study. The first purpose of the study was to investigate the impact of attendance on persistence to graduation within 150% of standard completion time. The second purpose of the study was to examine the impact of

attendance on cumulative GPA for those students who completed the DC program within 150% of standard completion time. The third purpose of the study was to determine how attendance impacted success in passing the NBCE Part I, Part II, Part III, and Part IV exams, which are required for professional licensure, for those students who completed the DC program within 150% of standard completion time.

### **Significance of the Study**

This study examined the impacts of various levels of program attendance related to student success in a DC degree program, which consists not only of lecture courses, but also significant hours of lab and clinical coursework. This research study added to the current body of knowledge and provided guidance related to the impact that program attendance has on student success in DC degree programs. These findings could be of benefit to the administrators and faculty at the 18 institutions in the United States that offer DC programs. The results of the study may be of interest to administrators and faculty who determine attendance policies in other college level degree programs as well. Specifically, findings related to this research could benefit administrators who determine the policies of their institution, faculty who are responsible for enforcing the institution's attendance policy, and students who may question the need for regular in-person attendance or for a specific attendance policy in general. Additionally, findings may inform state boards of chiropractic whose bylaws mandate that students must have attended at a specific level in order to be eligible for licensure.

## **Delimitations**

Lunenberg and Irby (2008) defined delimitations as “self-imposed boundaries” (p. 134) intended to place limits on research. There were three delimitations placed on this study:

- 1) The study was limited to students in one DC program (CUKC) out of a total of 18 programs located in the United States (Council on Chiropractic Education, 2023).
- 2) Study participants were limited to those who were part of a cohort group who graduated during the fall of 2017 through summer 2020 within a 150% program completion rate standard.
- 3) While there are several methods to determine academic success, in this study academic success was based on persistence to program completion using a 150% program completion rate standard, cumulative GPA at program completion, and passage of Parts I, II, III and IV of the NBCE exams.

## **Assumptions**

Assumptions are “postulates, premises, and propositions that are accepted as operational for the purpose of the research” (Lunenberg & Irby, 2008, p. 134). In this study there were four assumptions:

- 1) All students had been accepted to the DC program utilizing admissions standards that adhered to CCE requirements.
- 2) All students participated in curriculum that adhered to the curricular standards of the CCE.

- 3) All faculty who taught in the program enforced the institution's stated attendance policy.
- 4) The student information system database was regularly maintained, and that the information contained in it was accurate.

### **Research Questions**

**RQ1.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on persistence to graduation within 150% of standard program completion time (six years) for DC students at CUKC?

**RQ2.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on cumulative GPA at program completion for DC students who graduate within 150% of standard completion time at CUKC?

**RQ3.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part I exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

**RQ4.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part II exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

**RQ5.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part III exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

**RQ6.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part IV exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

### **Definition of Terms**

**Lecture coursework.** According to the Cleveland University-Kansas City catalog (2023), lecture coursework is defined as coursework where the mode of instruction consists of an instructor or lecturer giving a formal prepared talk or presentation to a group of students. Lecture courses may consist of only lecture, or may include a combination of lecture, laboratory, and/or clinical.

**Laboratory coursework.** According to the CUKC catalog (2023), laboratory coursework is defined as coursework where the mode of instruction consists of hands-on activities intended to reinforce a student's science or chiropractic treatment skills. Courses may consist of only laboratory, or may be a combination of laboratory, lecture, and/or clinical.

**Clinical coursework.** According to the CUKC catalog (2023), clinical coursework is defined as coursework where students treat patients utilizing the chiropractic skills that they have learned. Courses may consist of clinical only, or may be a combination of clinical, lecture, and/or laboratory.

**NBCE exams.** The NBCE (n.d.-a) described the NBCE exams as the professional exams that DC students must successfully complete in order to be eligible for licensure as a chiropractor in the United States after they have graduated from a DC degree program accredited by the CCE. The exams consist of four individual exams, Part I, Part II, Part III, and Part IV. The Part I exam is a computer-based exam that covers

basic science concepts in the areas of general anatomy, spinal anatomy, physiology, chemistry, pathology, and microbiology (NBCE, n.d.-b). The Part II exam is a computer-based exam that covers clinical science concepts in the areas of general diagnosis, neuromusculoskeletal diagnosis, diagnostic imaging, principles of chiropractic, chiropractic practice, and associated clinical sciences (NBCE, n.d.-c). The Part III exam is a computer-based exam that covers chiropractic practice concepts in the areas of case history, physical and neuromusculoskeletal examination, clinical diagnosis, chiropractic techniques, and case management (NBCE, n.d.-d). The Part IV exam is a hands-on, practical exam that covers chiropractic technique and case management in more depth utilizing actual patients in a station-based format (NBCE, n.d.-e)

### **Organization of the Study**

This study is organized in five chapters. Chapter 1 provided the introduction, background of the topic, statement of the problem, purpose of the study, significance of the study, delimitations, assumptions, research questions, and definition of terms. Chapter 2 provides a review of the literature that explores the measurement and definitions of academic success, pros and cons of mandatory attendance policies, and research related to positive rewards for attendance vs. penalties for non-attendance. Chapter 3 explains the research methods of the study including the research design, selection of participants, measurement, data collection procedures, data analysis and hypothesis testing, and limitations of the study. Chapter 4 presents descriptive statistics and the results of the hypothesis testing. Chapter 5 provides the interpretation and recommendations of the study including the study summary, findings related to the literature, and conclusions.

## Chapter 2

### Review of the Literature

This study examined the level of student success related to the rate of class attendance for students in a DC degree program at CUKC. The review of the literature addresses three topics related to the current study. The first section explores definitions of academic success and how it is measured. The second section examines research related to the pros and cons of mandatory class attendance policies. The third section summarizes research on positive rewards vs. penalties for non-attendance.

#### Measurement and Definitions of Academic Success

The meaning of *academic success* can vary greatly depending on the source. Several researchers (Garcia y Garcia, 2021; Guterman, 2020; Lebedina-Manzoni, 2004) have studied the concept of academic success from the viewpoint of students. Their results were very different when compared to the concept of academic success from the viewpoint of faculty and academic researchers (Sibanda, Iwu, & Benedict, 2015; York, Gibson, & Rankin, 2015).

Garcia y Garcia (2021) conducted a survey of 165 students from three different institutions who were in various academic programs. The survey asked participants to respond to eight variables. Four were internal, and four were external. The internal variables were *calm*, *effort*, *attention*, and *intelligence*. The four external variables were *liking their teachers*, *easy tasks*, *good teachers*, and *luck*. While the respondents indicated that all eight factors contributed to their academic success, the top three reasons were *intelligence*, *effort*, and *good teachers*. Some variation was found between the responses of males and females. Although both genders ranked intelligence as the most

important variable, males ranked *calm* as the second variable, while females ranked *calm* as variable number seven. Females ranked *effort* as the second most important variable, while males ranked *effort* as variable number four. Despite the slight difference in the opinions of males and females, both genders agreed that the top two variables related to academic success were internal variables.

Guterman (2020) examined the shortcomings of using grades to measure academic success related to the goals and expectations of students. According to Guterman, there can be discrepancies between what students define as academic success and the definitions of faculty. While faculty valued striving for perfect grades, some students were content with simply passing their courses. For instance, one student stated that “Any grade over 60 [out of a total of 100] indicates that I have wasted time on studying unnecessarily” (p. 405). Guterman suggested a model for academic success based on a combination of three factors: external criteria which are criteria defined by the educator; normative criteria which are based on a student’s achievements compared to their peers; and self-reference which are based on goals as defined by the individual student. While this model was not intended to replace current grading models, Guterman posited that it may provide a frame of reference related to academic success that will lessen the stigma that students who do not achieve A or B grades may feel and that it may also lead to fewer students dropping out of college.

Sibanda et al. (2015) studied perceptions of 94 students about factors that influence student success. In the survey, students were asked to use a scale of one to four to respond to questions related to 39 factors that influence academic success and 41 factors that influence academic failure. A response of *not influential* was given a value of



one, a response of *slightly influential* was given a value of two, a response of *fairly influential* was given a value of three, and a response of *very influential* was given a value of four. According to the researchers, *regular attendance at lecture* was the number two factor that students cited as influencing academic success. Number one was *regular study*. Of the factors cited as influencing academic failure, *lack of attendance at lectures* was ranked number five after *noisy lecturing environment*, *not finishing or doing assignments*, *insufficient effort-studying*, and *lack of communication between student and lecturer*. According to Sibanda et al., the results of their study will help administrators to better understand student needs and will help to create more effective interventions for students who may not be succeeding academically.

York et al. (2015) examined several methods for evaluating academic success. According to York et al., the major methods for evaluating academic success included academic achievement in the form of GPA and grades, career success, satisfaction, persistence, acquisition of skills and competencies, and attainment of learning objectives. Of these methods, York et al. reported that a disproportionately large emphasis was placed on measuring academic success in relation to grades and GPA. The researchers posited that this can be problematic in three ways. First, grades and GPA are not always an accurate measure of cognitive growth and learning. Second, grading can vary from institution to institution and does not provide a consistent comparison across institutions. Third, the lack of generalization that results from this narrow way of examining academic success may actually decrease the level of cohesion between institutions related to their priorities. To address these issues, York et al. presented three implications. First, it was suggested that researchers and practitioners broaden their definition of academic success.

Measurement of skills acquisition and cognitive growth through evaluations separate from grades and GPA, as well as consideration of students' attainment of their own aspirational and educational goals would help to more broadly assess student academic success. Second, it was encouraged that additional research be conducted related to academic achievement of under-served student groups such as low-income students, first-generation students, students with learning disabilities, and veterans. The dynamics of factors that affect these student groups should be considered in light of the ways that they may impact grades and GPA. Third, it was suggested that practitioners utilize the additional methods that were cited in the study, in addition to utilization of grade and GPA measures.

### **Research Related to Pros and Cons of Mandatory Attendance Policies**

Many researchers have conducted studies related to the value of class attendance and its impact on academic success. Most of the research has focused on undergraduate courses. While some studies have focused on science courses, most of the research has focused on general education and non-science courses. A limited amount of research has focused on graduate level education, and even less research has focused on graduate level healthcare education courses or programs. This section will focus on general information related to academic success and the role that attendance plays for all types of programs.

**Pro mandatory attendance policy research.** Romer (1993) indicated that, on average, one third of students will be absent each day from any given class. According to Marburger (2006), classes with mandatory attendance policies result in higher rates of attendance indicating that the average absence rate for classes without mandatory

attendance policies is higher than one third. Marburger (2006) reported that these data provided a strong argument for the concept of mandatory attendance.

According to Marburger (2006), Chen and Lin (2008), and Chenneville and Jordan (2008), there is significant support for institutions implementing mandatory attendance policies. Mandatory attendance policies are supported by a majority of administrators and faculty members because they are believed to safeguard the quality of the institution and its educational programs (St. Clair, 1999). In one of the earliest studies looking at the impacts of mandatory attendance policies, St. Clair (1999) stated that faculty and administrators believe if students

do not attend class but are, nonetheless, able to pass courses and obtain degrees, an institution's reputation will suffer. If students do not attend class and failure is prevalent, the future of the institution is again in jeopardy. In both cases, an institution will not attract students, will experience reduced enrollment, and will eventually cease to exist. (p. 171)

According to St. Clair (1999), many higher education personnel believe that mandatory attendance protects the institution and keeps it operationally sound. However, Brocato (1989) indicated there are varied opinions of how much absence is too much. While administrators at some institutions believe that an absence percentage over 50% is the breaking point for students to be successful (Parker University, 2015) other institutions require students in some of their programs, such as the Associate of Applied Science degree in Radiologic Technology at CUKC, to be present as much as 90% of the time (CUKC, 2023) and believe this attendance expectation is necessary to assure the academic success of students.

Researchers (Brocato, 1989; Buckalew et al., 1986; Chan et al., 1997; Chenneville & Jordan, 2008; Cohn & Johnson, 2006; Dey, 2018; Gatherer & Manning, 1998; Golding, 2011; Gunn, 1993; Kassarnig et al., 2017; Snell & Mekies, 1995; Verbeeten, 2004; Zhu et al., 2019) have supported the idea that students who attend class more frequently will be more academically successful in their courses. Chen and Lin (2008) found a statistically significant positive correlation between class attendance and academic success in coursework. Marburger (2006) found that students did not perform well on exam material that was specifically covered on a day that they missed class.

Knight and McKelvie (1986) conducted a study that focused on student behaviors in seven class sections of an introductory psychology course. The researchers examined the impacts of attendance, note-taking, and review of notes and how these variables impacted the students' performance on an exam. Each course section utilized a different combination of participation in lecture attendance, note-taking, and review of notes. Two of the sections did not attend the lecture activity and were simply given lecture notes. The two sections that did not attend the lecture averaged lower scores on the exam than those who attended the lecture.

Nyatanga and Mukorera (2019) found that first year and second year economics students passed their courses at a significantly higher rate as their attendance rate increased. For first year students, those who attended class at a rate of 60% were 4.09 times more likely to pass than those who attended at a rate of less than 60%. Those who attended at a rate of 70% were an additional 2.34 times more likely to pass, and those who attended at a rate of 80% were an additional 3.54 times more likely to pass than those who attended at a rate of 60%.

Chenneville and Jordan (2008) reported that the average student in a course with a stated attendance policy missed one class per semester, while those in classes without a stated attendance policy missed an average of two classes per semester. Marburger (2006) reported that students in a class with a stated attendance policy missed class at an average rate of 12.5%, 10.8%, and 11.2% on the day prior to the three scheduled exams, whereas the students in the same course with no stated attendance policy missed class at a rate of 13.8%, 21.4%, and 27.2% on the same days. By the third exam, students with no stated attendance policy were missing class at more than twice the rate of classes with a stated attendance policy. Zhu et al. (2019) also found that students attended class at a higher level when attendance was mandatory. These researchers reported that the more stringent the attendance policy, the higher the level of student attendance.

**Con mandatory attendance policy research.** Although most researchers have reported a positive correlation between attendance and academic success, some researchers have questioned whether requiring attendance is warranted. Some researchers have suggested that academic success should be achieved out of a desire to learn and that the desire to learn will automatically result in higher levels of student class attendance (Buchele, 2021, St. Clair, 1999). While there is evidence that supports the idea of allowing students to determine the level of class attendance that is right for them, Karnik, Kishore, and Meraj (2020) posited that students attending class out of their own self-interest is “most likely to create willing learners but the problem often is that, at least, a reasonable number of students may be myopic and fail to recognize that their own long-term interest lies in better academic performance” (p. 385).

When looking at the concept of voluntary attendance, it is important to consider the reasons that students do or do not attend classes. According to Rocca (2004), reasons for student absences include “paying for one’s own education, student motivation, doing work for other classes, being tired or sick, weather conditions, using alcohol or drugs, having alternate ways to learn or get notes, and feeling that the class was boring” (p. 186). While some of the reasons for being absent may be out of the student’s control, according to Rocca (2004), most absences result from conscious choices that were made by the student, raising the question of whether adult students should be allowed to make their own decisions regarding attendance or whether the institution should be able to assert their opinions regarding class attendance.

St. Clair (1999) reported that mandatory attendance policies can cause students to feel that they have a lack of control over their environment. According to St. Clair, students’ inability to choose whether or not to attend class may diminish their motivation to learn and engage in the class. While students may attend because they are required to, it may result in lower levels of engagement in class because of feelings that they have a lack of personal control over the situation. Macfarlane (2013) argued against mandatory attendance and suggested that these policies promote the concept of presentism, where students come to class just to be physically present but may not engage in any measurable learning. Feelings of lack of control caused by mandatory attendance policies can result in negative views of higher education leading students to believe college enrollment is not valuable to them, thus putting institutions at financial risk due to the possibility of decreasing enrollments (St. Clair, 1999).

Lamb et al. (2020) conducted a study at one medical school that initially instituted an attendance policy that required students to attend all class activities. Due to a high volume of student complaints about the policy, several new attendance policy iterations were attempted, including one where students were allowed a percentage of absences for various reasons. However, students tended to skip days where high interaction activities were occurring, which negatively impacted their learning of necessary concepts. Eventually, the school's faculty determined that the best way to ensure attendance was to engage students in a way that would actually make them want to attend. They enacted a case-based learning component in the curriculum and changed the attendance policy to one where attendance was 'expected' rather than mandatory. While attendance was no longer required, the attendance rate rose significantly. On end-of-course evaluations, students routinely noted that case-based learning was a major benefit to them and a major reason for attending class regularly (Lamb et al., 2020).

### **Research Related to Positive Rewards for Attendance or Penalties for Non-attendance**

Regardless of how much time an institution believes that students should be present for class, it is widely accepted that there must be motivation for students to attend (Buchele, 2021; Gump, 2004; Moore, 2005; St. Clair, 1999; Zhu et al., 2019). When examining mandatory attendance policies, two specific methods have been utilized to ensure that students attend class. The methods involve the use of positive rewards for attendance vs. penalties for non-attendance.

Some attendance policies utilize graded attendance processes. There are two main grading methods utilized with relation to attendance. In one method, instructors

assign points for participation, often referred to as a participation grade (Chenneville & Jordan, 2008). Participation points are awarded to students who attend class each day and become a positive reward for those who attend class. In the second method, a student's grade may be negatively impacted if they are absent from class more than the stated allowance (Life University, 2023). At some institutions, the consequence for missing too much class time is the assignment of a lower letter grade. For instance, if a student is absent more than the allowed amount of time, the grade of *B* that they earned may be lowered to a grade of *C* due to their attendance. In more extreme cases, students may be withdrawn from the course if they exceed the allowed absence time. In the most extreme cases, a student may receive a failing grade for the course if they exceed the stated absence allowance (CUKC, 2023). This method results in a negative consequence for those who do not adhere to the stated attendance guidelines.

Ching (2012) conducted a mixed methods research study to determine how rewards and penalties may or may not impact a student's behavior and learning. A questionnaire was administered to students in four different schools. In addition, observations and interviews were conducted to gather information measuring student perceptions of the penalties and rewards processes utilized by their school to enforce attendance. Ching (2012) focused on three specific questions: "1) Do rewards motivate students to work hard; 2) Do penalties deter students from behaving badly; 3) What do students prefer for rewards/penalties?" (p. 33). Overall, the researchers found that both penalties and rewards helped increase learning and attendance. However, students expressed a preference for rewards over penalties when given a choice between the two.



Moore (2005) conducted research related to whether penalties or rewards were more effective related to attendance. The study of 684 students was conducted using four sections of an introductory biology course. In two sections, no specific discussion of the importance of attendance occurred, but one of those sections was penalized for absences and the other was not. In the other two sections, a discussion of the importance of attendance did occur, and like the previous two sections, one was penalized for absences and the other was not. In all sections, students who attended class more frequently received higher grades. However, the variation between the groups was minimal and there seemed to be little impact based on the level of emphasis on the importance of attendance or the assigning of penalties for attendance. Interestingly, Moore (2005) noted that 29% of the students in the penalty group who received a grade of F would have passed the course if not for the absence penalty.

Gump (2004) surveyed 220 students in a general education elective Introduction to Japanese Culture course to measure their opinions of what would motivate them to attend class. When responding to pre-determined response options, 34% of the students selected *Instructor would notice absence*, 39.6% selected *Student likes classmates*, 48.6% selected *Students feel obligated to attend*, 66.7% selected *Attendance is required/part of grade*, and 84.7% selected *Instructor/material is interesting*. According to Gump, with the options presented, the top reason for attending class selected by students fell into the *positive rewards* category. The second reason was aligned with the *penalties* category. Although the research findings did not indicate a strong student preference for positive rewards vs. penalties, Gump's findings indicated that mandatory attendance policies may

not be necessary if course material was interesting, and students simply found that coming to class was a benefit to them (2004).

A study conducted by Richter, Durfee, Munson, Geyer, and Loendorf (2013) compared the effectiveness of positive rewards vs. penalties related to attendance in engineering technology coursework. The study used the term *carrot* for positive rewards and *stick* for penalties. The study evaluated the performance of students in courses that utilized the carrot approach, the stick approach, and neither approach in order to encourage attendance. In courses utilizing the carrot approach, students were awarded points toward their grade for attendance. In courses utilizing the stick approach, students had points deducted from their grade for being absent. In the courses utilizing neither approach, no action was taken in relation to the student's attendance or absence. The average attendance for students in courses utilizing each approach was determined and the attendance data were compared to the average student grades in the course. Overall, the students in courses that utilized the carrot approach attended at a higher level than did students in courses that utilized the stick approach or neither approach. However, the students receiving the highest grades came primarily from courses that utilized neither approach or the stick approach. The researchers surmised that students in courses utilizing the carrot approach may have believed the impact of the points awarded for attendance would be more impactful and, as a result, may not have devoted enough time to the course. Overall, students who achieved the highest grades in their course seemed to be the least impacted by the approach utilized in the course. After their final analysis of the data, the researchers reported that the carrot approach resulted in the highest levels

of attendance, but the stick approach, or use of neither approach yielded higher course grades (Richter et al. 2013).

Zhu et al. (2019) conducted research related to the stringency of attendance policies and how they impacted student participation and course grades. The researchers measured how effective four different policies which utilized penalties for non-attendance were in compelling students to attend and be successful in their course. The attendance policies were divided into three main types, Stringent Attendance/Participation Policy (SAP); Moderate Attendance/Participation Policy (MAP); and Gentle Attendance/Participation Policy (GAP). In the SAP, students were only allowed two absences before they received an F grade in the course, and no excused absences were allowed. In the MAP, students were allowed six absences before they received an F grade in the course, and absences could be excused at the instructor's discretion. Additionally, the MAP policy lowered the student's grade percentage if they had more than two unexcused absences. In the GAP policy, a student's grade was lowered by a percentage for each unexcused absence. The researchers reported that the SAP resulted in the fewest absences while the GAP resulted in the most absences. The SAP policy resulted in fewer A grades and F grades, and the GAP policy resulted in the most A grades and F grades. Zhu et al. (2019) provided further confirmation that students who incur more absences earn lower course grades. While it was evident that more stringent attendance policies encouraged higher rates of attendance, the impact of the policy on student grades was not as clear.

## **Summary**

The correlation between class attendance and academic success of students continues to be an important topic of research and discussion. However, the body of recent research on the topic is limited. While there is significant research indicating that students who attend classes at a higher level are more academically successful, some research has found that requiring students to attend class can be detrimental to the student's perception of higher education. To further the complexity of the impact of mandatory attendance on academic performance, researchers have variable definitions of exactly what academic success means. Chapter 3 describes the methods used to conduct the study and includes a description of the research design, selection of participants, measurement, data collection procedures, data analysis and hypothesis testing, and limitation.

## **Chapter 3**

### **Methods**

This study investigated the impacts that the level of program attendance has on student success in a DC program. The cumulative attendance rates of three different groups of students whose 150% program (6 years) completion date fell during the 2017-2020 academic years (Fall 2017 - Summer 2020) were evaluated. The first purpose of the study was to investigate the correlation of level of attendance with persistence to graduation within 150% (6 years) of the standard program completion timeline. The second purpose of the study was to examine the impact of level of attendance on cumulative GPA at the completion of the program within 150% of the program standard completion timeline. The third purpose of the study was to determine how level of attendance impacted success in passing the NBCE Part I, Part II, Part III, and Part IV exams, which are required for professional licensure.

### **Research Design**

A quantitative research design was used in this study. Specifically, a causal-comparative design method was utilized. According to Creswell and Creswell (2018), in causal-comparative studies, “the investigator compares two or more groups in terms of a cause that has already happened” (p. 12). Variables for this study were persistence to graduation within six years of matriculation (150% of the standard program completion time), cumulative GPA at program completion or the end of six years (150% of the program standard completion timeline, and the performance (pass, fail) on Parts I, II, III, and IV of the NBCE board exams within 6 months after graduation within six years (150% of standard program completion time).

### **Selection of Participants**

Purposive sampling was used to select the subjects included in the database. This sampling method was used because the data for subjects was relevant to the topic being studied. The sample included 341 students whose anticipated graduation within 150% of the expected program completion date occurred during the 2017-2020 academic years (Fall 2017-Summer 2020). While this was not the most current group of students eligible for graduation at the time the study was conducted, these graduation years were chosen due to the disruption of course delivery and attendance taking methods that occurred beginning in March of 2020 and lasting until September of 2021 due to the COVID 19 pandemic. Participants for this study were sorted into three groups based upon their level of cumulative program attendance – those whose cumulative attendance was 95% or higher, those whose cumulative attendance rate ranged from 90% to 94.9%, and those whose cumulative attendance rate was less than 90%.

### **Measurement**

Archival data for each subject was obtained from the student information system utilized by CUKC. Data included persistence to graduation within 150% of standard completion after matriculation into the DC degree program, cumulative GPA at the time of graduation for those students who graduated within 150% of standard completion time, and scores (pass, fail) on NBCE Parts I, II, III, and IV board exams within 6 months after their graduation date. Data were anonymized by assigning a code known only to the researcher and all personally identifying information was removed from the database. A total of 120 subjects had a cumulative program attendance rate of 95% or higher, 164

students had a cumulative program attendance rate of 90% to 94.9%, and 57 students had a cumulative program attendance rate of less than 90%.

### **Data Collection Procedures**

Prior to conducting the research, verbal approval was received from the Director of Research and the chairperson of the CUKC IRB to utilize the name of the institution in this study. A request to conduct the study was submitted to the Baker University Institutional Review Board (IRB) on July 26, 2023. Permission was granted by the Baker University IRB on August 1, 2021(see Appendix A). Once the Baker IRB approval was granted, a request to conduct the study was submitted to CUKC on August 24, 2023. CUKC granted permission to conduct the study on October 12, 2023 (see Appendix B). Following receipt of permission from all parties, a request for data was sent to the registrar at CUKC to retrieve student data from the institution. Anonymized data were compiled and exported into a Microsoft Excel spreadsheet, then imported into IBM SPSS Statistics Version 28 for Microsoft Windows.

### **Data Analysis and Hypothesis Testing**

**RQ1.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on persistence to graduation within 150% of standard program completion time (six years) for DC students at CUKC?

**H1.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on persistence to graduation within 150% of standard program completion time (six years) of DC students at CUKC.

A chi-square test of independence was conducted to test H1 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table

was constructed for the two categorical variables: Attendance and persistence to graduation within 150% of standard program completion time. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

**RQ2.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on cumulative GPA at program completion for DC students who graduate within 150% of standard completion time at CUKC?

**H2.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on cumulative GPA of DC students who graduate within 150% of standard completion time at CUKC.

A one-factor analysis of variance (ANOVA) was conducted to test H2. The categorical variable used to group the dependent variable, cumulative GPA, was the cumulative program attendance category (95% or higher, 90% to 94.9%, or less than 90%). The results of the one-factor ANOVA can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. If the ANOVA rendered a significant result, a post-hoc pairwise comparison was conducted to examine where the differences among the 3 attendance groups are located. The level of significance for the post hoc was set at .05. When appropriate, an effect size is reported.

**RQ3.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part I exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?



**H3.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part I exam pass rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H3 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part I exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

**RQ4.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part II exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

**H4.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part II exam pass rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H4 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part II exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

**RQ5.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part III exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

**H5.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part III exam pass rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H5 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part III exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

**RQ6.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part IV exam pass rates of DC students who graduate within 150% of standard completion time at CUKC?

**H6.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part IV exam pass rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H6 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part IV exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

### **Limitations**

Lunenburg and Irby (2008) defined limitations as uncontrollable factors that could impact the interpretation and outcomes of research findings. This study was limited in that many factors can influence persistence to graduation within 150% of standard

completion time, cumulative GPA at graduation, and passage of chiropractic board exams. Some of those factors include admissions practices, institutional culture, and curriculum and instructional quality. Variable admissions practices may have impacted the quality of students admitted. Institutional culture may have impacted student attitudes and motivation. Curriculum and instructional quality may have impacted student learning and ability to succeed. Finally, since this study was conducted at only one institution offering a DC degree, the findings of the study may not be generalizable to other institutions that offer the DC degree.

### **Summary**

This chapter described the methods used to conduct this study that investigated the impact of three levels of program attendance (95% or higher, 90% to 94.9%, or less than 90%) on academic success of students in a DC degree program. The research design, selection of participants, measurement, data collection and procedures, data analysis and hypothesis testing, and limitations were explained in Chapter 3. Chapter 4 presents the results of the data analysis and hypothesis testing.

## **Chapter 4**

### **Results**

Chapter 4 contains the results of the data analysis. This chapter is organized with the descriptive statistics section first. Information about the students selected for the study is included in this section, including cumulative program attendance rate related to 150% program completion rate, cumulative GPA, and passage of Parts I, II, III, and IV of the National Board of Chiropractic Examiners (NBCE) exams.

#### **Descriptive Statistics**

The sample for this survey included 341 students whose graduation within 150% of the standard program completion time occurred during the 2017-2020 academic years (Fall 2017-Summer 2020). The students were sorted into three groups based upon their level of cumulative program attendance – those whose cumulative attendance was 95% or higher, those whose cumulative attendance rate ranged from 90% to 94.9%, and those whose cumulative attendance rate was less than 90%. Data examined for these students include persistence to graduation within 150% of standard completion after matriculation into the DC degree program, cumulative GPA at the time of graduation for those students who graduated within 150% of standard completion time, and scores (pass, fail) on NBCE Parts I, II, III, and IV board exams within 6 months after their graduation date for those students who graduated within 150% of standard completion time. The initial population included 341 students, all of whom were included in the analysis of RQ1. As a result of the analysis of RQ1, 283 of the students were found to have graduated within 150% of standard program completion time. Since the remaining research questions

looked only at students who graduated within 150% of standard program completion time, only those 283 students were included in the analysis of RQ2 through RQ6. Table 1 summarizes the breakdown of participants by level of cumulative program attendance.

Table 1

*Descriptive Statistics for Level of Cumulative Program Attendance*

Attendance	<i>N</i>	%
Initial Population		
<90.0%	57	16.7
90.0-94.9%	164	48.1
95.0%+	120	35.2
Graduated within 150%		
<90.0%	38	13.4
90.0-94.9%	145	51.2
95.0%+	100	35.4

### **Hypothesis Testing**

Research questions one through six as well as their associated hypotheses are presented in this section. The method of analysis and hypothesis testing results are included for each research question.

**RQ1.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on persistence to graduation within 150% of standard program completion time (six years) for DC students at CUKC?

**H1.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on persistence to graduation within 150% of standard program completion time (six years) of DC students at CUKC.

A chi-square test of independence was conducted to test H1 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and persistence to graduation within 150% of standard program completion time. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values,  $\chi^2(2) = 14.188$ ,  $p = .001$ , Cramer's  $V = .204$ . See Table 2 for the observed and expected frequencies. The observed frequency for students who attended < 90.0% and did not persist to graduation within 150% of standard program completion time (six years) of DC students at CUKC ( $n = 19$ ) was higher than the expected frequency ( $n = 9.7$ ). The observed frequency for students who attended < 90.0% ( $n = 19$ ) was higher than the expected frequency ( $n = 9.7$ ). The observed frequency for students who attended 90.0-94.9% and persisted to graduation within 150% of standard program completion time (six years) of DC students at CUKC ( $n = 145$ ) was higher than the expected frequency ( $n = 136.1$ ). H1 was supported. The level of program attendance has an impact on persistence to graduation within 150% of standard program completion time (six years) of DC students at CUKC. Those who attended at a level of less than 90% were less likely to graduate

within 150% of standard time than those who attended at a level of 90% or higher. The effect size indicated a small effect.

Table 2

*Observed and Expected Frequencies for H1*

Attendance	Grad $\leq$ 150%	$f_{\text{observed}}$	$f_{\text{expected}}$
<90.0%	Yes	38	47.3
	No	19	9.7
90.0-94.9%	Yes	145	136.1
	No	19	27.9
95.0%+	Yes	100	99.6
	No	20	20.4

**RQ2.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on the cumulative GPA at program completion for DC students who graduate within 150% of standard completion time at CUKC?

**H2.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on the cumulative GPA of DC students who graduate within 150% of standard completion time at CUKC.

A one-factor analysis of variance (ANOVA) was conducted to test H2. The categorical variable used to group the dependent variable, cumulative GPA, was the cumulative program attendance category (95% or higher, 90% to 94.9%, or less than 90%). The results of the one-factor ANOVA can be used to test for differences in the means for a numerical variable among three or more groups. The level of significance was set at .05. When an ANOVA rendered a significant result, a post-hoc pairwise

comparison was conducted to examine where the differences among the 3 attendance groups are located. The level of significance for the post hoc was set at .05. When appropriate, an effect size is reported.

The results of the analysis indicated a statistically significant difference between at least two of the means,  $F(2, 280)=28.276, p = .000, \eta^2 = .168$ . See Table 3 for the means and standard deviations for this analysis. A follow up post hoc was conducted to determine which pairs of means were different. The Tukey's Honestly Significant Difference (HSD) post hoc was conducted at  $\alpha = .05$ . The three means were significantly different. The mean for students with <90.0% attendance ( $M = 3.04$ ) was lower than the mean for students with 90.0-94.9% attendance ( $M = 3.19$ ) and the mean for students with 95.0%+ attendance ( $M = 3.45$ ). The mean for students with 90.0-94.9% attendance ( $M = 3.19$ ) was lower than the mean for students with 95.0%+ attendance ( $M = 3.45$ ). H2 was supported. Students who attended at higher levels achieved a higher average cumulative GPA. The effect size indicated a small effect.

Table 3

*Descriptive Statistics for the Results of the Test for H2*

Attendance	<i>M</i>	<i>SD</i>	<i>N</i>
<90.0%	3.0403	.31354	38
90.0-94.9%	3.1936	.32230	145
95%+	3.4501	.34127	100

**RQ3.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part I exam success rates of DC students who graduate within 150% of standard completion time at CUKC?



**H3.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part I exam success rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H3 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part I exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

The results of the chi-square test of independence could not be interpreted because 50% of the expected frequencies in the crosstabulation were less than 5. According to McHugh (2013), “The value of the cell *expecteds* should be 5 or more in at least 80% of the cells, and no cell should have an expected of less than one” (p. 144). Table 4 below displays the observed and expected frequencies for the test.

Table 4

*Observed and Expected Frequencies for H3*

Attendance	Part I Success	$f_{\text{observed}}$	$f_{\text{expected}}$
<90.0%	Pass	37	37.9
	Fail	1	.1
90.0-94.9%	Pass	145	144.5
	Fail	0	.5
95.0%+	Pass	100	99.6
	Fail	0	.4

**RQ4.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part II exam success rates of DC students who graduate within 150% of standard completion time at CUKC?

**H4.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part II exam success rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H4 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part II exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

The results of the chi-square test of independence could not be interpreted because 50% of the expected frequencies in the crosstabulation were less than 5. Table 5 below displays the observed and expected frequencies for the test.

Table 5

*Observed and Expected Frequencies for H4*

Attendance	Part II Success	$f_{\text{observed}}$	$f_{\text{expected}}$
<90.0%	Pass	37	38
	Fail	1	.4
90.0-94.9%	Pass	143	143.5
	Fail	2	1.5
95.0%+	Pass	100	98.9
	Fail	0	1.1

**RQ5.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part III exam success rates of DC students who graduate within 150% of standard completion time at CUKC?

**H5.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part III exam success rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H5 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part III exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

The results of the chi-square test of independence could not be interpreted because 50% of the expected frequencies in the crosstabulation were less than 5. Table 6 below displays the observed and expected frequencies for the test.

Table 6

*Observed and Expected Frequencies for H5*

Attendance	Part III Success	$f_{\text{observed}}$	$f_{\text{expected}}$
<90.0%	Pass	36	37.1
	Fail	2	.9
90.0-94.9%	Pass	141	141.4
	Fail	4	3.6
95.0%+	Pass	99	97.5
	Fail	1	2.5

**RQ6.** To what extent does the level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) have an impact on NBCE Part IV exam success rates of DC students who graduate within 150% of standard completion time at CUKC?

**H6.** The level of cumulative program attendance (95% or higher, 90% to 94.9%, or less than 90%) has an impact on NBCE Part IV exam success rates of DC students who graduate within 150% of standard completion time at CUKC.

A chi-square test of independence was conducted to test H6 because the relationship between two categorical variables was analyzed. A (3 x 2) frequency table was constructed for the two categorical variables: Attendance and Part IV exam success. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

The results of the chi-square test of independence could not be interpreted because 50% of the expected frequencies in the crosstabulation were less than 5. Table 7 displays the observed and expected frequencies for the test.

Table 7

*Observed and Expected Frequencies for H6*

Attendance	Part IV Success	$f_{\text{observed}}$	$f_{\text{expected}}$
<90.0%	Pass	36	37.2
	Fail	2	.8
90.0-94.9%	Pass	142	141.9
	Fail	3	3.1
95.0%+	Pass	99	97.9
	Fail	1	2.1

## **Summary**

The purpose of this study was to examine the impacts of level of cumulative program attendance on the academic success of students in a Doctor of Chiropractic degree program at Cleveland University-Kansas City. Academic success was measured by looking at persistence to graduation within 150% of standard completion time after matriculation into the DC degree program, cumulative GPA at the time of graduation for those students who graduated within 150% of standard completion time, and successful passage of the NBCE Parts I, II, III, and IV board exams within 6 months after their graduation date. Hypothesis testing supported the hypotheses regarding attendance level related to 150% completion and cumulative GPA. However, the expected frequencies in the test for those individuals who did not pass Part I, II, III, or IV were too small to provide an interpretation of the data. Chapter 5 provides a summary of the study, major findings related to the literature, recommendations for future research, and concluding remarks.

## Chapter 5

### Interpretation and Recommendations

The intent of this study was to examine the impact of levels of attendance on academic success of students in the Cleveland University-Kansas City Doctor of Chiropractic degree program. Chapter 5 begins with a summary of the study. The chapter also includes findings related to the literature, conclusions, implications for future actions, recommendations for further research, and concluding remarks.

#### Study Summary

A majority of researchers who have investigated college course attendance policies (Brocato, 1989; Buckalew et al., 1986; Chan et al., 1997; Chenneville & Jordan, 2008; Cohn & Johnson, 2006; Gatherer & Manning, 1998; Golding, 2011; Gunn, 1993; Kassarnig et al., 2017; Snell & Mekies, 1995; Verbeeten, 2004; Zhu et al., 2019) have supported the idea of mandatory attendance policies as a positive influence on student academic success. However, some authors including, St. Clair (1999), Hyde and Flournoy (1986) and Macfarlane (2013) indicated that attendance policies do not directly impact student success and that the negative feelings toward required attendance can negatively impact a student's success. The next sections present the overview of the problem, the purpose statement and research questions, review of the research methodology, and major findings.

**Overview of the problem.** Despite the amount of research related to attendance policies and student success, most of the research has focused on undergraduate courses that are lecture-based rather than graduate level health science programs consisting of lecture, lab, and clinical coursework. Graduate level healthcare programs require more

than successful completion of a course or of a degree program. Healthcare occupations also require successful passage of professional examinations and often state licensure exams. Gaining an understanding of the relationship between attendance and success in graduate level healthcare programs and on licensure examinations is necessary for the leaders of those programs to evaluate the adequacy of their attendance policies.

**Purpose statement and research questions.** The purpose of this study was to investigate the impacts that levels of attendance have on student success in lecture, lab, and clinical coursework in the DC program at one higher education institution, CUKC. The study examined cumulative attendance rates for students who completed the DC program within six years or 150% of the program standard completion timeline. Program completion was measured for students whose 150% program completion time occurred during the 2017-2020 academic years (Fall 2017-Summer 2020). Three purposes guided this study. The first purpose of the study was to investigate the impact of attendance on persistence to graduation within 150% of standard completion time. The second purpose of the study was to examine the impact of attendance on cumulative GPA for those students who completed the DC program within 150% of standard completion time. The third purpose of the study was to determine how attendance impacted success in passing the NBCE Part I, Part II, Part III, and Part IV exams, which are required for professional licensure, for those students who completed the DC program within 150% of standard completion time. Six research questions were developed to address these purposes.

**Review of the methodology.** A quantitative research design was used in this study. Specifically, a causal-comparative design method was utilized. Variables for this study were persistence to graduation within six years of matriculation (150% of the

standard program completion time), cumulative GPA at program completion within 150% of the program standard completion timeline, and the performance (pass, fail) on Parts I, II, III, and IV of the NBCE board exams within 6 months after graduation within six years (150% of standard program completion time).

**Major findings.** The results of the analysis showed a statistically significant finding in RQ1 and RQ2. However, the analyses for RQ3 through RQ6 could not be interpreted because 50% of the expected frequencies in the crosstabulation of the chi-square test of independence were less than 5. For RQ1, a small effect size was found related to level of attendance and graduation within 150% of standard completion time. As shown in table 2, the observed frequency for students who attended < 90.0% and did not persist to graduation within 150% of standard program completion time (six years) of DC students at CUKC ( $n = 19$ ) was higher than the expected frequency ( $n = 9.7$ ). The observed frequency for students who attended < 90.0% ( $n = 19$ ) was higher than the expected frequency ( $n = 9.7$ ). The observed frequency for students who attended 90.0-94.9% and persisted to graduation within 150% of standard program completion time (six years) of DC students at CUKC ( $n = 145$ ) was higher than the expected frequency ( $n = 136.1$ ). For RQ2, a small effect size was found related to level of attendance and cumulative GPA at graduation. The mean cumulative GPA for students with <90.0% attendance ( $M = 3.04$ ) was lower than the mean for students with 90.0-94.9% attendance ( $M = 3.19$ ) and the mean for students with 95.0%+ attendance ( $M = 3.45$ ). The mean for students with 90.0-94.9% attendance ( $M = 3.19$ ) was lower than the mean for students with 95.0%+ attendance ( $M = 3.45$ ).



## **Findings Related to the Literature**

While many researchers have found that greater levels of attendance result in higher levels of student success (Brocato, 1989; Buckalew et al., 1986; Chan et al., 1997; Chenneville & Jordan, 2008; Cohn & Johnson, 2006; Dey, 2018; Gatherer & Manning, 1998; Golding, 2011; Gunn, 1993; Kassarnig et al., 2017; Snell & Mekies, 1995; Verbeeten, 2004; Zhu et al., 2019), several different measures of academic success have been utilized. York et al. (2015) reported that a disproportionately large emphasis is placed on measuring academic success in relation to grades and GPA. The authors posited first that grades and GPA are not always an accurate measure of cognitive growth and learning. Second, grading can vary from institution to institution and does not provide a consistent comparison across institutions. Third, the lack of generalization that results from this narrow way of examining academic success may actually decrease the level of cohesion between institutions related to their priorities. As a result, York et al. suggested that practitioners utilize various methods that were cited in their study, in addition to utilization of grade and GPA measures. To diversify the measures of academic success utilized in this study, graduation within 150% of standard completion time and passage of the NBCE Part I, II, III, and IV licensure exams were measured in addition to cumulative GPA at graduation.

Although some researchers have found a negative impact related to mandatory attendance (Buchele, 2021, St. Clair, 1999), the results of this study agreed more with the findings of Marburger (2006) and Chen and Lin (2008), who reported that mandatory attendance policies resulted in students achieving higher levels of academic success. In this study, students with higher levels of attendance were more likely to graduate within

150% of the standard program completion time. Additionally, those with higher levels of attendance achieved a higher cumulative GPA than those who attended at lower levels.

These results support previous findings that higher levels of attendance will result in higher levels of academic success.

### **Conclusions**

This study was designed to analyze the relationship between levels of program attendance and academic success in a Doctor of Chiropractic degree program. The results of the study have implications for other Doctor of Chiropractic degree programs as well as for other graduate level professional healthcare education programs. While little research has been conducted related to levels of program attendance and academic success in graduate level healthcare education programs, this research represents a model that could be of benefit to other Doctor of Chiropractic degree programs as all of the measures utilized for academic success are measures that are required to be monitored and reported by the Council on Chiropractic Education which is the accreditor for all chiropractic education programs in the United States.

Although the sample of graduates who did not pass Parts I, II, III, or IV of the NBCE exams was too small to analyze, hypothesis testing did provide evidence that higher attendance levels resulted in increased persistence to graduation and higher cumulative GPA. The findings of this study demonstrated that there is a direct correlation between levels of attendance and levels of graduation within 150% of standard program completion time and with cumulative GPA at the point of graduation. These results could assist academic administrators of other Doctor of Chiropractic degree

programs as they review their own attendance policies and consider whether changes should be made.

**Implications for action.** The following three actions are recommended based on the findings of the current study:

1. The researcher will present the results of this study to the CUKC Executive Council which is responsible for review and approval of institutional policy.
2. An executive summary of findings and recommendations will be created to share with academic support staff at CUKC. The summary will include a recommendation that academic support staff communicate to students the value of attendance and its impact on their academic success in the program.
3. A recommendation will be given to the DC academic leadership team that they share the results of this study with their colleagues at other institutions and encourage them to replicate the study in their own programs.

**Recommendations for future research.** The results of this study will be beneficial to institutions with DC degree programs, as well as other graduate level health care education programs regarding the value of required attendance and its impact on the academic success of their students. Recommendations for future research include the following three suggestions:

1. The study included only one DC degree program. Future research should include additional institutions with DC programs.
2. The current study included a DC program with the highest post-graduation NBCE board exam pass rate in the country. The high NBCE pass rate may have resulted in the inability to complete the data analyses for RQ3 through

RQ6. Future research should be conducted at institutions with a lower NBCE pass rate than CUKC. These institutions would be more likely to have student NBCE pass rates conducive to analysis of these research questions.

3. The current study used a quantitative research design to measure student success. In the future, adding a qualitative component to the study would allow students to provide feedback regarding their opinions of mandatory attendance and what impacts it might have on their attitudes toward the institution.

**Concluding remarks.** Higher education institutions who educate healthcare providers have an obligation to ensure that their graduates are prepared to provide quality care to the members of society who they serve. One way that institutions who prepare Doctors of Chiropractic can demonstrate this is by offering high quality programs and having high attendance expectations. This study further expanded the research findings of the impact of levels of attendance on academic success of students in higher education, specifically research related to persistence to graduation and cumulative GPA for students in Doctor of Chiropractic degree programs. The findings of this study may be of interest to the academic leaders of other institutions with Doctor of Chiropractic programs as they strive to prepare the most skilled practitioners to enter the field. Academic leaders of other graduate level healthcare programs may find this study to be of benefit as well and may also wish to explore other measures of academic success related to their particular field.

## References

- Brocato, J. (1989). How much does coming to class matter? Some evidence of class attendance and grade performance. *Educational Research Quarterly*, 13, 2–6.
- Buchele, S. (2021). Evaluating the link between attendance and performance in higher education: The role of classroom engagement decisions. *Assessment & Evaluation in Higher Education*, 46(1), 132-150.
- Buckalew, L. W., Daly, J. D., & Coffield, K. E. (1986). Relationship of initial class attendance and seating location to academic performance in psychology classes. *Bulletin of the Psychonomic Society*, 24, 63–64.
- Chan, K. C., Shum, C., & Wright, D. J. (1997). Class attendance and student performance in principles of finance. *Financial Practice and Education*, 7, 58–65.
- Chen, J., & Lin, T. (2008). Class attendance and exam performance: A randomized experiment. *Journal of Economic Education*, 39(3), 213-227.
- Chenneville, T., & Jordan, C. (2008). Impact of attendance policies on course attendance among college students. *Journal of the Scholarship of Teaching and Learning*, 8(3), 29-35. Retrieved from <https://eric.ed.gov/?id=EJ854856>
- Ching, G. S. (2012). Looking into the issues of reward and punishment in students. *International Journal of Research Studies in Psychology*, 1(2), 29-38.
- Cleveland University-Kansas City. (2015). *2015-2016 CUKC academic catalog*. Retrieved from <https://www.cleveland.edu/academics/university-catalogs/>
- Cleveland University-Kansas City. (2016). *2016-2017 CUKC academic catalog*. Retrieved from <https://www.cleveland.edu/academics/university-catalogs/>

- Cleveland University-Kansas City. (2023). *2022-2023 CUKC academic catalog*. Retrieved from <https://www.cleveland.edu/academics/university-catalogs/>
- Cohn, E., & Johnson, E. (2006). Class attendance and performance in principles of economics. *Educational Economics, 14*, 211–233.
- Council on Chiropractic Education. (2022). *CCE manual of policies*. Retrieved from [https://www.cce-usa.org/uploads/1/0/6/5/106500339/2022-01\\_cce\\_manual\\_of\\_policies\\_\\_current\\_.pdf](https://www.cce-usa.org/uploads/1/0/6/5/106500339/2022-01_cce_manual_of_policies__current_.pdf)
- Council on Chiropractic Education. (2023). *CCE members*. Retrieved from <https://www.cce-usa.org/members.html>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: SAGE Publications.
- Dey, I. (2018). Class attendance and academic performance: A subgroup analysis. *International Review of Economics Education, 28*, 29-40.
- Doggrell, S. (2021). Quantitative study of lecture attendance and the association between this attendance and academic outcomes for nursing and non-nursing students in an introductory pathophysiology course. *Advances in Physiology Education, 45*, 651-660. doi:10.1152/advan.00037.2021
- Gatherer, D., & Manning, F. C. R. (1998). Correlations of examination performance with lecture attendance: A comparative study of first-year biology sciences undergraduates. *Biochemical Education, 6*, 121–23.
- Garcia y Garcia, B. E. (2021). To what factors do university students attribute their academic success? *Journal on Efficiency and Responsibility in Education and Science, 14*(1), 1-8.

- Golding, J. M. (2011). The role of attendance in lecture classes: You can lead a horse to water... *Teaching of Psychology*, 38(1), 40-42. doi:10.1177/0098628310390915
- Gump, S. E. (2004). Keep students coming by keeping them interested: Motivators for class attendance. *College Student Journal*, 38(1), 157-160.
- Gunn, K. P. (1993). A correlation between attendance and grades in a first-year psychology class. *Canadian Psychology*, 34, 201–202.
- Guterman, O. (2020). *Academic success from an individual perspective: A proposal for redefinition*. <https://doi.org/10.1007/s11159-020-09874-7>
- Hyde, R. M., & Flournoy, D. J. (1986). A case against mandatory lecture attendance. *Journal of Medical Education*, 61(3), 175-176.
- Karnik, A., Kishore, P., & Meraj, M. (2020). Examining the linkage between class attendance at university and academic performance in an international branch campus setting. *Research in Comparative & International Education*, 15(4), 371-390.
- Kassarnig, V., Bjerre-Nielsen, A., Mones, E., Lehmann, S., & Dreyer Lassen, D. (2017). *Class attendance, peer similarity, and academic performance in a large field study*. doi:10.1371/journal.pone.0187978.
- Knight, L. J., & McKelvie, S. J. (1986). Effects of attendance, note-taking, and review on memory for a lecture: Encoding vs. external storage functions of notes. *Canadian Journal of Behavioural Science*, 18(1), 52-61.

- Lamb, S., Chow, C., Lindsley, J., Stevenson, A., Roussel, D., Shaffer, K., & Samuelson, W. (2020). *Learning from failure: How eliminating required attendance sparked the beginning of a medical school transformation*. <https://doi.org/10.1007/s40037-020-00615-y>
- Lebedina-Manzoni, M. (2004). To what students attribute their academic success and unsuccess. *Education*, 124(4), 699-708.
- Life University. (2023). *2022-2023 academic catalog*. Retrieved from <https://catalog.life.edu/index.php?catoid=27>
- Lochner, L. (2011). *Non-production benefits of education: Crime, health, and good citizenship* (Working Paper 16722). Retrieved from National Bureau of Economic Research. <http://www.nber.org/papers/w16722>
- Lunenburg, F. C., & Irby, B. J. (2008). *Writing a successful thesis or dissertation: Tips and strategies for students in the social and behavioral sciences*. Thousand Oaks, CA: Corwin Press.
- Macfarlane, B. (2013). The surveillance of learning: A critical analysis of university attendance policies. *Higher Education Quarterly*, 67(4), 358-373.
- Marburger, D. R. (2006). Does mandatory attendance improve student performance? *Journal of Economic Education*, 37(Spring), 148-155.
- McHugh, M. L. (2013). The chi-square test of independence. *Biochemia Medica*, 23(2), 143-149.
- Moore, R. (2005). Attendance: Are penalties more effective than rewards? *Journal of Developmental Education*, 29(2), 26.



- Murray, J. (2009). The wider social benefits of higher education: What do we know about them? *Australian Journal of Education*, 53(3), 230-244.
- National Board of Chiropractic Examiners. (n.d.-a). *Exams and testing*. Retrieved from <https://www.nbce.org/links-to-nbce-exams/>
- National Board of Chiropractic Examiners. (n.d.-b). *Part I*. Retrieved from <https://mynbce.org/part-i/>
- National Board of Chiropractic Examiners. (n.d.-c). *Part II*. Retrieved from <https://mynbce.org/part-ii/>
- National Board of Chiropractic Examiners. (n.d.-d). *Part III*. Retrieved from <https://mynbce.org/pt-iii/>
- National Board of Chiropractic Examiners. (n.d.-e). *Part IV*. Retrieved from <https://mynbce.org/part-iv-2/>
- Nyatanga, P., & Mukorera, S. (2019). Effects of lecture attendance, aptitude, individual heterogeneity and pedagogic intervention on student performance: A probability model approach. *Innovations in Education and Teaching International*, 56(2), 195-205.
- Parker University. (2015). *2015-2016 academic catalog*. Retrieved from [https://www.parker.edu/wp-content/uploads/2015/12/MASTER\\_-Parker-University-Catalog\\_2015-2016\\_TLT12\\_18\\_2015.pdf](https://www.parker.edu/wp-content/uploads/2015/12/MASTER_-Parker-University-Catalog_2015-2016_TLT12_18_2015.pdf)
- Redwood, D., & Cleveland, C.S. (2003). *Fundamentals of chiropractic*. Maryland Heights, MO: Mosby.

- Richter, D. C., Durfee, J. K., Munson, D. M., Geyer, T., & Loendorf, W. R. (2013, June). *A formal research study on correlating student attendance policies to student success*. Paper presented at the American Society for Engineering Education 120<sup>th</sup> Annual Conference and Exposition, Atlanta, GA.
- Rocca, K. A. (2004). College student attendance: Impact of instructor immediacy and verbal aggression. *Communication Education, 53*(2), 185-195.
- Romer, D. (1993). Do students go to class? Should they? *Journal of Economic Perspectives, 7*(3), 167-174.
- Sibanda, L., Iwu, C. G., & Benedict, O. H. (2015). Factors influencing academic performance of university students. *Demography and Social Economy, 2*(24), 103-115.
- Snell, J., & Mekies, S. (1995). Student attendance and academic achievement: A research note. *Journal of Instructional Psychology, 22*, 126–130.
- St. Clair, K. L. (1999). A case against compulsory class attendance policies in higher education. *Innovative Higher Education, 23*, 171–180.
- Sykes, C. (2016). *Fail U: The false promise of higher education*. New York, NY: St. Martin's Press. ISBN:9781250071590
- Verbeeten, M. J. (2004). *Mandatory attendance policy and motivation* (Doctoral dissertation). Retrieved from ProQuest Dissertations Publishing. (UMI No 189080)
- York, T. T., Gibson, C., & Rankin, S. (2015). Defining and measuring academic success. doi: <https://doi.org/10.7275/hz5x-tx03>.

Zhu, L., Huang, E., Defazio, J., & Hook, S. (2019). Impact of the stringency of attendance policies on class attendance/participation and course grades. *Journal of the Scholarship of Teaching and Learning*, 19(2), 130-140.

Zumeta, W., Breneman, D., Callan, P. M., & Finney, J. (2012). *Financing American higher education in the era of globalization*. Cambridge, MA: Harvard Education Press.

## Appendices

**Appendix A: Baker University IRB Approval**



*Baker University Institutional Review Board*

Aug 1, 2023

Dear David Foose and Tes Mehring,

The Baker University IRB has reviewed your project application and approved this project under Exempt Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at [skimball@bakeru.edu](mailto:skimball@bakeru.edu) or 785.594.4563.

Sincerely,



*Scott Kimball*, PhD  
Chair, Baker University IRB

Baker University IRB Committee  
Jiji OsOsiobe, PhD  
Tim Buzzell, PhD  
Susan Rogers, PhD

**Appendix B: Cleveland University – Kansas City IRB Approval**

Cleveland University – Kansas City Institutional Review Board

No. 2023.10.12.1

October 12<sup>th</sup>, 2023

Dear Dr. Mark Pfefer and Mr. David Foose,

The proposal titled “Impacts of Levels of Mandatory Attendance on Academic Success of Students in a Doctor of Chiropractic Degree Program”, is **approved** under **expedited** status for the following reason:

Collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. The research involves is considered minimal risk as defined by 45 CFR 46.102 as the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. This approval is valid for one year from the date of this letter unless renewed. PI(s) are responsible for submitting renewal request in a timely manner.

Please be aware of the following:

1. The above determination has been made using the current information of the submitted proposal. Obtain IRB approval for any proposed change to the research plan prior to its implementation (The only exception is if the human subject is in immediate risk).
2. If the results of the research are used to prepare papers for publication or presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
3. Personally conduct or supervise the research
4. The primary investigator must retain the signed consent documents of the research activity (if applicable).
5. Maintain written records of IRB reviews and decisions.
6. Unanticipated problems involving risks to subjects or others including adverse events, safety reports received from the sponsor, or data safety and monitoring summary reports must be reported to the IRB within five days.
7. Obtain continuation approval from the IRB if applicable.
8. Make provisions for the secured retention of complete research records and all research materials and ensure confidentiality of information regarding human subjects.
9. Verify that IRB approval has been obtained from all participating organizations in collaborative activities with other organizations.





10. Notify the IRB regarding the emergency use of an investigational drug or device within five business days (if applicable).
11. Notify the IRB of any relevant new information that may impact the safety/security of subjects' health or privacy.
12. Principal investigators are responsible for retaining signed consent documents, IRB correspondence, and research records for at least three years after the completion of the research activity.

If you have any questions or concerns, please feel free to contact me.

Sincerely,

*Soheil Negahbani*

**Amirsoheil Negahbani, Ph.D.**

Associate Professor of Chemistry & Pharmaceutical Sciences  
Chair, Institutional Review Board (IRB)  
Cleveland University-Kansas City  
Email: Amirsoheil.negahbani@cleveland.edu  
Phone: 913.234.0666

