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A COMPARISON OF STUDENT SUCCESS BY FACULTY QUALIFICATIONS

A COMPARISON OF STUDENT SUCCESS BY FACULTY QUALIFICATIONS

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Workforce Development Education

By

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December 2012
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Abstract

Providing the best qualified faculty to ensure the most successful student outcomes is a priority in higher education. The use of adjunct faculty in colleges and universities is continually increasing, especially for lower level courses. Previous research has come to conflicting conclusions regarding the quality of adjunct faculty. Indicators of student success were compared between part-time instructors with professional doctoral degrees and full-time instructors with academic doctoral degrees. Results of statistical analyses of both a comparison of final grade distributions and knowledge of course content determined that there were no significant differences between two comparable groups of students in a freshman-level anatomy and physiology course. There were also no statistically significant differences in student outcomes of the subsequent course of anatomy and physiology or in the acceptance rates of students to allied health programs based on their instructors' qualifications in the first semester anatomy and physiology course. The results of this study suggest that students of part-time faculty with professional doctoral degrees have the same levels of success as those students who had full-time faculty in the same course.

This dissertation is approved for recommendation to the Graduate Council.

Dissertation Director:

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Dr. Michael T. Miller

Dissertation Committee:

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Dr. Kit Kacirek

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Dr. Adam Morris

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sister, children, and grandchildren have all given me their total support and fed my drive to continue to achieve. I only hope that my example will inspire my progeny to life-long learning and self-improvement.

Dedication

I would like to dedicate this work to all those persons who have a dream to better themselves through education. Unfortunately, not everyone can reach their lifelong educational goals because life gets in the way. This is for the ones who don't have the opportunity, those who don't have the means, those who are sacrificing their chance for others, and those whose dreams were diverted because of illness. This is for you, Emily.

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Chapter One

Introduction

Because student learning is the ultimate goal of education, delivering quality education is central to the mission of higher educational institutions. Student outcomes, which are indicators of quality education, are increasingly used as part of the funding formulas in higher education (Brenneman, Callan, Ewell, Finney, Jones, & Zis, 2010). The outcomes of student learning can be assessed by exams, GPA, acceptance into professional academic programs, and employment. Student learning is a product of instruction, and performance of faculty is at the heart of this endeavor. Consequently, the quality of the faculty in higher education is important. With the increasing use of adjunct faculty in higher education, evidence of faculty performance should be closely evaluated to identify changes in quality of education.

Status of the Issue

Because the measure of performance is not uniform among, or even within institutions, it is difficult to describe a standard faculty model in an American college or university. The variability of both institution and their faculties depends on the mission of the institution, the culture of the institution, the discipline, and other factors. Higher education institutions vary from technical schools to small private two-year college to large public research universities. The faculty can be as diverse as the institutions that have hired them. Most full-time faculty members in American colleges or universities, however, have job duties in three areas that include teaching, scholarship, and service. These requirements are used for evaluation for tenure and promotion, or renewal of contracts. Fairweather (2002) described an instructor who is

simultaneously productive in research and teaching as the "complete" faculty member. The author went on to say that few faculty members meet those criteria by excelling in all areas. Depending on the institution, expectations to fulfill these activities can be weighted differently (Jacobs, 2004).

A model for faculty in higher education could be implied through awards granted by respected organizations in higher education. The Council for Advancement and Support of Education (CASE), along with the Carnegie Foundation for the Advancement of Teaching, sponsor national and state professors of the year award programs. Criteria for these awards are determined by excellence in: "impact on and involvement with undergraduate students; scholarly approach to teaching and learning; contributions to undergraduate education in the institution, community and profession; and support from colleagues and current and former undergraduate students" (Carnegie Foundation, 2012). The difficulty with using these criteria for model faculty is that even these sponsoring organizations have different categories for faculty by their institutions as defined by the Carnegie classification system. In other words, there are no uniform performance standards to determine award winners. Details of the criteria, such as the precise definition of "scholarly approach to teaching and learning" for the categories of faculty, are left to the nominating individuals and the series of panels of judges to determine.

To ensure quality education and institutional effectiveness, institutions of higher education are periodically evaluated for accreditation. Accreditation is also necessary for eligibility for federal funds and student financial aid. In 2008, the American Association of University Professors (AAUP) reported that part-time faculty are mostly not specifically addressed by accrediting organizations but are usually included in "the faculty." Some

accrediting agencies only require anonymous student evaluations of part-time instructors as documentation of quality in the classroom (American Association of University Professors, 2008). This problem is only symptomatic of the larger issue of defining a model for any educator in American higher education that is based on the quality of educating students.

Student outcomes may be the best indicators of quality education (Brenneman, Callan, Ewell, Finney, Jones, & Zis, 2010). Previous research is unclear regarding the quality of adjunct faculty based on student performance and evaluations. Many studies indicate that adjunct faculty are not on par with full time faculty in quality which can negatively impact student success (Jaeger & Hinz, 2008; St. Charles, 2002; Gappa & Leslie, 1993). Other research has found no significant difference between the two faculties (Landrum, 2009; Ronco & Cahill, 2004; Wright,1995; Garcia, 1994). These conflicting results may be due to differences in qualifications of faculty or differences in content areas. Higher education administrators may need to evaluate the use of adjunct faculty in individual courses or programs.

Problem Statement

Student success may be the ultimate gauge for the measure of faculty performance and quality education. Early academic success can set the tone for student achievement and retention (Reason, Terenzini, & Domingo, 2006). Inadequate preparation by an ill-equipped instructor could result in early attrition. The quality of teaching skills could affect student success, not only in the course being taught, but could also influence student performance in subsequent courses and programs. In many institutions, adjunct faculty carry most of the burden of teaching entry level general education courses (Green, 2007). This is a critical time for students who are making the transition into higher education. If freshmen do not have a positive experience

during the first year and successfully complete their entry-level coursework, they may be more likely to drop out (Lifton, Cohen, & Schlesinger, 2007).

Many freshman level courses are taught by adjuncts, permanent part-time faculty, graduate students, or instructors who are new to teaching. Most of these faculties are hired on a contingent, or term-by-term, as-need basis. For the purpose of this study, any instructors who are not permanent, full-time faculty will be referred to as adjunct or as part-time faculty. Because of cost-effectiveness and flexibility, adjunct faculty are an integral component of the workforce at most post-secondary institutions and especially at community colleges.

Institutions of higher education are becoming increasingly dependent on faculty who are not hired as full-time instructors. The employment opportunities for faculty in post-secondary education are growing at a faster than average rate and are expected to increase by 15% from 2008 to 2018 (United States Bureau of Labor Statistics, 2012). However, most of these jobs will go to part-time employees (Gappa, 2000). In fact, Knapp, Kelly-Reid, and Ginder (2011) reported that instructional staff at degree-granting institutions increased from about 1.1 million in the fall of 2004 to about 1.2 million in 2010. The authors also asserted that, during the same time, full-time instructional staff decreased from 49 to 45% of the total instructional staff employees at these institutions.

Since many of the entry level courses are taught by adjunct faculty, available personnel to fill these positions may include persons in professional practices who are currently working, or have previously worked, outside of higher education. The professionals with doctoral degrees typically have degrees in their fields of practice, while full-time faculty have academic degrees in their discipline. Academic doctoral degrees include Doctorate of Philosophy (Ph.D.),

Doctorate of Arts (D.A.), and Doctorate of Education (Ed.D.). These degrees focus on advanced studies in theoretical content of a specific discipline. On the other hand, professional degrees involve training for a specific profession such Doctor of Medicine (M.D.), Doctor of Chiropractic (D.C.), Doctor of Veterinary Medicine (D.V.M.), Doctor of Dental Surgery (D.D.S.), Juris Doctor (J.D.), etc.

This study specifically focused on the comparison of full-time faculty with academic doctoral degrees and adjunct faculty with professional doctoral degrees, both of whom were hired to teach the first of a two-semester sequence of anatomy and physiology courses. I compared the success of second semester students based on their first semester instructor qualifications as measured by exam scores, grades, persistence, and acceptance into clinical programs of study.

Purpose of the Study

The purpose for conducting the study was to determine if a significant difference existed in student success between full-time faculty with academic degrees and adjunct faculty with professional degrees. Success was determined by exam scores, passing grades, persistence, and acceptance into subsequent programs.

The study focused on a comparison between full-time faculty and adjunct faculty teaching an entry level course in anatomy and physiology. Adjunct faculty are important to institutional budget constraints, decreased funding, retirements of present faculty, and changing enrollments from semester to semester because they can be hired quickly, as needed, at cheaper costs, and without perks (Green, 2007; Jacobs, 2004). The use of adjunct faculty in post-secondary institutions has increased from 30.2 % in 1975 to 48 % in 2005 (Monks, 2009). The

number of adjunct instructors is even higher reaching 70 % at some two-year institutions (American Federation of Teachers Higher Education, 2010). In the literature, authors are not consistent when defining adjunct faculty and may exclude some instructors who are not permanent full-time employees. This could result in studies that may be misleading. A national survey conducted by the American Federation of Teachers Higher Education (2010) reported that almost three-quarters of all undergraduate teachers at higher educational institutions were not full-time professors.

Anatomy and physiology courses are required for allied health programs. The content is traditionally delivered over two semesters as sequenced courses. Basic content is contained in the first semester course which provides a foundation for continuation into the second semester course. In this study, student outcomes of a two-semester sequence of anatomy and physiology courses were compared between full-time faculty with academic degrees and adjunct faculty with professional degrees.

My research question was: Are students, who have had adjunct instructors with professional doctoral degrees in the first of a two-semester sequence of courses, as successful as those who had full-time instructors with academic doctoral degrees?

Questions to be Answered

The research questions addressed in this study were:

1. Was there a significant difference between Anatomy and Physiology II (AP2) students who had full-time faculty with academic doctoral degrees or adjunct faculty with professional doctoral degrees in Anatomy and Physiology I (AP1)?

a. What were the profiles of the two student populations? Compare data, demographics, majors, and COMPASS/ACT scores.

b. Were there significant differences in the performance of students, based on AP1 post-test scores and instructor qualifications?

c. Was there a significant difference between the AP1 final grades based on instructor qualifications?

2. Was there a significant difference in AP2 completion patterns based on AP1 instructor qualifications?

3. Was there a significant difference in completion rates and final grades for students completing AP2 based on AP1 instructor qualifications?

4. Was there a significant difference between the successes of AP2 students based on AP1 instructor qualifications?

5. Was there a significant difference in acceptance rates for students in their programs of study based on AP1 instructor qualifications?

Significance of the Study

Finding qualified instructors is an ongoing concern for higher education institutions. Because retention and graduation rates are part of the funding formulas for institutions of higher learning, student success is important in all courses. In 2005, a national task force, chaired by Frank Keating (former Governor of Oklahoma) and Richard W. Riley (former Secretary of Education and former Governor of South Carolina), recommended improvement in teacher effectiveness as a measure of accountability in higher education (Brenneman, Callan, Ewell, Finney, Jones, & Zis, 2010). Employing the best qualified faculty is the first step in meeting this

recommendation. It is in this way that hiring practices can be related to student success and retention. Because hiring faculty should be based on student success as the ultimate criteria, this study was designed to assist with institutional hiring practices.

Since the use of adjunct faculty is increasing in higher education, their quality is at question. In September 1997, representatives from eight disciplinary associations (the American Historical Association, the American Mathematical Society, the American Philosophical Association, the American Political Science Association, the American Sociological Association, the Modern Language Association, the National Council of Teachers of English, and the Organization of American Historians) and from the American Association of University Professors and the Community College Humanities Association developed a statement concerning the growing use of part-time and adjunct faculty. One conclusion was that the use of many part-time and adjunct faculty appointments are justified based on needs to fill vacancies in the classroom and on financial constraints. However, the terms and conditions of these appointments are often a detriment to providing essential educational experiences and resources. Moreover, these appointments are often inadequate to support responsible teaching (American Association of University Professors, 1997).

Research regarding the quality of adjunct faculty is conflicting and has mostly come from studies at community colleges which hire a predominance of part-time faculty (Leslie & Gappa, 2002). Many studies lament the use of part-time faculty for academic success, while other research states that there is no difference between the performances of adjunct versus full-time faculty and student success (Landrum, 2009). If students are inadequately prepared by their instructor, they may be set up for failure in their subsequent courses. This experience could

result in decisions that lead to student attrition in subsequent courses and possibly their program of study (Lifton, Cohen, & Schlesinger, 2007).

Bettinger and Long (2010) reported that "little literature examines the role of instructor quality in higher education or the impact of adjunct instructors, but the few that exist rely on data aggregated to the school or subject level" (p. 599). The authors went on to say, "One reason for the lack of research has been the inability to link individual collegiate outcomes to instructors' characteristics, and only recently have researchers been able to measure the relative effectiveness of different types of instructors using the microdata of a particular course" (p. 599). For this reason, this study compared data from students enrolled in a specific course based on the qualifications of its faculty.

Limitations and Delimitations

Seven semesters of data from a two-semester sequence of anatomy and physiology courses at a small regional mid-south university were used for this study. This study used the researcher's students and data from one course and from one institution. No data from other courses, other instructors of the same course, or other institutions were used. Therefore, results of this study may not reflect other sequenced courses or results from other institutions.

Even though the part-time faculty in this study had doctoral degrees, the degrees were in professional areas rather than academic degrees of the full-time faculty. The degrees of the part-time faculty were varied and included professional doctorates in veterinary medicine, medicine, and chiropractic. This study did not determine if a difference existed in student success between adjunct instructors based on their degrees. Nor did the study investigate the difference in student success between full-time instructors and their academic degrees which included Ph.D. and D.A.

Conclusions of this study can only be generalizable to part-time and full-time faculty with doctoral degrees.

Academic success measured by exam scores, assigned grades, and retention do not completely reflect the students' experiences. Factors external to the academic environment can influence these variables and are not under the control of the university. These might include personal decisions to drop from class or school due to employment, pregnancy, or other situations outside of academics. However, these could potentially affect students of both full-time and adjunct faculty.

Definitions of Key Terms

1. Academic degree: A degree that is based on the study of theory within a specific discipline. The Institute of Educational Sciences (IPEDS) National Center for Educational Statistics describes a doctor's degree in research /scholarship as:

> A Ph.D. or other doctor's degree that requires advanced work beyond the master's level, including the preparation and defense of a dissertation based on original research, or the planning and execution of an original project demonstrating substantial artistic or scholarly achievement. Some examples of this type of degree may include Ed.D., D.M.A., D.B.A., D.Sc., D.A., or D.M, and others, as designated by the awarding institution. (U.S. Department of Education, 2012)

2. Adjunct faculty: Faculty that are hired on a part-time, temporary, as-need basis. According to the Institute of Educational Sciences (IPEDS) National Center for Educational Statistics adjunct faculty are:

> Non-tenure track faculty serving in a temporary or auxiliary capacity to teach specific courses on a course-by-course basis. Includes both faculty who are hired to teach an academic degree-credit course and those hired to teach a remedial, developmental, or ESL course; whether the latter three categories earn college credit is immaterial. Excludes regular part-time faculty (who, unlike adjuncts are not paid on a course-by-course basis), graduate assistants, full-time professional staff of the institution who may teach individual courses (such as a dean or academic advisor), and appointees who teach non-credit courses exclusively. (U.S. Department of Education, 2012)

3. Content knowledge: Knowledge specific to course content as determined by scores of 0 to 100 on a common pre-test or post-test measured on a ratio scale.

4. Full-time faculty: Faculty that are hired on a full-time permanent basis to teach specific courses in which they have received specific training. Full-time faculty are defined by the Institute of Educational Sciences (IPEDS) National Center for Educational Statistics as:

> Those members of the instruction/research staff who are employed full time and whose major regular assignment is instruction, including those with released time for research. Also, includes full-time faculty for whom it is not possible to differentiate between teaching, research and public service because each of these functions is an integral component of his/her regular assignment. (U.S. Department of Education, 2012)

At the case institution, tenure was unavailable for full-time faculty.

5. Persistence: Continuous enrollment and full-time attendance by a student to graduation.

6. Professional degree: A degree that is based on the practice of a profession. A doctor's degree in professional practice is defined by the Institute of Educational Sciences (IPEDS) National Center for Educational Statistics as:

> A doctor's degree that is conferred upon completion of a program providing the knowledge and skills for the recognition, credential, or license required for professional practice. The degree is awarded after a period of study such that the total time to the degree, including both pre-professional and professional preparation, equals at least six full-time equivalent academic years. Some of these degrees were formerly classified as first-professional and may include: Chiropractic (D.C. or D.C.M.); Dentistry (D.D.S. or D.M.D.); Law (L.L.B. or J.D.); Medicine (M.D.); Optometry (O.D.); Osteopathic Medicine (D.O); Pharmacy (Pharm.D.); Podiatry (D.P.M., Pod.D., D.P.); or, Veterinary Medicine (D.V.M.), and others, as designated by the awarding institution. (U.S. Department of Education, 2012)

7. Student success: Completion of a specified course with a grade of "C" or better measured on a dichotomous nominal scale as "passed" or "not passed." Student success in a course is traditionally defined as a passing grade, which is a subjective measure based on criteria determined by individual faculty. This construct may, or may not, reflect the same level of student achievement because of different student expectations by faculty. Regardless of the content knowledge gained during a course, student success as defined by a letter grade of "C" or better allows students to progress in their degree programs. Student success can also be defined in terms of persistence, or continuous enrollment to graduation. Finally, student success can also

be indicated by employment or acceptance in successive academic programs such as medical school or allied health programs, etc.

8. Two-semester sequence of courses: Courses that contain more content than can be covered over one semester, resulting in the material being divided over two semesters.

Conceptual Framework

The conceptual framework for this study was based on models that tie faculty to academic performance and student persistence, and on research that compares the quality of faculty based on part-time vs. full-time status. The conceptual framework was partly based on Terenzini and Reason's (2005) model of influences on student learning and persistence. According to this model, students' pre-college characteristics and experiences, along with their college experiences, affect student outcomes. Pre-college characteristics include socio-demographic traits and abilities that students bring to college. High school curriculum would be an example of a pre-college experience. In this model of influences on student learning and persistence, college experience is divided into organizational context and individual student experiences. Organizational context includes the organizational structures, policies, and practices of the institution, and faculty culture. Individual student experiences include the students' classroom experiences, out-of-class experiences, and curricular experiences. In both organizational context and individual student experiences, this model implicates faculty influences on student learning and persistence through curriculum development, pedagogical approaches, and behaviors of instructors (Reason, Terenzini, & Domingo, 2006). My study focused only on this portion of the Terenzini and Reason's (2005) model as it pertains to faculty and student outcomes.

Behaviors of instructors can lead to greater academic performance. According to Reason, Terenzini, & Domingo (2006), teacher preparation and availability produced increased critical thinking skills and improved learning among students. These authors went on to say that the greatest amount of content acquisition and mastery that occurred outside the classroom were interactions with faculty (and peers), which reinforced content delivered in the classroom. According to Tinto's (1993) model of student retention, persistence also depends partly on positive daily faculty-student interactions.

Adjunct faculty are an integral component of the workforce at most post-secondary institutions and especially at community colleges. Adjunct faculty, as a group, are not as academically prepared as full-time faculty (Leslie & Gappa, 2002). The majority of part-time faculty do not hold doctoral degrees (National Education Association Higher Education Research Center, 2007). Even if these adjunct faculty have the required academic credentials, they may not be prepared to present content in the classroom effectively. This is because they do not have as much teaching experience as full-time faculty (Landrum, 2009; Leslie & Gappa, 2002). They are also not afforded the professional development opportunities of full-time faculty (Green, 2007), nor do they have the same institutional support as full-time faculty (Landrum, 2009). Jacoby (2006) found that the percentage of part-time faculty negatively affected graduation rates. More to the point, results of Smith's (2010) study showed that retention was most highly affected by exposure to adjunct faculty from the first to the second semester. Placing ill-prepared faculty in prerequisite or first-year courses could put student success at risk.

Chapter Two

Literature Review

Research literature was retrieved through academic search engines at the University of Arkansas' Mullins Library and the University of Arkansas – Fort Smith's Boreham Library. ProQuest Direct Dissertations and Theses, WorldCat Dissertations and Theses, ERIC (Educational Resources Information Center) via EBSCO Academic Search Premier, ERIC via U.S. Department of Education, and JSTOR (Journal Storage) were accessed. Sources that were unavailable at either library were obtained through interlibrary loans. Key words and phrases used to search academic data bases included adjunct, part-time instructors, part-time faculty, contingent faculty, effective instructor, effective faculty, instructor performance, faculty performance, instructor effectiveness, faculty effectiveness, instructor quality, faculty quality, student success, faculty effects, prior knowledge, sequenced courses, student retention, student persistence, student success, and student outcomes. Some information and statistics were found in organizational websites such as the American Federation of Teachers, the American Association of University Professors, the Carnegie Foundation, the National Center for Public Policy and Higher Education, the Higher Learning Commission, the National Center for Education Statistics, the National Education Association Higher Education Research Center, and the United States Bureau of Labor Statistics.

This study compared student success between full-time and part-time faculty as measured by exam scores, grades, persistence, and acceptance into subsequent programs of study. To provide an appropriate context, student success and differences between part-time and full-time faculties were examined. The literature review includes the following topics: (a) prior knowledge

and student success, (b) student success as a measure of faculty quality, (c) differences between full-time and part-time faculty, and (d) the effects of part-time faculty on student success.

Student Success

Since student success was used in this study to determine faculty quality, an understanding of student success and how it is measured was necessary. This section of the literature review will show that student success is a product of higher education and is dependent, in part, on the knowledge that the student brings to individual classes and the effectiveness of the instructors of those courses.

Measuring Student Success

According to the California State Postsecondary Education Commission, "student success should be measured through outcomes" (2007, p. 2). There are different contexts of student outcomes in terms of success that vary from institutional achievement to personal achievement, developmental growth, success in learning content in individual courses, and postgraduate success (Mullin, 2012). Certification, board, entrance, and field exams; graduate and professional school admissions; degree completion rates; and employment are all examples of postgraduate outcomes that can be used to measure student success.

Student success can be defined by outcomes of academic achievement. This would include test scores, grades, and persistence. Persistence indicates progress toward completion of a degree. In this study, only those data related to test scores, grades, and persistence that are available to the researcher were used. Because of the lack of consistent standards that determine student success, the following studies serve as a framework to use grades, persistence, and program acceptance as outcomes to determine student success.

Grades versus completion rates can be used as learning outcomes to measure effective learning and indicate student success. Using completion rates to measure student success can result in inaccurate conclusions because students who did not actually pass a course but received failing grades could be included in the completion statistics. Fasse, Humbert, and Rappold (2009) reported that the Institutional Report group at the Rochester Institute of Technology (RIT) used passing grades, but not completion rates, as a measure of student success. The authors continued to explain that earning any score but "W" indicated that students completed the course. The grades were then used to indicate levels of learning effectiveness which measured student success. The authors outlined RIT's framework for student success to include learning effectiveness which was positively and significantly correlated with levels of student-student and student-faculty interactions, with faculty engagement in professional development, with availability of student support services, with faculty satisfaction, and with student satisfaction.

Persistence is a student outcome that can also be used to measure continued student success. Student outcome indicators for student success that were identified by the California State Postsecondary Education Commission (2007) focused on completion, educational quality, and satisfaction. These were refined to: (1) time to degree, (2) full-time to part-time student ratio, (3) first year persistence rates, (4) four-year degrees conferred for transfer students, (5) community college degrees conferred, certificates awarded and successful transfer. Persistence was directly linked to time to degree and part-time versus full-time student status in that continuous full-time enrollment led to graduation within recommended guidelines of four to five years.

In order for students to persist, they must pass gatekeeper courses and be retained into the successive semesters. Baldwin, Bensimon, Dowd, and Kleiman (2011) reported that system-level and state-level representatives from multiple states developed student success standard measures as a way to evaluate and improve institutional efforts toward student outcomes. Some of the groups involved in this endeavor also included the Cross-State Data Work Group, the Bill and Melinda Gates Foundation, and the Lumina Foundation. Some of the identified measures of student success included retention from term to term and year to year, credit levels that indicate progress, progression from developmental education into credit-level courses, and completion of gatekeeper courses within a certain period of time.

Measuring student success does not have to end with the outcomes achieved while enrolled. What the student ultimately achieves with education could also serve as an outcome to measure success. In a study of student outcomes measurements, Mullin (2012) asserted that other areas could be used to measure student learning and workforce outcomes. He also stated that student learning should be measured from the course level to the program level and should include general education outcomes such as analytical reasoning, critical thinking, quantitative literacy, etc. The author also suggested that student success could be determined after departure from college by placement rates, earnings, and licensure and certification rates (Mullin, 2012). If placement and certification rates are used as measures of student success, it follows that acceptance into competitive academic programs should also be included as a measure of success.

Prior Knowledge and Student Learning

Unfortunately, grades do not always indicate knowledge gained. Differences in student knowledge at the end of a course can exist depending on the course, its content, and its delivery.

A study from the Miami-Dade Community College system suggested that students were not necessarily prepared for the second of a sequenced course even if they passed a prerequisite course. This, however, depended on the content area. This report concluded that English and reading students were prepared to continue to the next course. However, results for math did not concur (Bashford, Miami-Dade Community College, 2000).

Student success is based on learning and is the goal of higher education. Because learning is cumulative, prior knowledge can be a potentially significant factor to student success (Hailikari & Nevgi, 2010). Knowledge can be categorized into two levels. The domain level is general information within a content area, while the topic level is information related to a specific topic within a domain. Prior knowledge, at both the domain level and topic level, influence further learning (Anderson, Schulze, & Kulikowich, 1994).

> With continued exposure to the domain, often through formal instruction, the individual typically progresses to a stage of competency. In this stage, the individual's knowledge structure is more coherent, with an increase in both breadth and depth of domain knowledge. Not only does declarative knowledge increase during the competency stage, but domain procedures become more complex and more routinely executed. Further, the competent individual's topic knowledge becomes more extensive and more closely tied to a relevant domain. (Anderson, Schulze, & Kulikowich, 1994, p. 317)

Prior knowledge is important for students to anchor or identify basic information (Shapiro, 2004). Introductory courses should provide a framework and base to build content in the same subject area. In this way, learning terminology, basic facts, and introductory concepts facilitate further learning (Thompson & Zamboanga, 2003). Hailikari and Nevgi's (2010)

research supported the importance of prior knowledge in learning. The authors explained that prior knowledge is especially important in science education because of the cumulative nature of the understanding of science. The authors also contended that academic performance in later courses would reflect prior knowledge gained and successes in earlier courses within the same subject.

Thompson and Zamboanga (2003) conducted a study to determine if prior knowledge influenced academic achievement. Data from over 400 students enrolled in Introduction to Psychology from a single university were obtained. A pretest was administered at the beginning of the semester to determine the students' prior knowledge of the course content. The researchers found a significant correlation between pre-test scores and subsequent exam performance. Other variables such as attendance and other class scores contributed to most of the variance in overall student performance, while class year and major were not significant predictors. It was determined that the pretest scores significantly predicted subsequent exam scores and the cumulative score for the course. The authors summarized their findings by iterating "individual differences in pretest performance were positively and significantly associated with every subsequent measure of course achievement" (p. 100). A limitation of this study was the lack of data concerning differences in student aptitude and possible relationships with test scores.

In an extension of their previous (2003) study, Thompson and Zamboanga (2004) reported that domain specific prior knowledge facilitated learning in successive classes within the same domain. Pretests and posttests were administered to about 350 Introductory Psychology students during a single semester. The pretests measured prior knowledge while the

posttests measured knowledge gained during the semester. The final averaged scores for the course, attendance, class, gender, and experience in other courses in the same domain were also obtained. Computer-Adaptive Placement and Support System (COMPASS) scores and American College Test (ACT) scores were used to determine general academic aptitude. The authors found that the pretest measuring prior knowledge positively and significantly predicted student performance in the course with all other variables controlled. This study determined that prior knowledge is important in predicting student learning.

The depth of domain specific knowledge also enhances student learning and success. In a study of almost 200 Organic Chemistry I students, Hailikari and Nevgi (2010) compared prior knowledge exam scores, final exam scores, and retention. A prior knowledge test was administered to measure knowledge of facts, knowledge of meaning, integration of knowledge, and application of knowledge. The authors determined that students with a deeper level of prior knowledge were more likely to complete the course and to earn better grades. The students' major was also related to the prior knowledge exam scores and final grades. The effect of major, however, was not evident when both prior knowledge and major were used in the regression model. The authors also found that there was a significant relationship between the quality of prior knowledge and grades.

Teaching Effectiveness and Successive Student Success

At any point within a student's academic career, there can be a breakdown in learning that could inhibit success. An important and accompanying factor in learning is continuous effective instruction that the student receives. Kreber (2002) averred that perceived success of students was the criteria used to evaluate teacher performance. Her article described teaching

excellence as usually based on judgments made about performance in the classroom. She also indicated that the amount of knowledge of teaching was rarely used to determine teaching excellence.

The Higher Learning Commission (2003) "makes it clear that teaching that does not lead to student learning cannot be called effective. In short, the test of teaching is the learning achieved by students" (p. 3.2-9). The Higher Learning Commission goes on to state, in Criterion Three: Core component 3b in Student Learning and Effective Teaching, *Handbook of Accreditation* that:

> Organizations providing higher learning must have qualified faculties-people who by formal education or tested experience know what students must learn-who create the curricular pathways through which students gain the competencies and skills they need. Effective faculty members understand that students learn in very different ways. (p. 3.2-10).

Differences in teaching effectiveness could indicate discrepancies between instructors and the success of their students in successive courses. Easter's (2010) research supported the notion that in hard sciences, teaching effectiveness is correlated to student success in successive courses. The authors collected data over two years from students enrolled in College Chemistry Two to assess a student's preparation for the second course of a two-semester sequence of courses. An exam was administered at the beginning of College Chemistry Two that corresponded to College Chemistry One curriculum to determine student preparation for College Chemistry Two. Data from Chemistry One was also collected regarding the institution in which the course was taken, instructor for the course, and final grade. Instructor effectiveness was

based on student evaluations. The author reported that Chemistry One instructor effectiveness, measured by instructor student evaluations, was correlated with the preparation of students for Chemistry Two. In turn, the students' level of preparation in Chemistry One significantly affected academic achievement in Chemistry Two. In essence, the effectiveness of the instructor could reflect the prior knowledge gained in a prerequisite course. This prior knowledge, in turn, could affect the student outcomes in the subsequent course.

Differences Between Part-time and Full-time Faculty

The next section in this literature review will examine the quality of instructors of lower-level, gatekeeper courses that lead to successive courses in the students' program of study. There is an increasing trend to hire adjunct faculty to fill teaching positions in higher education. Most of the teaching faculty in four-year institutions of higher education are now contingent faculty. Because many of the teaching positions are being filled with part-time faculty, there is a resulting increase in selectivity for the most highly qualified candidates for the fewer full-time openings (Schuster & Finkelstein, 2007). This could potentially result in a disparity in the quality of instructors between full-time and part-time faculty.

Preparation to Teach

Because learning to teach may occur absent of formal direction, instructors in higher education are mostly self-taught and self-regulated. Gredler (2009) paraphrased Gagne stating that, "learning can occur whether or not instruction is present" (p. 162). Gredler also stated that metacognitive skills are essential for this self-directed learning (p. 227). Fortunately, most persons in new teaching positions in college are self-aware of how to learn. A possible problem is that the zone of proximal development for college educators new to teaching may only include

perceptions of teaching from observations of more experienced faculty in the classroom. According to social-cognitive theory, other faculty who were perceived to be exemplary would be chosen as models (Gredler, 2009, p. 356). The novice professors would learn to teach using the same techniques as they observed as students. The more experienced college professors that were being modeled may not have taught the same courses that the newly hired instructor would be assigned to teach. In this case, transfer of learning would have to be applied to conform to content that would be taught. According to Gredler (2009), once learning has occurred, new knowledge could be applied in new contexts and different situations. Gredler continued to say that new knowledge would be constructed built on previous experiences as predicted by Gagne's theory of learning.

Using Gagne's conditions of learning, Gredler (2009) described the use of cognitive strategies for learning through planning, evaluation and monitoring. Because of the mostly trial-and-error method of learning how to teach is based on student success and evaluations, the learning process is constructed as described by the cognitive-development theory of the progression of intellectual development (Gredler, 2009, p. 288). At best, these would-be teachers have a mentor and learn to teach through guidance. In this case, the novice instructors may employ Gagne's guided discovery, described by Gredler (2009, p.167), in their learning process. In some cases, mentors may become involved enough to enable collaborative learning to occur typical of cultural-historical cognitive development theory (Gredler, 2009). Peers may also play a role in the learning processes of the new instructors by serving as mentors or models. This would allow a Piagetian approach to obtaining others' perspectives and create opportunities for reevaluation of teaching methods. Unfortunately, part-time faculty are often isolated from

other faculty by time or availability, by lack of office space, or by exclusion (Schuetz, 2002). Because of this lack of contact, mentoring and modeling teaching for adjuncts would be less likely to occur than for full-time faculty.

College instructors that are untrained to be teachers are ultimately responsible for developing their own instructional methods. Kreber's (2002) article on teaching excellence described postsecondary preparation for teaching as a trial-and-error learning process that occurred over time. Effective strategies would be kept in the teaching repertoire and those that do not work well would be scrapped. The author wrote that it was generally agreed that the decision to keep or dismiss a teaching strategy was based on a reasoning technique referred to as reflection. Over a period of time, through self-regulated learning, most faculty would develop a collection of strategies and approaches that would be effective. According to Kreber, the process of identifying, analyzing and solving problems over time resulted in the ability to develop even more effective problem-solving strategies.

Schuetz (2002) analyzed data from the 2000 Center for the Study of Community Colleges faculty survey of more than 100 colleges and over 1,500 faculty. Results showed that most part-time faculty reported one to four years of teaching experience while full-time faculty most often reported having 11 to 20 years of teaching experience. In this same survey, part-time faculty were three times more likely than full-time faculty to have less than one year of teaching experience, and they were two times more likely than full-time faculty to have less than five years of teaching experience. Overall, part-time faculty were less experienced and had less opportunity to gain experience through mentoring and modeling.

Training

Institutions of higher education operate under public scrutiny and are held accountable by all stakeholders to provide quality education to its students. With ever increasing numbers of adjunct faculty carrying the burden of teaching introductory and general education classes in higher education, the quality of education they provide should be assured. Allowing a constant and ever changing flow of inexperienced adjunct faculty to teach without adequate backgrounds in education should be countered with training and professional development. The Higher Learning Commission handbook of accreditation states, "Faculty are involved in defining expected student learning outcomes and creating the strategies to determine whether those outcomes are achieved" (p. 3.2-10). "Qualified faculty determine curricular content and strategies for instruction" (p. 3.2-10).

Kreber averred "that teaching excellence could be based exclusively on knowledge that teachers construct as a result of personal teaching experience" (p. 10). Most teaching is learned on-the-job. Academic positions favor candidates with teaching experience. Most new full-time faculty are hired with at least some teaching experience as graduate teaching assistants (TAs). Some institutions offer, or require, formal training for TAs. Hardre (2005) urged institutions of higher learning to provide even greater guidance to graduate teaching assistants (TAs) in teaching and learning.

Several national programs have been established to encourage the training of graduate students earning academic doctoral degrees. Adams (2002) reported that the Association of American Colleges and Universities and the Council of Graduate Schools instituted the Preparing Future Faculty Program in 1993 to prepare doctoral students for academic careers.

Through this program future faculty are trained for teaching, research, and service. As another example, teaching assistantships are not regarded as prestigious as research assistantships in colleges of science, technology, engineering, and mathematics (STEM). Graduate students may be urged to give research opportunities higher priority than time learning to teach (Austin, Campa III, Pfund, Gillian-Daniel, Mathieu, & Stoddart, 2009). The authors explained that the Center for the Integration of Research, Teaching and Learning supported by the National Science Foundation, was a national incentive to train future STEM faculty. Program objectives included "implementing and advancing effective teaching and learning practices" (p. 86).

Glaskin-Clay (2007) suggested that part-time instructors be hired, not only with subject matter expertise, but also with some knowledge of adult education theory and teaching practices. These requirements could be impractical to implement. Most adjunct faculty who have professional degrees do not have the same opportunities to work as TAs in professional schools. Outcalt (2002) charged that administrators, faculty in administrative positions such as department chairs, and full-time faculty in higher education should work toward providing developing training programs targeting part-time faculty. These professional development programs would promote instructional effectiveness and increased interactions within the institutions.

A number of training sites for adjunct faculty are now available on the internet. As an example, according to Powers (2006), a company called Adjunct Success has developed a webinar series for training adjunct faculty about teaching. Colleges pay per participant for the online training that includes topics such as incorporation of technology in the classroom and

teaching techniques. Some of the content of the webinars is customized to the institution but most information is generic.

Not only do part-time faculty have less teaching experience, they also lack experience preparing to teach. Many are given syllabi prepared by the full-time faculty. In courses that are multi-sectional, part-time faculty are not usually involved in developing student learning outcome assessments because they may not be required or even asked to participate (Smith, 2010). In summary, part-time faculty do not have the same opportunities as full-time faculty to develop effective teaching skills.

Faculty Performance

Faculty performance, or effective teaching, can play a role in student success. In a study by Reason, Terenzini, and Domingo (2006), factors that influenced student success and persistence were identified and evaluated. National Survey of Student Engagement (NSSE) data from almost 6,700 students and surveys of 5,000 faculty members from 30 four-year higher education institutions were used in this ex post facto study. No distinction was made between full-time and part-time faculty. Faculty performance was cited as three of the ten significant influences on academic competence by students.

If part-time faculty have less teaching experience, their performance could be sub-par. In a study of part-time, full-time, contingent, and permanent faculty, Baldwin and Wawrzynski (2011) suggested that faculty appointment and discipline influenced instructional methods with part-time contingent faculty using the least learning-centered techniques. Over 26,000 faculty from 1,080 institutions responded to the 2004 National Study of Postsecondary Faculty (NSOPF-04), sponsored by the U.S. Department of Education's National Center for Education Statistics

(NCES). These data were used to compare the use of subject-centered and learning-centered teaching strategies between contingent faculty and permanent faculty. The author lamented that the literature, regarding part-time teaching practices, was "somewhat contradictory and difficult to interpret" and could be due to differing instructional practices related to the various disciplines (p. 1489-1490). Overall, part-time faculty were less likely to utilize learning-centered strategies, rather than subject-centered learning, compared to full-time faculty. Results of the study indicated that, compared to full-time faculty, part-time faculty were less likely to assess student learning by testing and lessons that required greater effort and time to grade such as essay and short-answer tests, research papers, oral presentations, and group projects. Even full-time contingent faculty were much more similar to full-time permanent faculty in their teaching strategies than part-time faculty. Both part-time and full-time contingent faculty in social disciplines such as nursing, education, and psychology were the most similar in teaching strategies using less student-centered learning techniques. In these social areas, all contingent faculty were less likely than permanent faculty to use learning-centered techniques such as essay exams, short answer exams, term papers, and multiple drafts of written work. No significant differences in instructional techniques among all types of faculty were found only in the conventional academic areas that included business, economics, and finance. The author speculated that contingent faculty may have used a more narrow range of educational techniques because they did not have the expertise or time to use learning-centered methods. The author concluded that teaching differences existed between part-time and full-time faculty and among the disciplines.

In a large and more comprehensive study, Burgess and Samuels (1999) concluded that the use of part-time faculty created a serious academic quality issue. Their study used two years of student data in four pairs of sequenced math or English courses at a multi-campus community college. Student performance, based on pass rates, was compared between full-time and part-time instructors. The study concluded that pass rates in the second course were significantly higher for students who had full-time instructors in both the first and second courses than students who had part-time instructors in the first course. It was also found that students who had full-time instructors in the first course were more likely to complete the second course than students who had part-time instructors in the first course. On the other hand, the authors reported that students who had part-time instructors for both the first and second courses were more successful than expected. The authors suggested that this was because the part-time faculty were not as demanding, and that they inflated their students' grades. Lower student expectations and grade inflation are both symptoms of lowered faculty standards.

Faculty Standards

If all faculty do not hold students to the same standards, discrepancies in grades can result within the same course taught in multiple sections. One result could be grade inflation which could give students a false sense of success. Landrum (2009) investigated 361 courses from eight departments at a large, four-year university and determined that there were no significant differences in student demographics, student evaluations of teaching or distribution of grades between part-time and full-time instructors. A problem with this study is that all the data was pooled so individual differences between departments or within courses could not be identified. The author concluded that this investigation of broad data may improve external validity for

generalizability. However, data was only collected from the institution's College of Social Sciences and Public Affairs which included departments of anthropology, criminal justice administration, communication, history, political science, psychology, sociology, and social work. I would pose that the results of this study may apply to the disciplines housed in that college, but may not apply to other colleges. Also because the data was pooled, the results could mask significant differences that could be discipline or course related.

In a two-year study at a small public university, Sonner (2000) reported that lower ranked faculty gave students significantly higher grades than higher ranked faculty. After controlling for class size, subject, and class level, grades in classes taught by adjuncts were significantly higher than grades given by full-time faculty. The author explained that because of the large number of adjuncts in the study, that it was unlikely that the adjuncts are more proficient instructors. Sonner suggested that grade inflation by adjuncts result in less student complaints which can help ensure continued employment. However, this argument could also be used by full-time faculty in their pursuit of tenure. The results of this study do not support that notion.

In another study by Kezim, Pariseau, and Quinn (2005), 20 years of mean grade point averages of students from adjuncts, full-time tenured, and full-time non-tenured faculty were compared. There was no significant difference in the grades of students of full-time tenured and non-tenured faculty. The authors reported that significantly higher grades were given to students by adjunct faculty. The authors also suggested that faculty in the least secure employment positions inflated grades to maintain higher teaching evaluations. The higher numbers of adjuncts presently being used may contribute to exacerbating grade inflation in higher education.

Professional Development

Opportunities for professional development in both teaching and content could be a possible remedy for some of the noted disparities between teaching effectiveness and academic standards between part-time and full-time faculty. Using data from the 2000 Center for the Study of Community Colleges, Schuetz reported that part-time faculty were less likely to be connected to sources of information about teaching practices (2002). The author explained that because of a lack of involvement in institutional activities including administrative and committee work, part-time faculty were relatively isolated from other faculty and other colleagues. The author also found that part-time faculty were not as involved in professional organizations as full-time faculty. She suggested that these resulted in "isolation from knowledge about innovative teaching methods and campus services" (p. 42) which could be beneficial to the adjunct faculty members and their students.

Staying current in the content area is a necessity for educators in colleges and universities. Leslie and Gappa's (2002) study, that analyzed data from a survey conducted by the Center for the Study of Community Colleges and the National Survey of Postsecondary Faculty, found no statistically significant difference between the professional journals read between part-time and full-time faculty. The authors reported that full-time faculty were more likely to read discipline-based journals than part-time faculty.

Leslie and Gappa (2002) went on to report that part-time faculty were significantly less likely to receive a teaching award, engage in professional development opportunities, or attend a professional conference. Even though the institutions encouraged participation in professional

development activities, the authors suggested that part-time faculty may not have been eligible for these activities at their institution of employment.

In order to determine what support services were provided and utilized by adjunct faculty at the Oregon Institute of Technology, 102 adjunct faculty were surveyed by Bergmann (2011). A majority of adjuncts reported that they did not participate in available support services such as serving on committees, attending meetings or take part in training. These adjunct members elected not to participate because they did not perceive this type of activity would improve their teaching. This study makes it apparent that part-time faculty were unaware that professional development activities, which were required for most full-time faculty, were important to their growth as teachers.

Student Contact

If adjuncts are uninformed about professional development, they may also be unaware of the importance of student contact. Core Component 3c within Criterion Three in the *Handbook of Accreditation* emphasized the importance of effective student-faculty interactions which include classroom, out-of-classroom, and electronic environments (Higher Learning Commission, 2003). Umbach and Wawrzynski (2005) combined data from the 2003 National Survey of Student Engagement (NSSE) from over 20,000 seniors and over 22,000 freshmen, and a national survey that investigated attitudes and behaviors of over 14,000 faculty participating in NSSE. It was concluded that faculty behavior and attitudes resulted in significant effects on student learning and engagement. Faculty engagement, in and out of the classroom, positively influenced students' educational experiences and promoted active participation in learning. In

fact, the author suggested that faculty may have been the single most important influence in student learning.

Similarly, in Landrum and Lisenbe's (2008) survey of Boise State alumni to determine their perception of departmental quality and alumni satisfaction, faculty contact outside the classroom was determined to be the most important factor to predict departmental quality. The alumni reported that faculty counseling outside the classroom was a stronger predictor of quality than in-class instruction. Finally, participants in the study, by Fasse, Humbert, and Rappold (2009) at the Institutional Report group at the Rochester Institute of Technology, responded to a survey that their worst student experiences in online classes related to minimal presence of their instructor. Clearly, faculty contact is important to students.

Unfortunately, the lack of faculty-student contact outside the classroom is an issue that surrounds the use of adjunct faculty. The inadequate availability of office space for part-time faculty is usually cited for this behavior. At the Oregon Institute of Technology, 102 adjunct faculty were surveyed by Bergmann (2011). Even though 44% of the respondents reported that they would be better able to answer student questions if they had an office, one-third of adjuncts responded that they would not use an office if it was offered. Ninety percent of those respondents that also worked full-time elsewhere indicated that they would not use an office. Again, these adjunct faculty did not perceive having an office would improve their teaching. The author questioned how faculty met with students if no offices were available (Bergmann, 2011).

One might assume that part-time faculty use electronic means for student contact in the absence of an office or the perception that an office would not lend itself to improve teaching.

However, in a study of part-time, full-time, contingent, and permanent faculty, Baldwin and Wawrzynski (2011) found that part-time faculty were also less likely to interact with their students electronically than full-time faculty. The authors even suggested that part-time faculty primarily used face-to-face contact to communicate with students because part-time faculty were not using technologies, such as e-mail and websites, that were available to them. The inference is that no matter what is available to part-time faculty, that group does not maintain student contact as well as full-time faculty.

Effects on Persistence

Effects related to persistence, such as teaching effectiveness, academic standards, and student contact are concerns for institutions of higher education. In order to persist, students must be continuously successful from their freshman year until graduation. The early years can set the tone for the rest of the students' academic career. Contingent faculty are often assigned to introductory courses that can positively or negatively affect students' progress throughout their academic careers (Baldwin & Wawrzynski, 2011).

Administrative data of over 41,000 first-year, full-time students from a single Canadian university was analyzed by Hoffmann and Oreopoulos (2009) to determine if teacher quality mattered to students' achievement and interest. Results showed no significant difference between employment status of the instructor and overall dropout rates of students between the years of 1996 and 2005. The authors also came to the conclusion that there was no correlation between the employment status or perceived effectiveness of their instructor and students enrolling in subsequent courses in the same subject. There were also no significant differences in dropout rates, grades, and course selections by instructor type. Dropout rates were found to be

positively correlated to subjective student evaluation scores. The student evaluations, in turn, were positively correlated to instructor influence on the students. The authors concluded that individual instructors influenced student achievement and behavior the most during the first year, but that effect decreased over time.

In a study of just freshmen and sophomores, Ronco and Cahill 2006 compared student outcomes based on length of exposure to instructor type. Instructor types included full-time permanent faculty, adjunct faculty, and graduate teaching assistants. Retention, academic achievement, and student ratings of instruction from almost 4000 students at a single university were used as outcome variables. The authors found that attrition increased by 14% for students entering their sophomore year if they had enrolled in less than 25% of their freshman classes with full-time faculty. There was no significant difference in retention during the sophomore year. Grades, however, were significantly lower for freshmen who enrolled in 75% of their courses taught by full-time faculty. Few statistically significant differences were found in student satisfaction ratings among instructor types. Any differences noted were based on availability of faculty to students, pace of the course, and effective use of time in the classroom. The authors concluded that instructor type does not have widespread effects on student outcomes, but noted that further investigation of an association of instructor type and retention between the freshman and sophomore years should be conducted.

Persistence and student success can also be gauged by transfer rates from two-year to four-year schools. The 2010 report from The National Center for Public Policy and Higher Education and The National Center for Higher Education stated that student outcomes such as degree attainment, transfer activity, and retention were the best indicators of quality education

(Brenneman, Callan, Ewell, Finney, Jones, & Zis, 2010). Eagan and Jaeger (2009) investigated transfer rates of community college students to four-year institutions by sampling almost 25 thousand students in 107 community colleges in California and using institutional and IPEDS data. The study noted that part-time faculty were often used in introductory "gate-keeping" courses. The authors found a negative correlation between the amount of exposure to adjunct faculty and transfer rates. This could have been associated with lack of availability of students to faculty because of lack of office space and lack of institutional incentive for adjuncts to be available to students. This study contradicted Jacoby (2006) comparing adjunct usage and graduation rates using total institutional data. Jacoby's study found that the proportion of adjuncts used and the proportion of instruction by adjuncts had no significant relationship on transfer rates. The results of this study did indicate an individual effect on transfer rates of students of adjuncts and the amount of time exposed to them. Unfortunately, the researchers did not continue to follow the students to document their successes at the transfer institutions.

Persistence within a discipline is also a concern for time-to graduate and retention in individual programs, departments, and colleges. Bettinger and Long (2010) used institutional data and results from a survey from first-time, full-time freshmen from twelve public, four-year colleges in Ohio to determine the effect of adjunct faculty on subsequent students' interest and course performance compared to full-time faculty. Overall, the authors found that adjunct faculty negatively impacted students' enrollment in subsequent courses within the same discipline relative to full-time faculty. However, when looking at specific subjects, the use of adjuncts in some disciplines actually increased the interest in that discipline. Enrollment increased in the number of subsequent courses within the subject and increased the likelihood

that the student would major in that subject or discipline. The subject areas that were most affected were those associated with a specific profession and with the sciences. The author suggested that the professional experiences of the adjuncts were conducive for students to major in those professional fields.

Perception and Institutional Effects

Quality education is important to institutional reputation to market a college or university. Effective instruction by quality faculty is key to excellence in education. On campuses where student evaluations are the only assessment measured used for adjunct faculty, academic standards and motivation to learn to teach may be lacking. If faculty evaluations do not reflect the importance of academics and faculty are not rewarded for excellence in teaching, motivation may be inhibited. Without motivation and with little useful feedback or collaborative learning, limited learning may result. However, when the motivation for learning to teach is student success, the process is never ending self-regulated learning. Using this system, goals are determined, outcomes are evaluated, and behavior is regulated (Gredler, 2009, p. 371). Models can be carefully selected, personal behavior is continually assessed, and higher goals are formed. If adjunct faculty continually receive positive student evaluations, the motivation to improve may be absent.

Student perceptions of quality instruction during the freshman and sophomore years may change as the students become more seasoned. The opinions formed as a student may persist after graduation. Alumni perception is not only important to the institutional reputation but also for potential funding from donors. Landrum and Lisenbe (2008) surveyed Boise State alumni to determine their perception of departmental quality and alumni satisfaction. The alumni

consistently rated part-time faculty lower than full-time faculty in all instructional quality areas. According to the authors, the alumni reported a significant preference for full-time faculty over part-timers.

No matter the quality of instruction, adjunct faculty do not always garner high opinions concerning quality in the classroom. Part-time faculty maintain lower status because of low pay, which is about 27 % of full-time faculty salary, and lack of rank since most are hired as instructor or lecturer (National Education Association Higher Education Research Center, 2007). According to the American Federation of Teachers (AFT) Higher Education, fifty-five percent of part-time faculty reported that they were not given the same opportunities for full-time employment when they applied for an open faculty position (2010). The implication is that even the institution that has already hired the part-timer may not perceive this adjunct as good enough to be employed as a full-time faculty member.

The increasing use of part-time faculty can also result in deleterious effects on the quality of instruction from full-time faculty. Full-time faulty work longer hours because of increased use of adjuncts as there are fewer faculty to take on their other duties (Jacobs, 2004). The full-time faculty also must compensate in later courses if the part-timer delivered a poor performance. The extra time and responsibilities taken on by full-time faculty can potentially result in lower overall quality of instruction by full-time faculty (Smith, 2010).

Summary of the Literature Review

Assessing student success, which is based on learning, has become part of the criteria for accreditation for higher learning institutions. Learning is based on information acquisition that builds on previous knowledge. Exams are typical assessments used to determine if learning has

occurred. In turn, exams scores can be used to determine course grades. Consequently, a passing course grade is a positive indicator for student achievement. Persistence relies, in part, on passing grades for courses. Previous research has measured student success using these student outcomes that include exam scores, course grades, and persistence. Other outcomes, including post-graduate achievement, can also be used to measure student success.

The research cited in this literature review has shown a link between student success and teacher effectiveness. The amount of previous knowledge that a student brings to a course can affect the student's success in the course especially in the same subject area. Several studies concluded that this was especially apparent in sequenced courses in which students gain knowledge in basic content that would be used as a basis for subsequent learning.

This review of the literature showed that part-time faculty typically teach gatekeeper freshman and sophomore level courses. Compared to full-time faculty, part-time faculty have been reported to have less teaching experience and have participated in less professional development activities that support teaching. This leads to the question of the quality of part-time teachers and their effect on continuing student success.

Faculty performance has been indicated as significantly influencing academic success by students. Several studies have shown that part-time faculty are not as effective in the classroom as full-time faculty. Success in subsequent courses was also shown to be greater for students who had full-time faculty versus part-time faculty in prerequisite courses. Issues concerning academic standards and grade inflation of part-time faculty were also reported in several studies. This can negatively impact a student's later success. Another positive correlation to student success is student-faculty contact. Student contact has been cited as one of the most influential

behaviors for student learning. Again, a disparity exists between part-time and full-time faculty. Numerous studies reported that part-time faculty did not maintain contact with students outside the classroom as well as full-time faculty did.

Participation in professional development could be a possible remedy some for some of these identified problems associated with part-time faculty. Unfortunately, studies indicate that part-time faculty did not have a positive history in this area. Part-timers were unaware, did not have the opportunity, or refused to participate in activities that could have helped them become better and more effective teachers.

The longer effect of quality teaching is reflected in persistence, or continuous enrollment, to graduation. Individual courses must be successfully passed and so individual instructors play a role in persistence. Research is contradictory concerning part-time versus full-time faculty and persistence. Most of the evidence related to persistence pointed to student evaluations of faculty. No relationship was reported in faculty employment status and overall persistence, retention, or transfer rates. However, depending on the specific disciplines, students were less likely, or more likely, to enroll in subsequent courses if they had a part-time instructor in a previous course within the same discipline.

Quality of instruction becomes an issue of reputation which affects student recruitment. Part-time faculty do not receive the same level of respect or the perception of quality as full-time faculty. Institutional practices foster this because part-time faculty are typically lower paid, teach less desirable courses, work at less desirable schedules, receive little to no benefits, lack rank, and are often passed over for full-time employment. The use of part-time faculty also creates more work for the full-time faculty which can result in poorer full-time faculty

performance. When alumni were surveyed, they favored full-time faculty over part-time faculty. Alumni perceptions of the institution are significant because of potential alumni support. Overall, the use of part-time faculty has the potential to damage the reputation of the institution.

The literature review revealed issues surrounding the use of part-time faculty but questions remain. There was evidence that part-time faculty did not impact overall student success measured by persistence. Yet, when looking at student success in specific disciplines or courses, results were conflicting. Most of these studies did not distinguish between the academic qualifications of the faculty by their degrees. This study compared student success of part-time faculty and full-time faculty in a specific sequence of courses in a specific program. This novel approach only included part-time and full-time instructors with doctoral degrees.

Chapter Three

Methods

The purpose for this quantitative study was to compare the student outcomes after the successful completion of a prerequisite course taught by full-time faculty with academic doctoral degrees versus part-time faculty with professional doctoral degrees. Because retention and student success are tied to the mission of higher education and to institutional funding, employing effective faculty at entry level courses is an important institutional decision. Completion of the second course in a two-semester sequence of courses is the ultimate goal of students enrolling in the prerequisite course. A passing grade in the first course, as determined by the instructor, allows the student entrance into the second course. If students were enrolled in the first course with an instructor that did not maintain the same standards, or who was not as effective as other instructors of the same course, the outcome of the second course and persistence may be jeopardized.

Research Objectives

The research objectives for this study regarding a two-semester sequence of courses were:

1. Describe and compare participants on the variables gender, age, full- or part-time student status, major, and COMPASS/ACT scores.

2. Compare students' knowledge of the first semester course content entering the second semester course based on faculty qualifications in the first semester course.

3. Compare students' final grades from the first semester course based on instructor status.

4. Compare the second semester course completion patterns based on instructor qualifications of the first semester course.

5. Compare second semester pass rates based on instructor qualifications of the first semester course.

6. Compare second semester grade distributions based on the first semester instructor qualifications.

7. Compare acceptance rates into professional programs based on the first semester instructor qualifications.

These objectives were addressed by a comparative study of post-test data, grades, and acceptance rates into subsequent academic programs of students who were enrolled in the second of a two-semester course with the researcher, a full-time instructor at a small mid-southern university.

Population and Sampling Techniques

The target population for this study included students who were enrolled in an undergraduate course that required a prerequisite course taught by both part-time and full-time instructors. The accessible population consisted of the researcher's students enrolled in Anatomy and Physiology II (AP2), the second semester of a sequence of two courses, at a mid-southern university with a population of about 5,000 full-time students. AP2 students have passed Anatomy and Physiology I (AP1) as a prerequisite with a grade of "C" or better. Data was collected from approximately 700 AP2 students enrolled during fall and spring semesters from fall 2008 through spring 2012. Data was not collected during the spring of 2011 because of a delay in the beginning of the term from winter weather. Most students were enrolled in AP1 and AP2 as pre- or co-requisites to allied health programs such as associate degree and bachelor degree nursing, dental hygiene, surgical technology, or radiography programs. Smaller numbers

of biology majors, secondary education majors, and others also enrolled in these courses. A stratified sample of Anatomy and Physiology II (AP2) students from the accessible population, who had either full-time or part-time instructors for Anatomy and Physiology I (AP1), were selected for this ex post facto study. Stratified sampling was used to ensure each group of students was equally represented in this comparative study. This type of probability sampling enables a random selection of an equal number of participants from each subpopulation (Ary, Jacobs, & Sorenson, 2010). A random sample of AP2 students who had full-time instructors were selected using a randomizer in Microsoft EXCEL© to equal the smaller number of AP2 students who had part-time instructors.

The entire AP1 faculty included in this study had terminal degrees. Interestingly, the full-time faculty had academic degrees including Ph.D. and D.A., while the part-time faculty had professional degrees including M.D., D.V.M., and D.C. Part-time faculty were routinely assigned to teach AP1 as enrollment dictated and as full-time faculty loads were filled with upper level courses. Both full-time and part-time faculty taught day and night classes on campus. Because the same instructor taught almost all of the AP2 students, a unique opportunity became available to compare the success of students who had part-time versus full-time faculty of the first course in a sequence.

Research design

This quantitative ex post facto study attempted to determine if student success, as determined by scores, grades, persistence and program acceptance, was significantly different between full-time and adjunct faculty. Ex post facto research was indicated because the variables of this study could not be manipulated (Ary, Jacobs, & Sorenson, 2010). Because ex

post facto research does not make strong inferences about causal relationships, I focused on comparison studies. I compared success of AP2 students who had either full-time faculty with academic degrees or adjunct faculty with professional degrees in AP1.

First, I described and compared the demographics, majors, and COMPASS/ACT scores of the two groups of students. Then, I determined if there was a significant difference in performance of the students entering the second course. More specifically I assessed the level of preparation and prior knowledge that students possessed when they come into the second of a two-semester course sequence, and compared those results between full-time and part-time faculty. This included an evaluation of content knowledge of the first semester course by use of a posttest of content from the first course. AP1 final grades were also compared between full-time and adjunct faculty to determine if the students' levels of performance had been comparably measured. Measuring the effects of prior knowledge cannot be ignored when assessing for learning outcomes (Shapiro, 2004). Using pretests and posttests can be used to assess prior knowledge and previous understanding. Thompson and Zamboanga (2003) asserted that using a test for prior knowledge at the beginning of a semester can be useful to determine the depth of knowledge of a subject that the student brings to a subsequent class. The authors also averred "that by using individual differences in pretest results to predict course performance, an instructor can understand whether student achievement is influenced by preexisting differences in student knowledge and understanding" (p. 96-97).

Data from the end of the AP2 course was then used to compare the two student groups. Completion patterns of AP2 were examined for significant differences between the two groups of students. Student performance at the end of the second of a two-semester course sequence

was also compared using final course grades of AP2. Next, success of the student groups in AP2 was compared using pass/fail rates. Finally, program acceptance rates were compared between the student groups to determine if the use of adjunct faculty in a crucial prerequisite course was significantly different from the use of full-time faculty.

Instrumentation

Archival data was used in this ex post facto study. Demographic data for students and data that match students with their AP1 instructors were obtained from the Office of Institutional Research with approval by the Director of Institutional Research and the Institutional Review Boards of both the institution participating in the research and the University of Arkansas Fayetteville.

The researcher owns student pretest and posttest data. The prior knowledge AP1 posttest consisted of 50 multiple choice questions that assessed knowledge of AP1 course objectives and were predetermined by the instructor of AP2 to be necessary for the understanding of concepts in AP2. All questions were chosen from test banks supplied by McGraw-Hill publishers for *Anatomy and Physiology: A Unity of Form and Function* by Kenneth Saladin, the textbook used for AP1 and AP2 during the period of data collection.

Data Collection Procedures

Archival data was used in this study. Pretest and posttest data were collected by the researcher during the fall and spring semesters from fall 2008 through spring 2012 excluding spring 2011 due to a late start of the semester from inclement weather. AP2 students were administered a posttest to assess their content knowledge obtained from their previously completed AP1 course during the first week of classes. The same students were also given a

pretest to assess prior knowledge of AP2 content to be used to compare with posttest data administered at the end of the semester to assess content knowledge gained during the course. The AP2 pretest and posttest data were not used in this study.

Demographic data and grades earned by AP2 students were obtained from the participating institution's Office of Institutional Research. Simultaneously, students were also linked to their Anatomy and Physiology instructors coded as "full-time" or "part-time."

Research Problem

Student outcomes may be affected by achievement in previous courses. Courses taught by part-time faculty may have different student outcomes compared to full-time faculty. Consistency in learning objectives and student expectations in prerequisite courses is especially important to student success in sequenced courses. It is important to know if student outcomes differ in the second of a two-semester course sequence depending on whether they had full-time versus part-time faculty during the first course.

Constructs and/or Variables for the Study

The constructs for the dependent variables are:

1. Student performance based on content knowledge: Knowledge specific to course content were determined by scores of 0 to 100 on a common pre-test or post-test measured on a ratio scale.

2. Student completion patterns: Student retention was measured on a dichotomous nominal scale as "retained" or "withdrew."

3. Student success based on assigned letter grades: Letter grades were measured on an ordinal scale.

4. Student success based on passing grades: Completion of a specified course with a grade of "C" or better was measured on a dichotomous nominal scale as "passed" or "not passed." Student success is traditionally defined as a passing grade, which is a subjective measure based on criteria determined by individual faculty. This construct may, or may not, reflect the same level of student achievement because of different student expectations by faculty. Regardless of the content knowledge gained during a course, student success, as defined by a letter grade of "C" or better, allows students to progress in their degree programs.

5. Student success based in acceptance into a professional program: Acceptance into a professional program was measured on a dichotomous nominal scale as "accepted" or "not accepted."

Independent variables measured on a nominal scale are:

1. AP2 student who had a full-time instructor for AP1: Student successfully completed AP1 with a grade of "C" or better and was taught by a faculty member who was specifically hired to teach AP1 as a primary job assignment.

2. AP2 student who had a part-time instructor for AP1: Student successfully completed AP1 with a grade of "C" or better and was taught by a faculty member who only taught AP1 on a part-time, contingent basis.

Data Analysis by Research Objective

All data analyses were conducted using Statistical Package for the Social Sciences (SPSS) software. Analyses followed the objectives of the study. Comparisons of nominal data were tested using the Chi square test of independence. Chi square allows group comparisons on categorical or nominal dependent variables (Glass & Hopkins, 1996). Unlike the Chi square

goodness of fit test, which tests empirical versus theoretical distributions, the Chi square test of independence, or association, determines relationships between two groups (Glass & Hopkins). Comparisons of dichotomous nominal data and continuous data were tested using independent samples t-tests. Independent samples t-tests are used to determine significant differences between a nominal independent variable and a dependent interval-ratio variable (Ross, Morrison, & Lowther, 2005).

Objective one. Describe and compare participants on the variables gender, age, full- or part-time student status, major, and COMPASS/ACT scores of AP2 students enrolled in the researcher's classes during the spring and fall semesters from spring 2008 through the spring of 2012. Means and frequency procedures were used to provide descriptive statistics of the demographics and data of the participants. Chi square tests of independence were used to compare nominal student data based on instructor type. Independent samples t-tests were used to compare ratio level student data based on instructor type.

Objectives two. Compare students' knowledge of AP1 content entering AP2, and who were previously enrolled in AP1 with full-time faculty versus part-time faculty. An independent samples t-test was used to identify differences of AP1 posttest scores, measuring content knowledge of AP1, between AP2 students who had full-time AP1 instructors versus part-time instructors. By comparing the two groups of students entering AP2, differences in faculty expectations for a passing grade were evaluated.

Objective three. Compare the frequencies of students' final AP1 grades based on instructor qualifications. A Chi square test of independence was used to compare categorical student data

based on instructor type. Comparing the distribution of A's, B's, and C's awarded to students as final course grades can indicate grade inflation between instructor types.

Objective four. Compare the second semester course completion patterns based on instructor qualifications of the first semester course. A Chi square test of independence was used to identify differences in retention in AP2 between students who had full-time instructors versus part-time instructors in AP1.

Objective five. Compare the second semester passing grades based on instructor qualifications in the first semester course. A Chi square test of independence was used to identify differences in passing and failing rates of AP2 students who had full-time AP1 instructors versus part-time instructors. A comparison of pass rates assessed the difference between the two groups of students and their ability to meet the course objectives in AP2.

Objective six. Compare the second semester grade distributions based on the first semester instructor qualifications. A Chi square test of association was used to compare the grades of AP2 students who had full-time versus part-time instructors. Since grades are used to determine success in a course, this comparison determined if there were significant differences in the levels of AP2 student success based on their AP1 instructor qualifications.

Objective seven. Compare program acceptance rates of students based on instructor qualifications. A Chi square test of independence was used to compare students' acceptance rates into allied health career programs based on their AP1 instructor qualifications. Because program acceptance is partially based on successes in prerequisite classes, early preparation is crucial to the summative success essential in this competitive process.

Histograms of the sample data, boxplots, and Normal Q-Q plots, that show the distributions of data, were used to determine normality of the data. Shapiro-Wilk tests for normality and Levene's test for equality of variances were also evaluated for model assumptions for the independent t-tests using SPSS statistical package. Cohen's *d* and effect size *r* were calculated using an online calculator at: http://www.uccs.edu/~lbecker/. Yates Continuity Correction was used for all Chi square tests in which each variable had only two categories. All statistical tests were evaluated at alpha = 0.05 for statistical significance.

Human Subject Considerations

Because only archived data were used for this study, informed consent by the subjects was not necessary. Approval to obtain archived data and proceed with the study was granted through the Institutional Review Board of the participating institution and the University of Arkansas Institutional Review Board.

Summary of Methods Chapter

Student enrollment in the second course of a two-semester sequence of courses is dependent on the success in the first course. In other words, a student must pass the first course in order to be eligible to enroll in the second course. Student performance in the first course may also affect performance in the second course. The quality of faculty plays a role in student performance. The quality of part-time faculty may not be par with full-time faculty. This ex post facto study compared student success in AP2 based on the students' instructor quality in AP1 using grades, posttests, and program acceptance rates.

Chapter Four

Results

Higher educational institutions have an obligation to the students and other stakeholders to maintain standards in the classroom. American colleges and universities are increasingly relying on adjunct faculty to fill gaps in their instructional staff. Because results of previous research are conflicting, it is questionable whether the students are receiving the same quality of education from both full-time and part-time faculties. The purpose of this study was to determine if there was a significant difference between the outcomes of students based on the qualifications of their instructors.

Demographic, grades, and test score data were collected from the researcher's Anatomy and Physiology 2 (AP2) students over seven consecutive semesters from the fall of 2008 through the spring of 2012 at a small mid-southern regional university. Data were missing from the spring 2011 semester. Prior knowledge tests were given to students entering AP2 to assess their knowledge of Anatomy and Physiology 1 (AP1) by using an AP1 posttest. All other data was obtained through the participating institution's data base.

For this quantitative study, student data were compared based on the part-time or full-time status of their AP1 instructors. All AP1 instructors had terminal degrees. The full-time instructors had academic degrees, and the part-time faculty had professional degrees. The data were analyzed to meet the research objectives through quantitative methods using SPSS statistical software. Student profiles, AP1 posttest scores, AP1 grades, AP2 grades, pass rates, persistence, and subsequent acceptance into allied health programs were compared between the

two groups of students to determine if a significant difference existed based on instructor qualifications.

The results of this study are presented in several sections. The first section describes the population of students used for this study. It includes demographic data, test scores, grades, and program acceptance data. The next section compares demographic data between the two groups of students based on the part-time or full-time status of their instructors in AP1. The third section determines if there are significant differences student outcomes. The first subcategory in this section compares AP1 scores and grades based on the AP1 instructor types. The next subcategory compares AP2 student outcomes including grades and program acceptance rates for the students based on their AP1 instructors. The fourth section of the chapter specifically answers the research questions of this study. The final section summarizes the chapter.

Population Characteristics

Population Demographics

Data were collected from 436 non-repeating AP1 students, who were also first-time enrollees of AP2, of the approximately 700 students enrolled in AP2 at a small mid-southern regional university. Data were continuously collected every fall and spring semester from the fall 2008 through spring 2012 with the exception of the spring of 2011. Of this population of students, 98 were men and 338 were women. The ages of the population ranged from 18 to 59 years and averaged 24.27 years with a standard deviation of 8.05. The median age was 20.00 years. Three hundred forty-four (78.9%) of the students had full-time status while 92 were part-time students (21%). COMPASS/ACT data was incomplete. The mean COMPASS/ACT score, reported from 322 students from this population, was 22.75 (*SD* 3.829, *Mdn* = 23.00, range 12-

32). Most of the students (82.6%) were enrolled in allied health programs. The most common majors of these students were in nursing especially Bachelor of Science Nursing (BSN) and Associate Degree Nursing (ADN). Students with majors in Radiography, Dental Hygiene, and Surgical Technology were also represented. Biology majors, including both a Bachelor of Science in Biology (n = 32) and Bachelor of Science in Biology with teacher licensure (n = 14), comprised 10.5% of the AP2 student population. A few students from various other disciplines were also enrolled in AP2. These disciplines included Psychology, English, History with Teacher Licensure, Lifelong Learner. Eleven students were undeclared majors. See Table 1 for complete population demographic information of the participants in this study.

Table 1

Anatomy and Physiology 2 Student Population Characteristics by Instructor Qualifications

	Frequency			Percent		
Instructor qualification	Full-time	Part-time	Total	Full-time	Part-time	Total
Total	343	93	436	78. 7	21. 3	100.0
Sex						
Male	80	18	98	23.3	19.4	22.5
Female	263	75	338	76.7	80.6	77.5
Student status						
Full-time	269	75	344	78.4	80.1	78.9
Part-time	74	18	92	21.6	19.4	21.1
Major						
Bachelor of Nursing	138	34	172	40.2	36.6	39.4
Registered Nursing	52	15	67	15.2	16.1	15.4
Radiography	53	10	63	15.5	10.8	14.4
Dental Hygiene	36	7	43	10.5	7.5	9.9
Biology	22	10	32	6.4	10.8	7.3
Biology Education	11	3	14	3.2	3.2	3.2
Surgical Technology	6	2	8	1.7	2.2	1.8
Practical Nursing	4	3	7	1.2	3.2	1.6
Chemistry	3	2	5	.9	2.2	1.1
General Education	3	1	4	.9	1.1	.9
Middle Education	3	0	3	.9	0	.7
Childhood Education	1	1	2	.3	1.1	.5
English	1	0	1	.3	0	.2
Psychology	1	0	1	.3	0	.2
History Education	0	1	1	0	1.1	.2
Theater	0	1	1	0	1.1	.2
Lifelong Learner	0	1	1	0	1.1	.2
Undeclared	9	2	11	2.6	2.2	2.5

Population Scores, Grades, and Program Acceptance Data

Most of the students (78.7%), who passed AP1 with a grade of "C" or better, had full-time instructors for that course, while only 21.3% had part-time instructors for the same course. Of both groups of these students, 90.6% also passed AP2. Only 4.6% (n = 20) of the students

did not complete AP2. Of the 362 students who declared a major in allied health, 167 (46%) were accepted and later enrolled in allied health courses. Passing grades earned in AP1 were 118 A's, 183 B's, and 135 C's. The same students received 85 A's, 155 B's, and 155 C's in AP2. Forty-one students (9.4%) did not pass AP2 with a C or better. Four hundred twenty-five of the 436 students took both the AP1 prior knowledge test and the AP2 pretest. The mean score for the AP1 prior knowledge exam, which ranged from scores of 30 to 92, was 59.46 (*SD* = 10.701). The average score for the AP2 pretest, which ranged from scores of 18 to 70, was 41.68 (*SD* = 9.037). See Table 2 for complete information regarding population student outcomes.

Table 2

Anatomy and Physiology 2 Student Population Outcomes

Scale	Frequency	Percent
Total	436	100.0
AP1 course grade		
A	118	27.1
B	183	42.0
C	135	31.0
AP 2 course grade		
A	85	19.5
B	155	35.6
C	156	35.8
D	16	3.7
F	9	2.1
W	15	3.4
AP2 pass rate		
Pass (C or better)	395	90.6
Fail (D, F, or W)	41	9.4
Persistence		
Yes	416	95.4
No	20	4.6

Comparison of Characteristics of Sample Groups

Three hundred forty-three AP2 students (78.7%) had full-time instructors for AP1 and 93 AP2 students (21.3%) had part-time instructors for AP1. Four students in the part-time instructor group were deleted because of missing data. This reduced the total number of students who had part-time AP1 instructors to 89 for this study. In order to have more robust statistical results, an equal number of subjects (n = 89) from each group of students were used for comparisons. The 89 students who had full-time instructors were obtained using a Microsoft EXCEL© randomizer.

The typical student in this sample enrolled in AP2 (n = 178) was a 24 year old, full-time, female student majoring in Bachelor of Science Nursing. See Table 3 for more complete descriptions of the sample of AP2 students used in this study.

Table 3

Anatomy and Physiology 2 Student Sample Characteristics by Instructor Status

	Frequency			Percent		
Instructor status	Full-time	Part-time	Total	Full-time	Part-time	Total
Total	89	89	178	50.0	50.0	100.0
Sex						
Male	19	16	35	21.3	18.0	19.7
Female	70	73	143	78.7	82.0	80.3
Student status						
Full-time	74	73	147	81.3	82.0	80.3
Part-time	15	16	31	16.9	18.0	19.7
Major						
Bachelor of Nursing	34	34	68	38.2	38.2	38.2
Registered Nursing	15	14	29	16.9	15.7	16.3
Radiography	10	10	20	11.2	11.2	11.2
Dental Hygiene	6	7	13	6.7	7.4	7.3
Biology	6	10	16	6.7	11.2	9.0
Biology Education	4	2	6	4.5	2.2	3.4
Surgical Technology	1	2	3	1.1	2.2	1.7
Practical Nursing	1	1	2	1.1	1.1	1.1
Education	0	0	0	0	0	0
Other	12	9	21	13.5	10.1	11.8

Comparisons of student characteristics were conducted to ensure that the two groups of students were comparable to lead to more valid results. Table 4 describes the comparisons of characteristics between AP2 students based on their AP1 instructors' qualifications. A Chi square test of independence (with Yates Continuity Correction) was conducted to compare the number of men and women in the two groups of students. There was no significant difference in proportions of the sexes between the two groups, X^2 (1, n = 178) = .14, p = .71, *phi* = .04. A Chi square test of independence (with Yates Continuity Correction) was also performed to compare the number of full-time and part-time students in the two groups of students. There was also no significant difference between the two groups of students and their full-time and part-time student status, X^2 (1, n = 178) = 1.00, p = .84, *phi* = .015.

Table 4

Cross tabulation and Chi square analysis of Anatomy and Physiology 2 student AP1 characteristics by instructor qualifications

Variable	FT faculty	PT faculty	Total	X^2 statistic	*df**	*p***
Total	89	89	178			
Sex				.320	1	.706
Male	19	16	35			
Female	70	73	143			
Student status				.039	1	1.00
Full-time	74	73	147			
Part-time	15	16	31			
Major				.382	2	.826
Allied health	68	68	136			
Biology	10	12	22			
Other	11	9	20			

Note. FT = full-time instructors. PT = part-time instructors. *Degrees of freedom *df.* **α = 0.05 two-tailed.

Table 4 also describes the statistical results of a comparison between the two groups of students and their majors. There were 68 students in each group who declared an allied-health program as their major. Ten students who had full-time AP1 instructors declared Biology or Biology Education as their major compared to 12 students in the other group. All other majors and undeclared students were represented by 11 students who had full-time AP1 instructors versus nine students with part-time AP1 instructors. Chi square analysis reaffirmed the conformity of student groups as there was no significant difference in the proportions of their majors, X^2 (2, n = 178) = .38, p = .83, Cramer's V= .046.

An independent samples t-test was conducted to compare the ages of the two groups of students. There was no significant difference in the ages of students with full-time AP1 instructors (M = 24.98, SD = 9.037) years and students with part-time AP1 instructors (M = 24.19, SD = 7.577; t (176) = .629, p = .53, two-tailed). The magnitude of the differences in the means (mean difference = .79, 95% CI: -1.68 to 3.25) was small (Cohen's d = .09).

See Table 5.

Table 5

Independent Samples t-test Comparison of Anatomy and Physiology 2 Students by Instructor Qualifications

	AP2 Student Characteristics					
Variable	*n*	*M*	*SD*	*t*	*p**	*d***
Age of student				.629	.530	.09
FT instructor	89	24.98	9.037			
PT instructor	89	24.19	7.577			
COMPASS/ACTscore				.808	.421	.15
FT instructor	61	23.30	3.348			
PT instructor	60	22.72	4.461			

Note. FT = full-time instructor. PT = part-time instructor. *α = 0.05 two-tailed. **Cohen's *d.*

COMPASS/ACT data received from the participating institution was incomplete. However, of the two groups of 89 students, 61 scores were available from students who had full-time AP1 instructors, and 60 scores were available from students who had part-time AP1 instructors. An independent samples t-test was conducted to compare COMPASS/ACT scores of the two groups of students. There was no significant difference (t (121) = .81, p = .42, two-tailed) between the students with full-time AP1 instructors (M = 23.30, SD = 3.35) and students with part-time AP1 instructors (M = 22.72, SD = 4.46). The differences in the means (mean difference = .58, 95% CI: -.84 to 2.00) was small (Cohen's d = .15). See Table 5.

Some statistical comparisons, such as independent samples t-tests, assume a normal distribution and equality of the variances of the data. Levene's test confirmed equality of variances for both age and COMPASS/ACT scores. Results of a Shapiro-Wilk test for normality did not support a normal distribution of either the students' ages or their COMPASS/ACT scores. See Table 6. However, histograms of the sample data, boxplots, Normal Q-Q plots indicated that the distributions of the data were reasonably normal. See Appendices A through C.

Table 6

Model Assumptions for t-tests Comparing Anatomy and Physiology 2 Students' Compass/ACT scores and test scores

	Shapiro-Wilk test for normality		*Equality of variances*	
Source	*W*	*p**	*F*	*p**
Age in years	.730	.000	4.246	.041
COMPASS/ACT	.991	.044	5.789	.018

Note. *α = 0.05.

Comparisons of Student Outcomes

Student outcomes can be interpreted as test scores, course grades, and subsequent achievement. Data from 178 Anatomy and Physiology 2 (AP2) students, who passed Anatomy and Physiology 1 (AP1) with a grade of C or better, were compared based on their instructors' qualifications. Posttest scores and final course grades for AP1 were compared. Pretest scores, final course grades, pass rates, and persistence in the subsequent course, AP2, were also examined. Finally, allied-health students' subsequent program acceptance rates were compared.

Most of the students received B's from their AP1 instructors (38.2% overall). Full-time instructors gave fewer A's (30.3%) than B's (34.8%) and C's (34.8%). However, part-time instructors gave mostly B's to their students (41.6%), and awarded more A's (32.6%) than C's (25.8%). Subsequently, in AP2, only 21.9% of all students in the sample received A's, while the percentage of B's and C's were very similar at 34.8% and 34.2% for full-time and part-time AP1faculty respectively. Within this sample, 23.6% and 20.2% of the students (with full-time versus part-time AP1 instructors respectively) received A's, 30.3% and 39.3% received B's, and 34.8% and 33.7% received C's. A total of 9.0% of the students, made a D, F, or W (withdrew). See Table 7.

Table 7

Anatomy and Physiology 2 Student Sample Grades by Instructor Qualifications

Instructor qualification	Frequency			Percent		
	Full-time	Part-time	Total	Full-time	Part-time	Total
Total	89	89	178	50	50	100
AP1 course grade						
A	27	29	56	30.3	32.6	31.5
B	31	37	68	34.8	41.6	38.2
C	31	23	54	34.8	25.8	30.3
AP 2 course grade						
A	21	18	39	23.6	20.2	21.9
B	27	35	62	30.3	39.3	34.8
C	31	30	61	34.8	33.7	34.3
D	7	1	8	7.9	1.1	4.5
F	3	1	4	3.4	1.1	2.2
W	0	4	4	0	4.5	2.2

Pass rates differed somewhat from overall persistence. Ninety-one percent of all students passed AP2. Only 6.7% of the total sample of students did not make a C or better in the course. Of the students who had full-time AP1 faculty, ten (11.2%) stayed until the end of the AP2 course earning D's and F's. Of the AP2 students, who had part-time AP1 instructors, only two (2.2%) made D's and F's and 4.5% withdrew. Three students, who had full-time AP1 instructors, did not pass AP2 and either failed with an F or dropped out. Five students, who had part-time instructors, did not pass AP2 and either failed with an F or withdrew from the course. See Table 8.

Table 8

Anatomy and Physiology 2 Student Sample Outcomes by Instructor Qualifications

Instructor qualification	Frequency			Percent		
	Full-time	Part-time	Total	Full-time	Part-time	Total
Total	89	89	178	50	50	100
AP2 pass rate						
Pass (C or better)	79	83	162	88.8	93.3	91.0
Fail (D, F, or W)	10	6	16	11.2	6.7	9.0
Persistence						
Yes	86	84	170	96.6	94.4	95.5
No	3	5	8	3.4	5.6	4.5

AP1 Posttest (Prior Knowledge Exam)

An AP1 posttest was administered to students entering AP2 to determine the knowledge of AP1 content. An independent samples t-test was conducted to compare AP1 posttest scores between students who had full-time versus part-time AP1 instructors. There was no significant difference in mean scores for AP1 content knowledge between students with full-time AP1 instructors (M = 59.82, SD = 11. 40) and students with part-time AP1 instructors (M = 59.60, SD = 10.44; t (176) = .14, p = .89, two-tailed). The magnitude of the difference in the means (mean difference = .225, 95% *CI*: -3.01 to 3.46) was small (d = .02). See Table 9.

Table 9

Comparison of AP2 Students' Test Scores by Instructor Qualifications

	AP2 Student Test Scores					
Variable	*n*	*M*	*SD*	*t*	*p**	*d***
AP1 posttest score				.137	.891	.02
FT instructor	89	59.82	11.404			
PT instructor	89	59.60	10.441			

Note. FT = full-time AP1 instructor. PT = part-time AP1 instructor. *α = 0.05 two-tailed. **Cohen's *d.*

Model assumptions for a t-test include a normal distribution of the data and equality of variances. The model assumption for normality of AP1 posttest scores was not met by a Shapiro-Wilk test, but the model assumption for equality of variances could not be rejected as determined by the Levene's test. See Table 10. A subjective determination was made to establish reasonable normality using a histogram, boxplot, and a Normal Q – Q plot. See Appendices D through F.

Table 10

Model Assumptions for t-tests Comparing Anatomy and Physiology 2 Students' Test Scores

	Shapiro-Wilk test for normality		*Equality of variances*	
Source	*W*	*p**	*F*	*p**
AP1 posttest	.992	.016	.749	.388

Note. *$\alpha = 0.05$

AP1 Final Grades

The distribution of final AP1 course grades was compared using a Chi square analysis based on AP1 instructor qualifications. AP1 students who had full-time instructors earned 30.3% A's, 34.8% B's, and 34.8% C's in the class. AP1 students who had part-time instructors earned 32.6% A's, 41.6% B's, and 25.8% C's in the class. There were no statistically significant differences between the proportions of A's, B's, and C's, that were assigned by the two groups of instructors X^2 (2, n = 178) = 1.79, p = .41, Cramer's V = .10. See Table 11.

Table 11

Cross Tabulation and Chi Square Analysis of Anatomy and Physiology Students' grades by instructor qualifications

Variable	FT faculty	PT faculty	Total	X^2 statistic	*df**	*p***
Total	89	89	178			
AP1 Grade				1.786	2	.409
A	27	29	56			
B	31	37	68			
C	31	23	54			
AP2 Grade				2.279	3	.516
A	21	18	39			
B	27	35	62			
C	31	30	61			
DFW	10	6	16			

Note. FT = full-time instructors. PT = part-time instructors. *Degrees of freedom *df.* **α = 0.05 two-tailed.

AP2 Final Grades

The distribution of AP2 grades listed respectively for students who had full-time versus part-time AP1 instructors were A's (53.8% and 46.2%), B's (43.5% and 56.5%), C's (50.8% and 49.2%), and DFW's (62.5% and 37.5%). A Chi square test for independence determined that there was no significant difference between the AP2 grade distributions based on full-time and part-time AP1 faculty, X^2 (3, n =178) = 2.279, p = .52, *phi* = .113. See Table 10.

AP2 Pass Rates

A grade of C or better is considered a passing grade in anatomy and physiology as it is a requirement for most of the anatomy and physiology students in their programs. An 88.8% pass rate of AP2 students, who had full-time AP1 instructors, was compared to a 93.3% pass rate of AP2 students who had part-time AP1 instructors. A Chi square test for independence (with Yates Continuity Correction) indicated no significant difference in AP2 pass rates between

students who had full-time AP1 instructors and students who had part-time AP1 instructors, X^2 (1, n = 178) = .62, p = .43, *phi* = -.08. See Table 12.

Persistence in AP2

The number of students that failed AP2 with an F or did not finish AP2 was small for both groups of students (n = 8). Chi square test for independence (using Fisher's Exact Test) indicated that there was no significant difference in persistence rates between the two groups of students in AP2 based on AP1 instructor status, X^2 (1, n = 178) = .52, p = .72, *phi* = .05. See Table 12.

Allied Health Program Acceptance Rates

A majority of the students in this study declared majors in allied health programs (n = 137). Of these students who had full-time AP1 instructors, 46.3% were accepted into an allied health program compared to 52.9% of students who had part-time AP1 instructors. A Chi square test for independence (with Yates Continuity Correction) indicated no significant difference between the acceptance rates of the two groups of students, X^2 (1, n = 137) = .36, p = .55, *phi* = .07. See Table 12.

Table 12

Cross Tabulation and Chi Square Analysis of Anatomy and Physiology 2 Students' Outcomes by Instructor Qualifications

Variable	FT faculty	PT faculty	Total	X^2 statistic	*df**	*p***
Total	89	89	178			
Pass Rate				.618	1	.432
Pass	79	83	162			
Fail	10	6	16			
Persistence				.524	1	.720
Yes	86	84	170			
No	3	5	8			
Program acceptance				.594	1	.496
Yes	31	36	67			
No	37	33	70			

Note. FT = full-time instructors. PT = part-time instructors. *Degrees of freedom *df.* **α = 0.05 two-tailed.

Results Related to Research Questions

This study attempted to determine if a significant difference existed between student outcomes based on the qualifications of their instructors. Data were collected from students who had previously enrolled in a common course that had either a full-time instructor or part-time instructor. Statistical analyses of this data, using Chi square tests and t-tests, were used to address the following research questions:

1. Was there a significant difference between Anatomy and Physiology II (AP2) students who had full-time faculty with academic degrees or adjunct faculty with professional degrees in Anatomy and Physiology I (AP1)?

    a. What were the profiles of the two student populations? Compare data, demographics, majors, and COMPASS/ACT scores.

There were no statistically significant differences in sex, full-time or part-time student status, major, age, and COMPASS/ACT scores between the AP2 students based on instructor qualifications in AP1. The effect size measured for age was small (d = .09) as was the effect size for COMPASS/ACT scores (d = .15). See Tables 4 and 5.

b. Was there a significant difference in the performance of students, based on AP1 posttest scores and instructor qualifications?

There was no statistically significant difference in the AP1 posttest scores based on instructor qualifications. The effect size was for the difference in the means of the scores was very small (d = .02). See Table 9.

c. Was there a significant difference between the AP1 final grades based on instructor qualifications?

There was no statistically significant difference between the AP1 final grades based on instructor qualifications. See Table 11.

2. Was there a significant difference in AP2 completion patterns based on AP1 instructor qualifications?

There was no statistically significant difference in AP2 completion patterns, as analyzed using persistence rates in AP2, based on AP1instructor qualifications. See Table 12.

3. Was there a significant difference in completion rates and final grades for students completing AP2 based on AP1 instructor qualifications?

There was no statistically significant difference in completion rates and final grades, as analyzed using pass rates, for students completing AP2 based on AP1 instructor qualifications. See Tables 11 and 12.

4. Was there a significant difference between the successes of AP2 students based on AP1 instructor qualifications?

There was no statistically significant difference between the successes, as analyzed using the final AP2 grade distribution, of AP2 students based on AP1instructor qualifications. See Table 11.

5. Was there a significant difference in acceptance rates for students in their programs of study based on AP1 instructor qualifications?

There was no statistically significant difference in acceptance rates for students in allied-health programs based on AP1 instructor qualifications. See Table10.

Summary of Results Chapter

Because quality of education is the mission of higher education, this study attempted to determine if a statistically significant difference existed between student outcomes based on instructor qualifications. Data was compared between students, who had either full-time or part-time instructors in the first semester of a two-semester sequence of anatomy and physiology. Demographic data between the two sample groups of students did not differ statistically. Course grades and posttest scores were not statistically different for the first semester course based on their instructor. There were also no statistically significant differences in the subsequent course's pass/fail rates, retention, and final course grades. Finally, there were no differences between the two groups of students' acceptance rates into subsequent allied health programs based on their instructors' qualifications for the first anatomy and physiology course. In essence, no statistically significant differences were found between the two groups of students based on instructor qualifications.

Chapter Five

Conclusions, Recommendations, and Discussion

One of the criteria for accreditation in higher education is evidence of student learning (Higher Learning Commission, 2003). Clearly, institutions of higher education are concerned about the quality of education they deliver. It is essential to these organizations that qualified faculty are hired and maintained to fulfill this priority. The increasing use of temporary, part-time instructors calls for assurances that the quality of education is not being compromised because of this practice. The purpose of this study was to examine the use of adjunct, part-time, faculty in a single course at a small mid-southern university to provide evidence that a difference between students' successes based on instructor qualifications did, or did not, exist. This chapter will include a summary of the study, conclusions drawn from the analyses of the data collected during this study, recommendations, and a discussion based on the conclusions of this study.

Summary of the Study

Adjunct faculty are increasingly being used to teach lower level courses in higher education institutions (Green, 2007; Jacobs, 2004; Monks, 2009). Many of these courses provide a base of knowledge that will be required for subsequent courses. The students may be at a disadvantage when they proceed to subsequent courses, or when they apply to programs that require that specific level of proficiency, if they have not had an effective instructor. It is uncertain whether part-time faculty deliver the same quality of education as full-time faculty. The purpose of this study was to determine if there was a significant difference in student success between full-time faculty with academic doctoral degrees and part-time faculty with professional doctoral degrees.

Student success, such as retention and graduation, are products of the students' educational experiences and are influenced by their instructors' effectiveness. These successes are used as accountability measures that determine funding formulas in higher education. Accountability in higher education requires informed and responsible hiring practices to ensure quality teaching. The increasing use of part-time faculty in higher education is questionable because of conflicting results of previous research regarding their quality. One problem is that many studies are too broad and do not isolate characteristics of the faculty for comparison (Bettinger & Long, 2010). This study focused on a specific course taught by full-time faculty with academic doctoral degrees and the part-time faculty with professional doctoral degrees. The significance of this study is to assist with institutional hiring practices.

This study compared success of students who had either full-time or part-time instructors during Anatomy and Physiology 1(AP1), a prerequisite course for Anatomy and Physiology 2 (AP2) and allied health programs. Student success was measured by exam scores, grades, and subsequent acceptance into allied health programs. The target population included the researcher's approximately 700 AP2 students at a small regional mid-southern university. Seven semesters of archival data for 178 students from fall 2008 through spring 2012 (excluding spring 2011) were used in the quantitative study. Institutional data such as student characteristics and final course grades, as well as the researcher's AP1 posttest scores, were used. Analyses of student success indicators subsequent to AP1 were also evaluated to determine if there were statistically significant differences between students who had full-time or part-time AP1instructors. All data were compared based on the qualifications of the students' AP1 instructors.

Question one of this study asked if there was a difference between the two AP2 student groups based on their AP1 instructor qualifications. The first part of this question focused on the student profiles. Chi square analyses and independent samples t-tests were used to determine if there were significant differences in sex, age, part-time or full-time student status, major, or COMPASS/ACT scores between the two groups of students. All data analyses indicated that there were no statistically significant differences in sex, age, part-time or full-time student status, major, or COMPASS/ACT scores. Both groups of students could be mostly characterized as a 24 year old, female, full-time student majoring in nursing, with an entering COMPASS/ACT score of 23.

Part two of question one asked if there was a significant difference between the performances of the two student groups, based on AP1 posttest scores and instructor qualifications. Independent samples t-tests were used to compare AP1 posttest scores between the two groups of students to determine if there was a statistically significant difference in student performance in AP1 based on instructor qualifications. There was no significant difference in AP1 posttest scores between the two groups of students.

The third part of question one asked if there was a significant difference between the frequencies of AP1 final grades based on instructor qualifications. Independent samples t-tests were used to assess statistically significant differences between the distributions of AP1final course grades based on instructor qualifications. There was no significant difference in the AP1 grade distributions between the two groups of students.

Question two asked if there was a significant difference between AP2 completion patterns based on instructor qualifications. Chi square analysis was used to determine if there

was a statistically significant difference in the completion patterns, based on retention in AP2, between the two groups of students. There was no significant difference in the persistence rates in AP2 between the two groups of students. Student attrition was low for both groups of students during AP2.

Question three asked if there was a significant difference between completion rates and final grades for students completing AP2 based on instructor qualifications. Chi square analysis determined there was no statistically significant difference in completion of AP2, based on pass rates, between the two groups of students.

Question four asked if there was a difference between the successes of AP2 students based on AP1 instructor qualifications. Final AP2 course grades were evaluated, using Chi square, to determine if there was a statistically significant difference in the distributions of letter grades based on AP1 instructor qualifications. No statistically significant difference was found in the AP 2 grade distributions of the two groups of students.

Question five asked if there was a difference between acceptance rates for students in their programs of study based on AP1 instructor qualifications. Chi square analysis determined that there was no statistically significant difference in the acceptance rates to allied health programs between the two groups of students.

Conclusions

Based on the results of this study, the following conclusions can be made regarding part-time faculty with professional doctoral degrees compared to full-time faculty with academic doctoral degrees:

1. Students do not preferentially choose their instructors based on qualifications. There was no distinction between students who enroll in courses, and subsequently earn a "C" or better, based on instructor qualifications. The implication is that specific groups of students do not choose specific types of instructors. This could indicate that students do not stereotype their instructors based on their full-time or part-time status. Stereotyping leads to bias which can influence students in their choice of classes.

2. Part-time instructors are as effective as full-time instructors. There was no significant difference in posttest scores based on instructor qualifications. Many part-time faculty are professionals concurrently working outside of academia. Practicing professionals may have an expectation of a certain level of proficiency in a course that leads students to a related or supporting field of practice. This may be especially true in health care where competence of co-workers is a must.

3. Adjunct faculty do not inflate grades any more than full-time faculty. The distribution of grades was not significantly different based on the instructors' qualifications. Adjunct faculty are evaluated for rehire primarily through results of student evaluations. Because of this, it has been speculated that these instructors inflate their grades (Sonner, 2000). Part-time instructors, who are also practicing doctors in various human and animal health care settings, may not have the same economic pressures to appease students to ensure good student evaluations for rehire.

4. There is no relationship between persistence and exposure to part-time faculty. There was no significant difference in persistence in a subsequent class based on faculty qualifications. Students of part-time faculty do not drop out of subsequent classes any more often than students of full-time faculty. Student-faculty interactions are linked with persistence. Students may feel

well connected to their part-time faculty who are actually practicing in the field. Practicing doctors can share real-life experiences and examples that can enhance the learning experience.

5. Students of part-time faculty are just as likely to pass a subsequent class as students of full-time faculty. There was no significant difference in pass rates of a subsequent class based on instructor qualifications of a prerequisite class. As long as the students enter a course adequately prepared in a prerequisite course, they should be successful in the subsequent course.

6. Part-time instructors prepare students for subsequent courses as well as full-time instructors. There were no significant differences in grade distributions of students in a subsequent class based on the instructor qualifications of the prerequisite class. Students who are equally prepared by full-time and part-time instructors to enter subsequent courses would be expected to have the same grade distributions at the end of the course.

7. Having a part-time instructor in a critical prerequisite class does not influence acceptance into subsequent programs. There were no significant differences in acceptance rates based on instructor qualifications for a required course. As long as grade distributions in the prerequisite classes do not differ based on instructor qualifications, all students should be on equal footing for selection into allied health programs. Also, admissions committees apparently did not exhibit bias against students previously enrolled in classes taught by part-time faculty.

Recommendations for Practice

The results of this study were contrary to what seemed obvious. On the surface, part-time faculty might be expected to be inferior as effective teachers compared to full-time faculty. Hiring practices would lead one to believe that exceptions were being made to hiring the most qualified instructors. Gappa and Leslie (1993) went on record to say, “Recruitment for part-time

faculty is usually informal and left up to the department chairs to handle as they see fit" (p. 147). Part-time faculty are many times hired on an as-need basis and the only requirement for employment is to meet minimum qualifications (Benjamin, 2003). On the other hand, full-time faculty go through a competitive and rigorous application and hiring process that includes a teaching demonstration to employ the most qualified applicant.

According to the results of this study, there were no statistically significant differences in student successes based on faculty qualifications. This study was limited to a sequence of anatomy and physiology courses which primarily served as prerequisites to allied health programs such as nursing, radiography, dental hygiene, and surgical technology. All of the AP1faculty had terminal degrees. Full-time faculty had academic degrees that included Doctor of Arts and Doctor of Philosophy in Biology. The part-time AP1 faculty possessed doctoral degrees in their professions, such as Doctor of Medicine, Doctor of Veterinary Medicine and Doctor of Chiropractic Medicine. All of the part-time instructors were also concurrently working in health care. The results of this study suggest that the practice of hiring part-time instructors with professional doctoral degrees in health can be continued for anatomy and physiology sequenced classes without concern for differences in student successes in subsequent course and programs.

Recommendations for Research

According to the results of this study, there was no statistically significant difference in student successes between two groups of students based on instructor qualifications. In this study, all faculty possessed terminal degrees. Full-time faculty had academic degrees, while part-time faculty had professional degrees in health-related fields. Results may differ if other

levels of degrees are compared. Previous research that concluded a statistically significant difference in student success existed between full-time and part-time faculty did not differentiate between degree levels of the faculty. It is also unknown if part-time instructors who have terminal academic degrees in the same discipline but unrelated to human anatomy and physiology (such as in microbiology, ecology, or botany) would have had the same results.

A follow-up qualitative study could provide more insight on the results of this research. Comparing the attitudes, expectations of student performance, teaching methods, and perceived roles of the instructors could help explain why no differences were found in student successes based on their instructors' qualifications.

Another line of research could investigate the level of cooperation between part-time and full-time faculty. The degree of communication that occurs between these two groups could affect the results of comparisons of their students' outcomes.

One of the limitations of this study was the inclusion of only one institution's data. Results would be more valid if this study was repeated for the same course sequence at multiple institutions. Increasing the number of AP1 instructors and student participants would also increase the validity of the study.

The study could also be used to examine other disciplines especially in the vocational and technical areas where adjuncts and full-time faculty are similarly degreed.

Observations, Implications, and Discussion

The framework for this study was built on concepts that link faculty to student success and on differences between full-time and part-time faculty. According to Leslie and Gappa (2002), most part-time instructors do not hold doctoral degrees and so are not as academically

prepared as full-time faculty. Even part-time instructors with doctorates are still not as experienced in the classroom as full-time faculty (Landrum, 2002). Other research came to conclusions that students of part-time faculty also have lower retention and graduation rates (Jacoby, 2006; Smith, 2010). Interactions with faculty both in and out of the classroom play a role in student learning and persistence (Terenzini & Reason, 2005). The conceptual framework paints a picture of part-time instructors as poorer performing and less effective faculty. The results of this study oppose this conceptual framework as it pertains to the negative influences of part-time faculty to student success.

This study compared students who had full-time instructors with academic doctoral degrees versus part-time instructors with professional doctoral degrees in AP1, a prerequisite course for AP2 and required for all allied health programs. Analysis of all data collected for this study indicated that there were no statistically significant differences in the students' profiles or their successes based on their AP1instructors' qualifications. Success was measured by exam scores, final course grades, pass rates, persistence, and program acceptance rates. Comparisons of AP1 posttest scores and final course grades determined no statistically significant differences in student outcomes for AP1 based on the AP1 instructor qualifications. There were no statistically significant differences in persistence, pass rates, and final grades for AP2, the course that followed AP1. There were also no statistically significant differences in subsequent allied health program acceptance rates between the two groups of students based on their AP1 instructor qualifications.

Students choose specific sections of classes for a number of reasons. For instance, students may enroll in a specific class because of the time that the class is offered. Previous

research has indicated that many part-time instructors typically teach at odd times. This may result in different demographics of students filling the classrooms of part-time instructors compared to full-time instructors. An example would be nontraditional students, who are employed full-time, enrolling in night classes primarily taught by part-time faculty. Both part-time and full-time instructors at the participating institution for this study taught similar schedules. Many students at the participating institution did not have a choice as to which section of the AP1 course they could enroll in because of the limited availability of seats. It is possible that this may have resulted in equivalent groups of students enrolling with full-time and part-time faculty.

On the other hand, students may choose a particular class because of instructor preference. Some students may choose to take a class taught by a particular instructor because of the perception that the instructor is a more effective teacher. Other students might select a class because the instructor might be considered easier. In competitive programs, where grades are a consideration for acceptance, getting higher grades may be a greater incentive for choosing a class than learning the content. Part-time instructors have the reputation of not being as difficult as full-time instructors. At the same time, part time faculty are also thought to not be as effective as full-time faculty. Because the student profiles of the two groups of students were essentially the same, a lack of bias for a specific demographic of student choosing an instructor based on qualifications could be implied.

As will be noted later in this section, some studies ignored identification of possible disparities in the student profiles when comparing full-time and part-time faculties. Instead, the research was focused on the dissimilarities between the two groups of instructors. In some

studies, the researchers simply grouped the faculty by qualifications based on employment status. Inequalities in student profiles could account for much of the research that has concluded part-time faculty are not on par with full-time faculty. Whatever the reason for the lack of differences between the two groups of students in this study, results of the study were more robust because the two student groups were comparable.

Research has previously suggested that part-time instructors are not as effective teachers as full-time instructors. The fact that the scores of the AP1 posttest were not significantly different implies that the two groups of instructors covered the concepts of AP1 to a similar degree. Communication and cooperation between the groups of instructors could account for this. Alignment of course content and depth of coverage could be occurring. If part-time and full-time instructors are using a common syllabus, a more equivocal presentation of material of the two groups is more likely. Additionally, if part-time instructors are being mentored by full-time faculty, even if on an informal level, there is a greater possibility of conformity between the two groups of instructors.

Not only were the part-time instructors effective, they also graded similarly to the full-time faculty. Grade inflation is an issue in higher education, but it is especially troublesome when students are not assigned grades using similar standards. The majority of the students, who were participants in this study, were working toward application to allied health programs such as nursing, radiography, and dental hygiene. These programs are highly competitive and selective. Acceptance into the allied health programs at the participating institution is based, in part, on grades. Grades in specific courses are specifically targeted for consideration for entrance into these highly competitive programs. AP1 and AP2 are two of those courses. When

an instructor assigns an "A" that has been inflated, relative to other instructors, students are unfairly judged and can ultimately be unfairly selected for acceptance into a program.

The results of this study contradict previous research that part-time faculty inflate grades. Kezim, Pariseau and Quinn, (2005) compared mean GPA's of students based on instructor qualifications. They concluded that part-time instructors inflated their grades because overall GPA's of their students were higher than students who had more full-time faculty. A problem with their study is that student profiles were not compared based on their instructor type. At many institutions, part-time faculty are assigned schedules that include mostly night classes which contain a different demographic of students which could skew the results of the research.

On the other hand, results of the present study agreed with the results of Landrum's 2009 comparison of grade distributions between part-time and full-time faculty. The author compared student demographics and grade distributions based on instructor qualifications. No significant differences of student profiles or their assigned grades were reported between part-time and full-time faculty.

Hailikari and Nevgi (2010) determined that there is a significant relationship between the quality of prior knowledge and grades. Based on the results of the comparisons of prior knowledge, it is evident that both groups of students came into AP2 on the same footing. However, other research has linked lingering negative effects of part-time faculty to student success.

Results of this study determined there was no statistically significant difference in completion patterns of AP2, based on pass rates, between the two groups of students. This conflicts with the results of Burgess and Samuels (1999). These authors concluded that pass

rates in English and Math were significantly higher for students who had full-time instructors versus part-time instructors in a previous prerequisite course. The authors also found that persistence was higher in the second course if students had full-time instructors in the previous course. However, their study was too broad. Neither student nor instructor profiles were compared based on their instructor type. There could be too many variables, that remain unaccounted, to make valid comparisons. Additionally, these results may not apply to courses outside of English and Math. However, the results of this study agree with Hoffmann and Oreopoulos (2009), who determined there was no significant difference in dropout rates based on instructor qualifications.

The results of this study also found no statistically significant difference in the AP 2 grade distributions of the two groups of students. Easter (2010) determined that, in sequenced courses, instructor effectiveness in the first course significantly affected student success in the following course. Because grade distributions were not significantly different between the two groups of instructors in the present study, the implication is that the part-time instructors are as effective as the full-time instructors preparing AP1 students for AP2.

It is also notable that the students enrolled in the course from which data were collected were completing requirements for highly competitive programs in allied health. These motivated students were mostly older with an average age of 24, which is usually associated with more maturity and more responsibility than traditional freshmen. Motivated students may learn despite faculty qualifications.

The results of this study contradict the majority of previous research denigrating part-time faculty in higher education. At least for courses in anatomy and physiology, student

outcomes of part-time faculty with professional doctoral degrees in health care were no different than student outcomes of full-time faculty with academic doctoral degrees. Many researchers have previously concluded that part-time instructors are not as effective as full-time faculty. However, practicing professionals may have an advantage to connect with students in their area of expertise. Especially in freshman level courses, expertise in a specialty of the discipline and research experience is not as critical as it would be to upper level courses.

Faculty can be, and are, assigned to teach courses as long as that instructor has the required credentials. In high-enrollment freshman level courses, such as an introductory biology or an anatomy and physiology course, any type of biology instructor can be placed to teach that class to fill teaching loads or as needs dictate. Botanists, microbiologists, ecologists, and other specialists can end up teaching these courses. Having an expert who actually uses the content of a course in their daily practice can add interest and relevance to the content resulting in more effective teaching.

More than the possession of a specific degree has to be taken into consideration when hiring faculty to teach specific courses. Teaching experience and knowledge of the discipline are essential for effectiveness in the classroom that results in student learning. However, passion for teaching and passion for the subject are also important in the classroom and can translate into positive student outcomes. Part-time instructors, who are in high-paying professions in health, teach because they have that passion to reach students regardless of the pay. These part-time instructors also have experience in their fields that can provide examples and insights to enhance the learning experiences of the students. Bettinger and Long (2010) reported, that in some subjects, the use of adjuncts can actually increase the interest in that discipline. Passion can be

contagious which is especially important during those first crucial semesters of a student's academic career when attrition is the highest.

Chapter Summary

Indicators of student success were compared between full-time with academic doctoral degrees and part-time instructors with professional doctoral degrees. The results of this research concluded that there were no statistically significant differences in student success at the end of the course taught by these instructors. Subsequent student success indicators were also compared based on the students' instructor in the previous course. Again, there were no statistically significant differences between subsequent student success and instructor qualifications. After a brief discussion of the implications of these conclusions, recommendations were made for practice and for further research.

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Appendix A

Figure 1: Histogram of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores

Figure 1. Histogram of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores

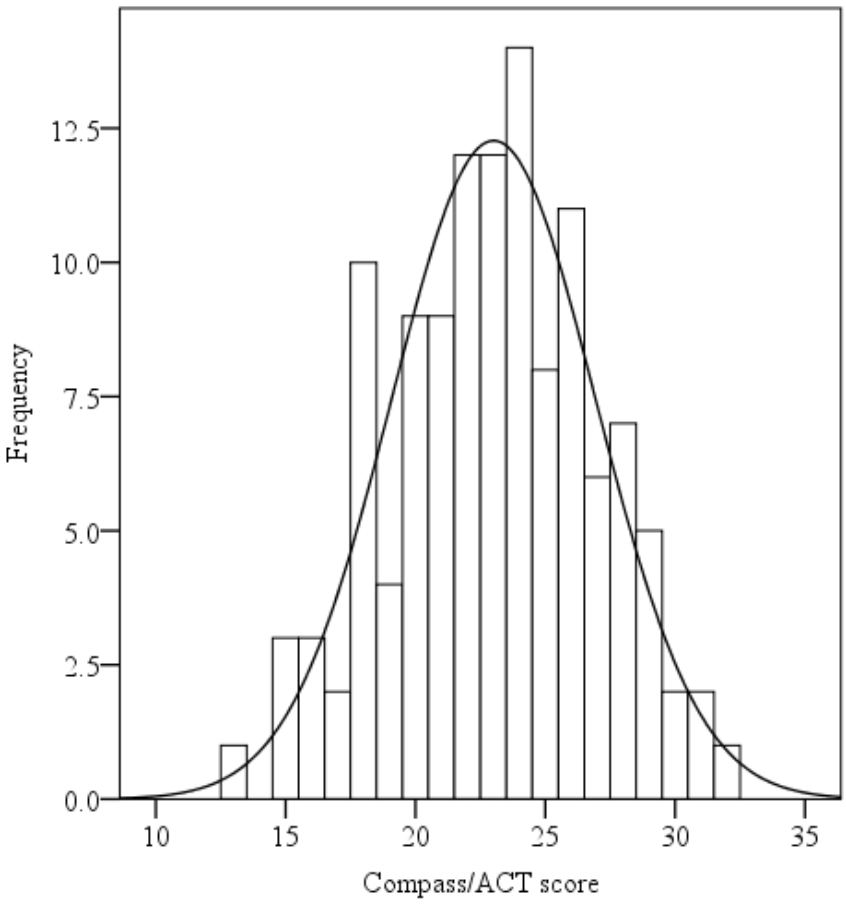

Figure 1. Histogram of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores (n = 121, M = 23.01, SD = 3.93) to indicate a normal distribution of the data as compared to the normal curve.

Appendix B

Figure 2: Boxplot of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores

Figure 2. Boxplot of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores

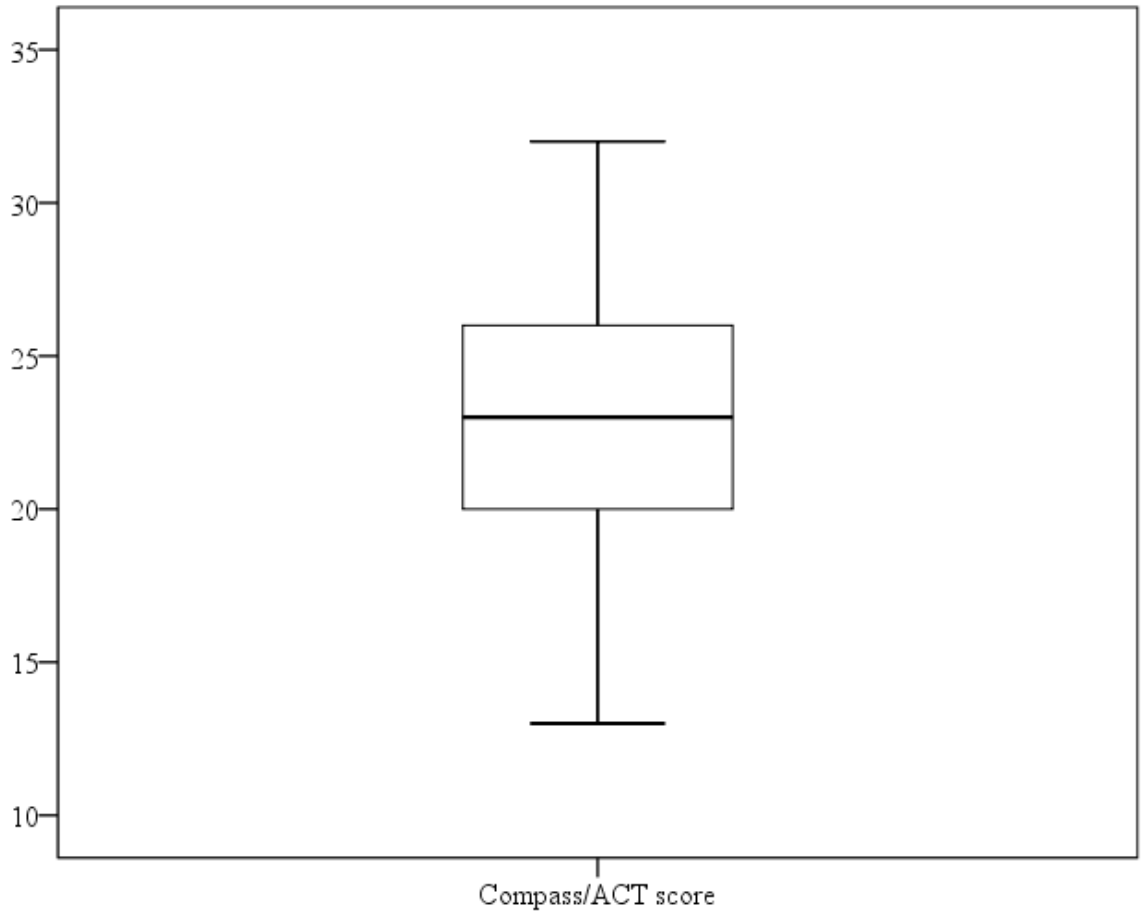

Figure 2. Boxplot of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores (n = 121, M = 23.01, SD = 3.93) to indicate a normal distribution of the data as compared to the normal curve.

Appendix C

Figure 3: Normal Q – Q Plot of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores

Figure 3. Normal Q – Q plot of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores

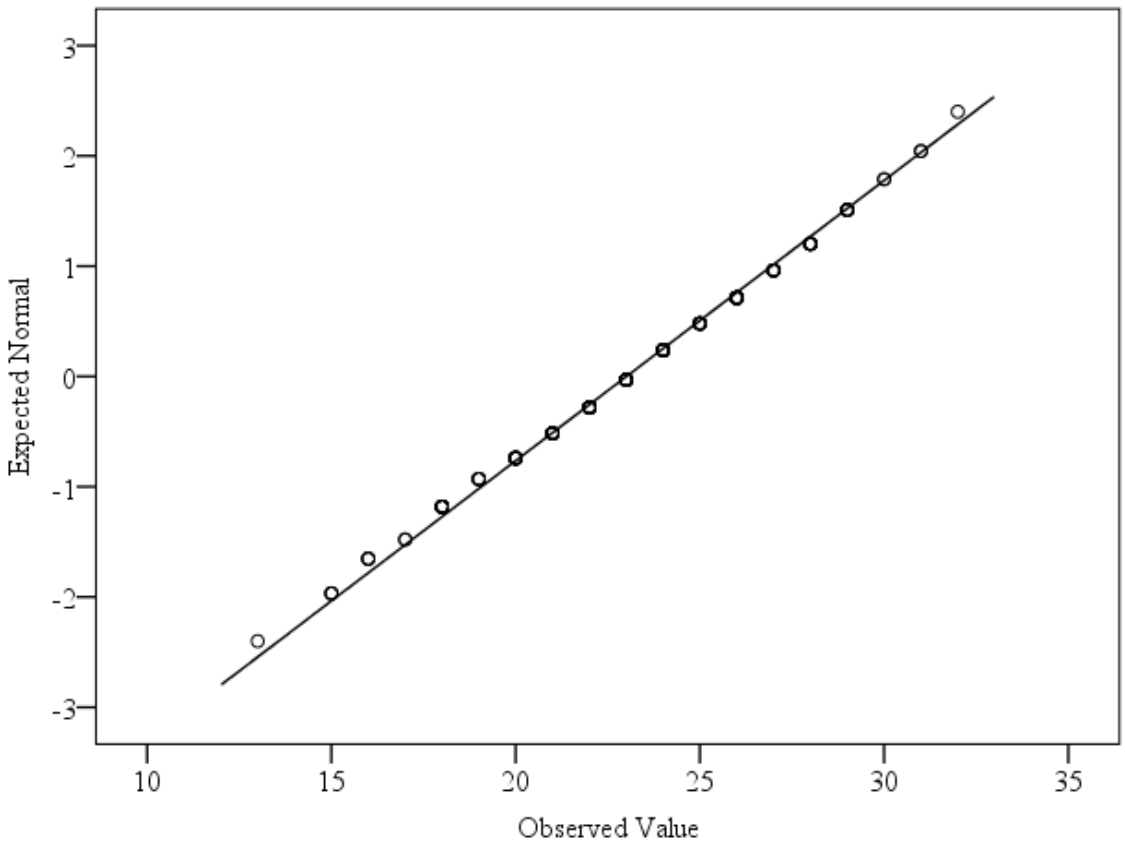

Figure 3. Normal Q – Q plot of Anatomy and Physiology 2 Student Sample COMPASS/ACT Scores (n = 121, M = 23.01, SD = 3.93) to indicate a normal distribution of the data as compared to the normal curve.

Appendix D

Figure 4. Histogram of Anatomy and Physiology 1 Posttest Scores

Figure 4. Histogram of Anatomy and Physiology 1 Posttest Scores

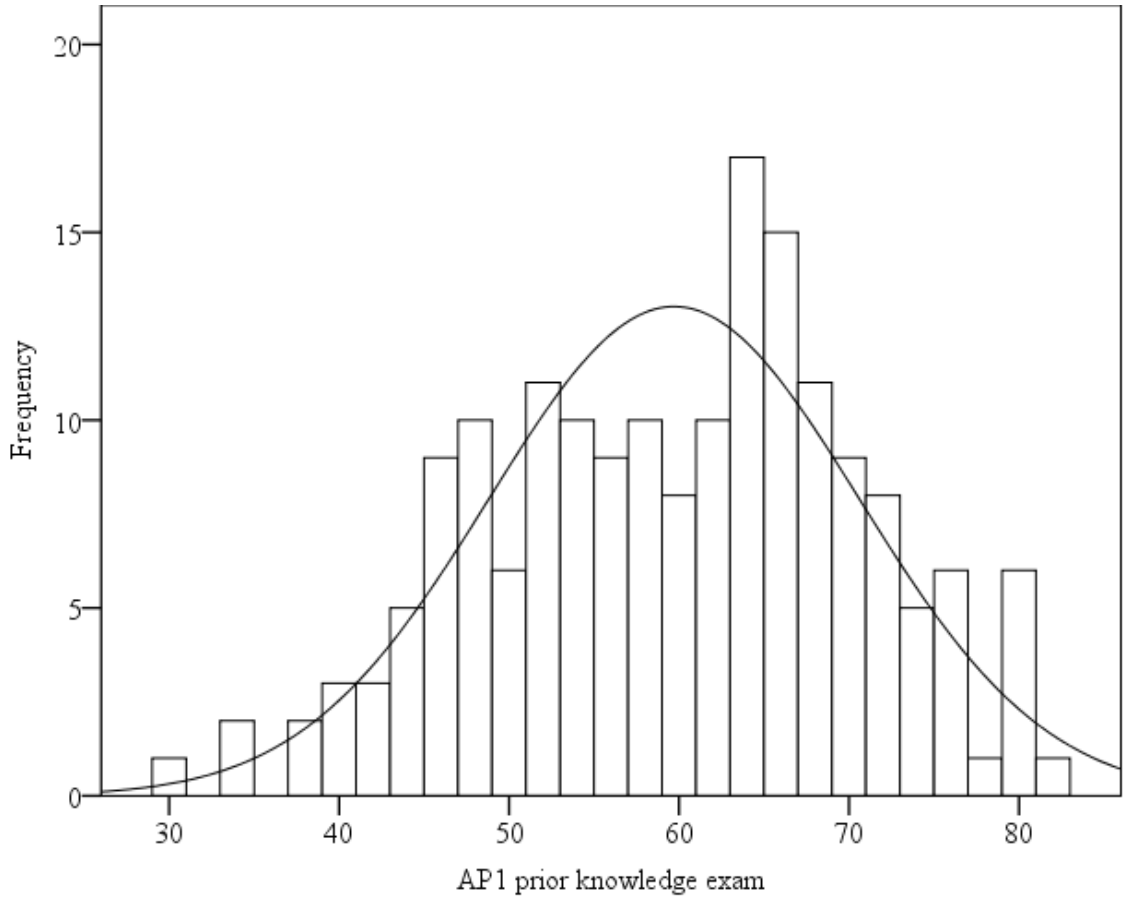

Figure 4. Histogram of Anatomy and Physiology 1 posttest scores (n = 178, M = 59.71, SD = 10.90) to indicate a normal distribution of the data as compared to the normal curve.

Appendix E

Figure 5. Boxplot of Anatomy and Physiology 1 Posttest Scores

Figure 5. Boxplot of Anatomy and Physiology 1 Posttest Scores

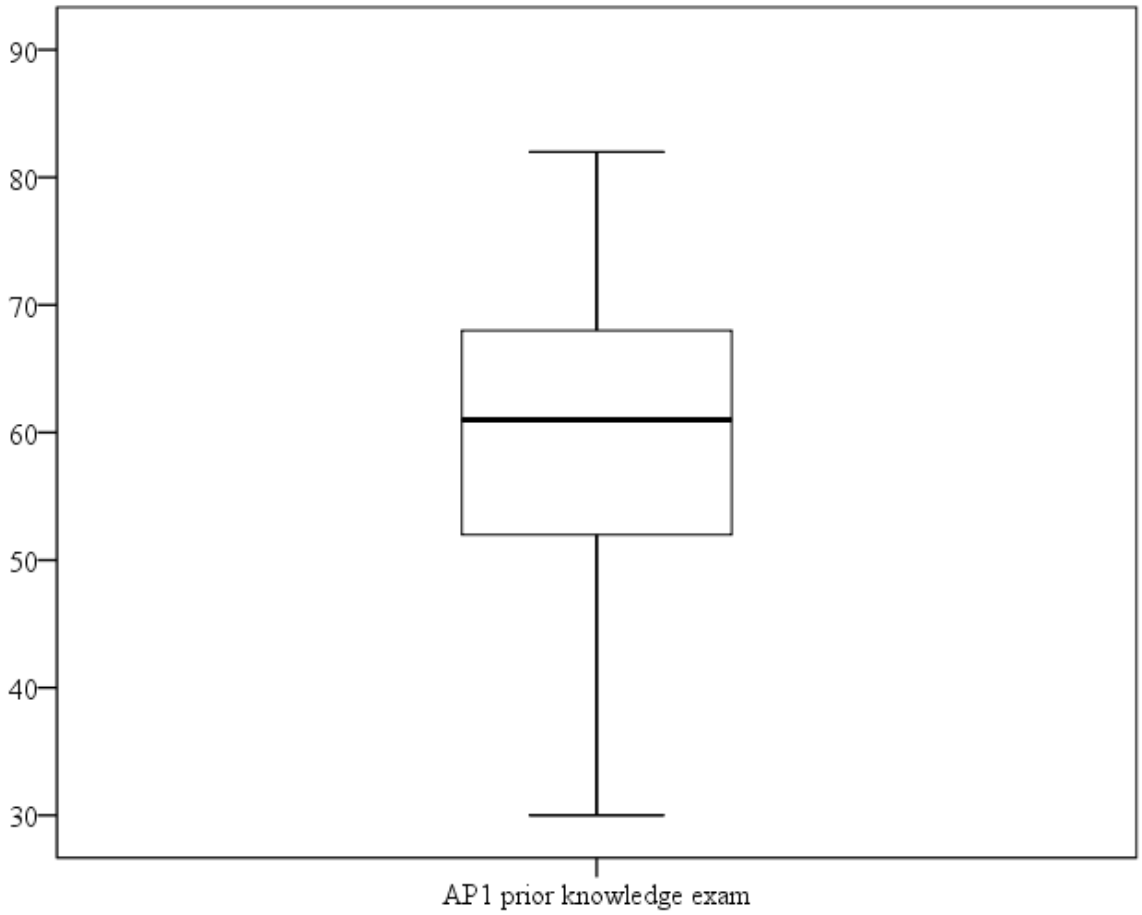

Figure 5. Boxplot of Anatomy and Physiology 1 Posttest scores (n = 178, M = 59.71, SD = 10.90) to indicate a normal distribution of the data as compared to the normal curve.

Appendix F

Figure 6. Normal Q-Q Plot of Anatomy and Physiology 1 Posttest Scores

Figure 6. Normal Q-Q Plot of Anatomy and Physiology 1 Posttest Scores

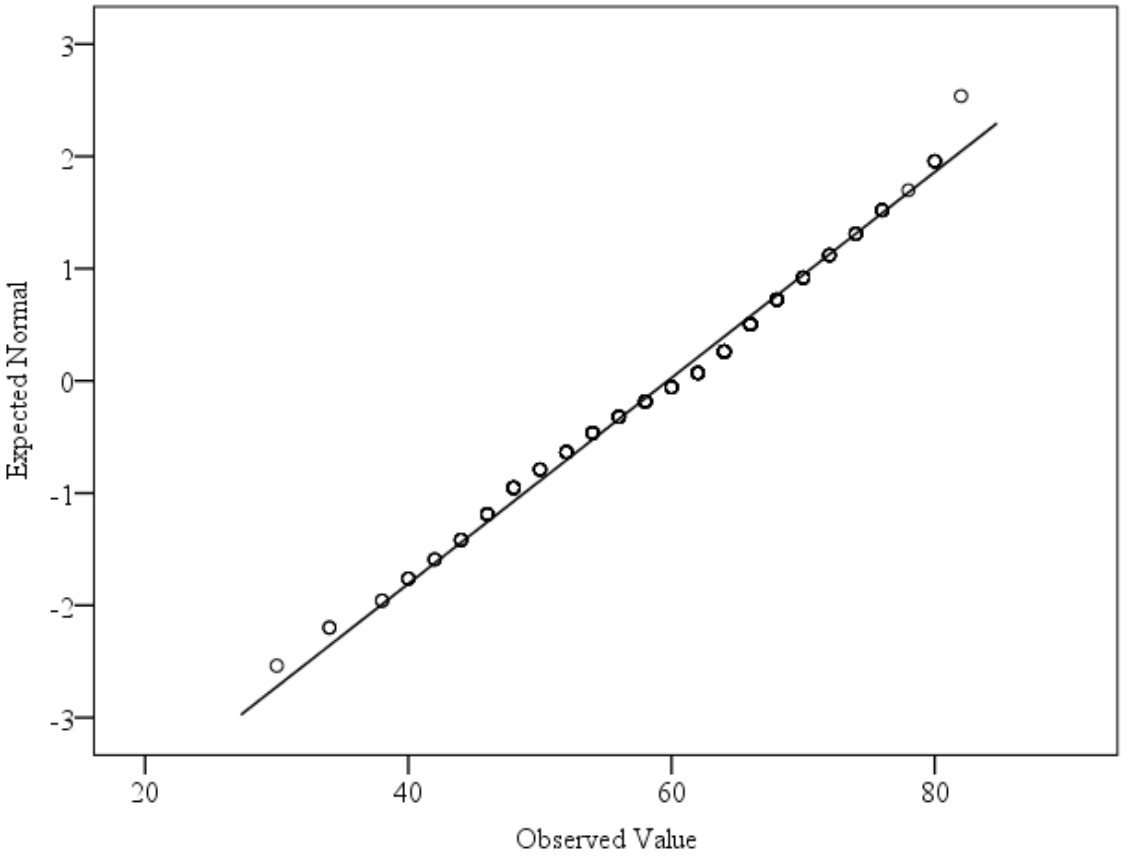

Figure 6. Normal Q – Q plot of Anatomy and Physiology 1 Posttest scores (n = 178, M = 59.71, SD = 10.90) to indicate a normal distribution of the data as compared to the normal curve.

Appendix G

IRB Approval Letters

August 17, 2012

MEMORANDUM

TO:	Kristine Garner Michael Miller
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	12-08-042
Protocol Title:	*A Comparison of Student Success by Faculty Qualifications*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 08/17/2012 Expiration Date: 08/16/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (http://vpred.uark.edu/210.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 300 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

University of Arkansas - Fort Smith

Institutional Review Board
Response to Request for Review

UA Fort Smith IRB	Registration 12-015 Date 08-02-2012	
Principal Investigator	Name Kristie Garner Telephone Office: , Home:	E-mail
Project Title or Description	A COMPARISON OF STUDENT SUCCESS BY FACULTY QUALIFICATIONS	

The items checked need to be completed for further review

- ☐ Add advisor/student contact information
- ☐ Add a statement that the participant is at least 18 years of age. (Under 18 require parental/guardian permission.)
- ☐ Add a statement that participation is voluntary and that participation can be withdrawn at any time without penalty.
- ☐ Provide a signature and date line for participants on the consent form.
- ☐ Add a space on the Parental Permission form for the child's name.
- ☐ Develop a simple assent form for review
- ☐ Add statement regarding video/audio tapes must include where they will be kept, for how long, when or if they will be destroyed, who will have access to them, etc.
- ☐ A statement from the school, institution, facility, etc., granting permission to conduct research is needed
- ☐ A cover letter for mail surveys is needed.
- ☐ A copy of the survey instrument is needed.
- ☐ A copy of the consent form is needed.
- ☐ A copy of the assent form is needed.
- ☐ A statement of how the data will be kept confidential is needed.
- ☐ What is the expected duration of the study?
- ☐ How will you protect the privacy of the subjects?
- ☐ How will you recruit subjects?
- ☐ Address debriefing or attach form
- ☐ References are needed.

Comments: _____

_____

_____

Recommendations:

☑ **Exempt from Review**

Signed Dr. Sydney Fulbright Date 08-02-2012

☐ **Expedited Review**

- ☐ Approved as submitted
- ☐ Approved with conditions which must be met prior to initiation of research.
- ☐ Not approved

Signed _____ Date _____

☐ **Full Board Review**

- ☐ Approved as submitted
- ☐ Approved with conditions noted which must be met prior to initiation of research.
- ☐ Not approved

Signed _____ Date _____

Note: Approval expires one (1) year from the date above. If significant changes are made to this protocol, prior approval from the IRB must be obtained. If you disagree with the final IRB recommendation you may appeal the decision