The Predictive Relationship Between
Budget Expenditures for Instruction and Academic Support,
Affordability, and Student Completion Rates:
A Quantitative Study of Three Missouri Community Colleges

Shelley Kneuvean
B.A., William Jewell, 1991
M.S., University of Missouri – Kansas City, 1992

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

Judy Korb, Ph.D.
Judy Korb, Ph.D.
Major Advisor

Tes Mehring, Ph.D.
Tes Mehring, Ph.D.
Committee Member

Sally Winship, Ed.D.
Sally Winship, Ed.D.
Committee Member

Date Defended: April 22, 2021

Abstract

This study examined the predictive relationship between the percentage of budget expenditures for instruction and academic support, affordability of tuition, and student completion rates at three selected Missouri community colleges. The objective of this study was to consider how these variables could be included or excluded from the Missouri state performance funding formula that determines state funding allocations to colleges in an effort to increase student completion rates. By better understanding research on factors that positively predict improved student completion rates, public officials in the state of Missouri and leaders of higher education at the three institutions analyzed in this study can make better data-informed budgetary decisions. Using multiple regression analyses, the predictive relationships between three independent variables of budget expenditures for instruction, budget expenditures for academic support, and affordability with the dependent variable of student completion rates were investigated. Results showed that at the three selected Missouri community colleges analyzed, affordability had a significant predictive positive relationship with student completion rates, and larger declines in the percent of budget spent on instruction had a significant predictive negative relationship with student completion rates. Results at the three selected Missouri community colleges did not indicate a significant predictive relationship between the percent of the budget spent on academic support with student completion rates. Results of the study indicated that the affordability measure, which as of 2021 was a measure included in the State's performance funding formula, should continue to be part of the Missouri performance-based funding strategy for higher education. Results also indicated that there may be a reason to consider limiting substantial budget reductions in the category of instruction as part of the State's performance funding formula.

Dedication

During my program towards the end of course work, our family was faced with a significant crisis involving one of my children. Completion of my dissertation was delayed while I focused on family, but the experience also pushed me to stick with it, not give up, and be a role model for my children, Alex and Anna. I have tried to model for them that with hard work and determination, anything can be accomplished. I hope they see that in me with the completion of this significant accomplishment and it inspires them to adhere to the same values.

Both of them think my work is boring and in fact, they think the topic of this dissertation is even more boring, but I want them to know I have found purpose with my work and I believe I am making a difference in the lives of others. With their respective life dreams, that is what I wish for them as well - to take their unique talents and gifts and find purposeful work that they believe makes a difference in the world. I encourage them both to keep learning and keep growing as I have across the last thirty years, and to take risks to learn new things and be challenged. With that, I dedicate this dissertation to my son Judson Alexander Kneuvean and my daughter Anna Olivia Kneuvean.

Acknowledgments

First, I want to thank Dr. Jacqueline Snyder, past chancellor of Metropolitan Community College of Kansas City for her encouragement for me to apply to the Ed.D. program at Baker University. It was her encouragement that led me down the path to pursue my doctorate in higher education leadership. Second, I would like to thank each instructor throughout the program which ranged from Dr. Tes Mehring challenging our beliefs about the future of higher education and the leadership traits needed to Dr. Judy Korb who helped us explore the complexities of leading a university's financial and human resources. And third, I would like to thank Dr. Sally Winship for her coordination of my directed field experiences which exposed me to areas of higher education that were less familiar to me in development and academics. It is with sincere gratitude that I extend my appreciation to Dr. Korb who has continued as my major advisor and has guided me through the dissertation process, as well as Dr. Mehring and Dr. Winship for serving on my dissertation defense committee. I would be remiss if I did not acknowledge the tremendous work of Dr. Kayla Supon Carter who held my hand while navigating the world of statistical analysis and multiple regression. These talented women have taught me so much and I am extremely grateful to have had the opportunity to learn from each of them. I strongly believe this program and each person involved in supporting this program has made me a better leader today.

I would also like to thank my children, Alex and Anna. As a working single mother, it has always been a challenge to find a balance between work and life. When I decided to add pursuing my doctorate to that same mix, it was because I knew that my children support me as much as I support them and we could do it together as a family.

Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

According to the American Association of State Colleges and Universities

(AASCU, 2018), five of the top 10 issues facing higher education are managing sluggish

state revenue growth to fund education, maintaining college affordability, meeting

economic and workforce development demands, improving performance-based funding

strategies, and increasing college completion. In an attempt to maximize public funding,

while also holding down the cost of tuition to be affordable for students, many states have

begun distributing funding to public higher education institutions using performance-

based funding models. These models are intended to drive specific desired outcomes,

such as student completion, that ultimately support state economic development

strategies that rely upon an educated workforce. This study examined the influence

instructional and academic support expenditures and affordability have on student

completion rates, focusing on three similar Missouri community colleges. The

expenditure categories were selected as they are the most directly connected to the

students and their academic pursuits. The results of this study provided data that may

help improve the State of Missouri's performance funding model to better achieve

desired outcomes.

Background

More than half of all jobs in the United States will require a college degree

between 2020 and 2030. However, fewer than half of the students who enroll in college

complete their degree program (Complete College America, 2017). Businesses and

organizations expect institutions of higher education to produce a highly educated and

skilled workforce necessary to meet their evolving industry demands (Kelchen &

Meadows, 2016). Additionally, "Research repeatedly shows that college matters:

graduates are more likely than non-graduates to be employed, to earn good salaries, to be

happy, and to live long lives" (Leonhardt, 2020, para. 7). Of the students who do obtain

their degree, it is requiring more time to achieve completion, and students are paying

more for their education and graduating with significant debt (Complete College

America, 2017). Since 1983, the cost of a college degree has increased nearly five times

the rate of inflation and student debt has increased substantially, while graduate salaries

have remained on a flat trajectory (The Economist, 2014).

 Due to a strong economy and higher tuition costs, fewer students are enrolling in

college with an overall decline of 11% from 2012 to 2019 (Nadworny, 2019). Figure 1

demonstrates the national enrollment trend which has been steadily declining.
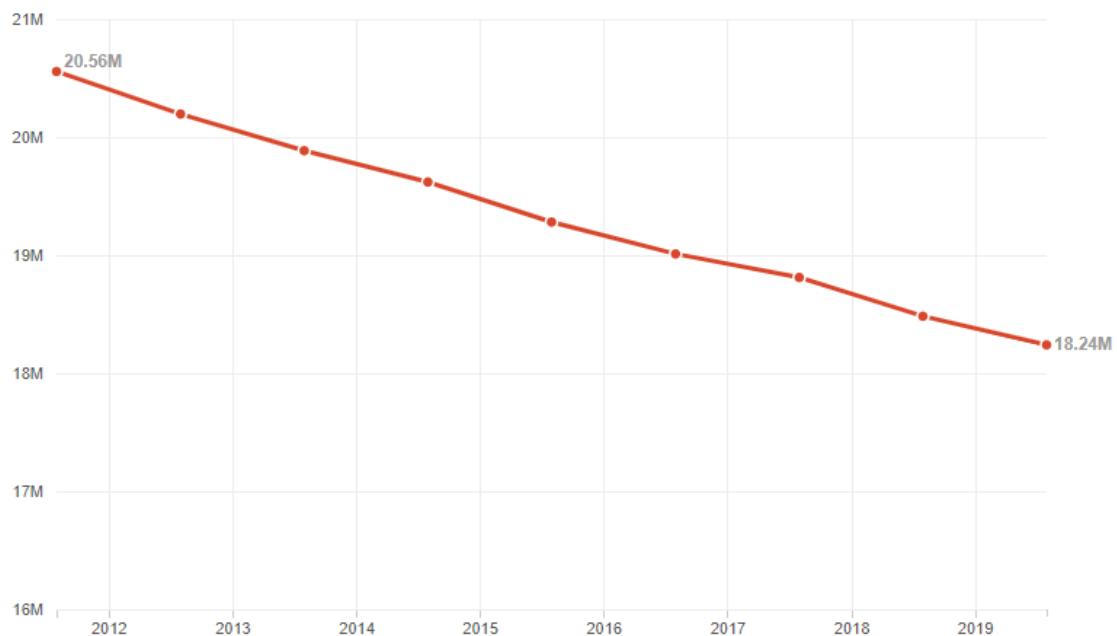
Figure 1. Decline of Student Enrollment across the United States. This figure illustrates
the national enrollment trend demonstrating the significant decline in the last 8 years
(Nadworny, 2019). No copyright.

The decline in student enrollment has been compounded due to increasing education costs which has caused students to question the value of a college degree. While 62% of college students reported that college provided value for the price, only 13% believed there was excellent value in higher education, and 35% of college students believed institutions should be accountable for their career success (Kelchen & Meadows, 2016). Students expect a return on their investments of time and money by completing their degree in a reasonable amount of time and securing a good-paying job after graduation (Kelchen & Meadows, 2016). According to Kelchen and Meadows (2016):

> Colleges are facing intense pressure to demonstrate their value to students, their families, and the public after decades of rising tuition prices. The release of college and university data on earnings and student loan repayment rates has only heightened that pressure, as college costs, graduation outcomes, and student debt levels can be compared on a national basis. (p. 30)

Public colleges and universities have been able to keep tuition lower for students because of state financial support, although the amount varies greatly between states (Uhran & Conroy, 2015). Because state governments fund public institutions in addition to the tuition and fees paid by students, there have been increasing expectations for improved student outcomes from not only students, but also state officials. State officials have sought a return on the public investment to ensure the state has a skilled workforce to support its economic development efforts (Dougherty, et al, 2016). While state officials want to achieve higher student graduation rates, they also want to ensure a college education remains affordable and institutions operate efficiently (Kelderman,

2017). Traditionally, allocating state funding among colleges has been based on enrollment, dividing the state funds equitably utilizing a per-student allocation formula. However, some states have modified the methodology of awarding state aid. As of 2010, more than half of states had implemented some form of performance-based funding to allocate state funds in a manner intended to achieve better student outcomes (Dougherty & Reddy, 2011). The purpose of outcome-based performance funding models is to encourage colleges to implement strategies that improve outcomes and direct state resources to those institutions that are most effective and efficient (Dougherty, et al., 2016).

While the need for more college-educated graduates in the workforce continues to grow, the cost of a college education has increased exponentially and completion rates have declined (Complete College America, 2017). Community colleges are positioned to help advance student completion rates at a lower cost. According to Pratt-Kielley (2020):

Community colleges in America are now very visible and highly respected institutions of higher education. More than 1,000 community colleges in all 50 states now comprise nearly 25% of all colleges and universities in the U.S., with over 6.5 million students, or about 45% of all college students. (para. 1)

As overall college enrollment has been trending downward, community college enrollment has continued to increase, primarily in the number of part-time students (Ma & Baum, 2016). While several factors have motivated more students to enroll in community colleges, one driver has been the considerably lower cost of two-year community colleges compared to four-year universities (The Princeton Review, 2017).

Although more students have enrolled in community colleges, these institutions have also struggled with students not completing their degree programs within the normal completion time. Fewer than 15% of first-time, full-time students complete within two years, and approximately 24% complete within three years, or 150% of the normal time (Kraemer, 2019). Fewer college graduates creates challenges for the nation's economic vitality due to an emerging workforce that does not have the education and training required to adequately meet the needs of businesses and employers. The changing expectations placed on higher education institutions by employers, students, and elected officials add pressure on college leaders to increase the number of graduates with the necessary knowledge and skills needed in the workforce, while also holding down the tuition cost for the students. All college leaders must work to ensure students are successful in completing degree programs to meet businesses' demands for a trained workforce in an affordable and timely manner. Community colleges are uniquely positioned to meet this need given their lower cost of tuition and increasing enrollment trends.

Statement of the Problem

In an effort to hold public colleges and universities accountable for ensuring students complete their degrees on time, states like Missouri have begun incentivizing increased student completion rates with additional funding. States also have begun to redistribute a portion of the existing funding between colleges based on performance measures in hopes of achieving better student outcomes statewide (MHDE, 2018). At the same time, there is an effort to ensure tuition is affordable for students which limits the total resources available for institutions (MHDE, 2018). In response to financial

constraints and growing expectations, higher education leaders must make strategic and data-informed decisions about how to invest limited resources to have the greatest impact on student outcomes. However, there is a lack of research guiding leaders in higher education on the types of expenditures that make the biggest impact on completion rates and the influence of affordability on outcomes. As a result of the changing performance funding models, leaders in higher education must spend limited resources in the most effective way possible to achieve improved student outcomes.

Purpose of the Study

The purpose of this quantitative study was to examine the predictive relationship between types of budget expenditures in two functional expenditure categories and affordability of tuition on student completion rates at three similar Missouri community colleges. The current study analyzed the percentage of funds budgeted for the functional classifications of instruction and academic support as compared to the total budget, with the affordability of the institution as measured by the annual tuition cost related to the median household income for the respective metropolitan statistical area as predictors for on-time student completion rates. Data were examined over a 10-year period, between fiscal years 2008-2009 to 2017-2018 in the following manner:

- Affordability and the percent of expenditures budgeted for the functional classification of instruction relative to the total budget predicting student completion rates at three similar Missouri community colleges over a 10-year period; and

- Affordability and the percent of the expenditures budgeted for the functional classification of academic support relative to the total budget predicting student

completion rates at three similar Missouri community colleges over a 10-year

period.

These categories of expenditures were entered independently and combined with the

affordability measure to test, with statistical regression procedures, whether the

independent variables or their combination were significant predictors for on-time student

completion rates. The purpose of the study was to investigate whether there was a

significant predictive relationship between specific types of expenditures and

affordability on student completion rates. Figure 2 outlines the relationships of the

independent variables and the dependent variable being explored in this study.
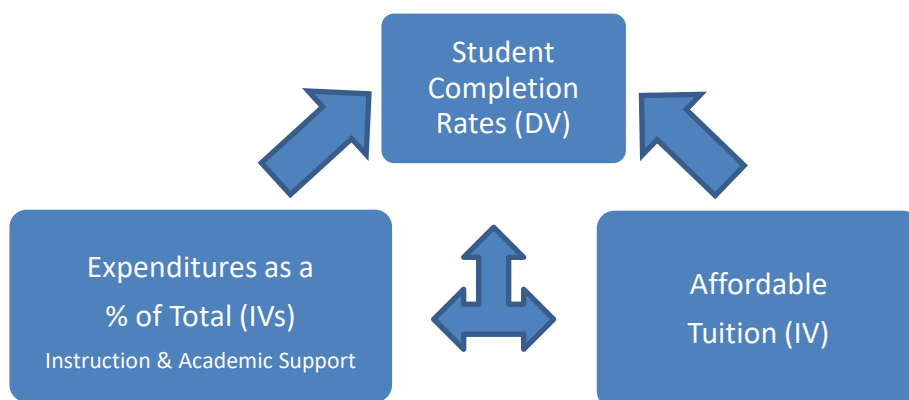
Figure 2. Illustration of Research Variables. This figure is a graphic illustration of the three independent variables compared to the dependent variable separately, and the multiple regression that will analyze the combined independent variables with the dependent variable.

Significance of the Study

Resources for institutions of higher education continue to be strained by

increasing operational costs, limited public funding, and student demands for affordable

tuition. Likewise, students are seeking an affordable education that will lead to a good-

paying job upon degree completion. Public officials want to ensure public dollars are

being spent in ways to achieve desired results, and employers are demanding a higher educated and better-skilled workforce. While research has been conducted regarding the impact of allocating funding by functional classification of instruction, these studies did not consider the variable of affordability and the impact it has on student outcomes (El Fattal, 2014; Glass & Smith, 1979; Isbell, 2014; Pan, Rudo, Schnieder, & Smith-Hansen, 2003; Terry, 2011; Wenglinsky, 1997). Based on a review of the literature as explored in Chapter 2, no research was located that focused on Missouri's community colleges and expenditure classifications with state performance measures such as affordability and student completion. The results of this study could be useful to identify whether certain types of expenditures by functional classification improve student outcomes while holding tuition rates down at community colleges in Missouri. Results of this analysis could also assist state officials and community college leaders in making data-informed funding and budget decisions about the types of expenditures that are most likely to have a positive impact on student completion, while also understanding the relationship affordability has with student completion rates. Additionally, the results of the current study may be useful to Missouri policymakers as they redefine the performance-based strategy for allocating state aid by functional classification of expenditures in an effort to increase student outcomes.

Delimitations

Delimitations are the boundaries associated with the research setting, the selection of participants, or the definition and measurement of variables selected by the researcher (DiscoverPhDs, 2020). For this study, eight factors were identified as delimitations to

narrow the focus of the research being conducted. The following delimitations were

made for the current study:

1. Data over a 10-year period were included in the analysis for three of the 14

    Missouri community colleges (fiscal years 2008-09 through 2017-2018). These

    three colleges were selected due to similar characteristics in geography and

    enrollment and included Metropolitan Community College of Greater Kansas

    City, St. Louis Community College, and Ozark Technical College. As

    demonstrated by Figure 3, the snapshot of the total headcount enrolled at these

    three community colleges has consistently been higher than the other community

    colleges in Missouri from 2014 to 2018.

	2014	2015	2016	2017	2018
Crowder College	5,710	5,584	5,434	4,959	4,521
East Central College	3,606	3,222	2,966	2,897	2,629
Jefferson College	4,883	4,705	4,692	4,439	4,431
→ Metropolitan Community College	18,202	17,680	18,138	16,788	16,351
Mineral Area College	4,632	4,387	4,173	3,700	2,885
Missouri State University - West Plains	2,161	1,970	1,941	1,918	1,869
Moberly Area Community College	5,444	4,823	5,004	4,865	5,174
North Central Missouri College	1,720	1,679	1,722	1,841	1,855
→ Ozarks Technical Community College	14,393	13,611	13,255	12,688	12,217
St. Charles Community College	7,153	6,865	6,755	6,563	6,269
→ St. Louis Community College	21,218	18,902	19,052	18,835	18,157
State Fair Community College	4,981	4,926	5,138	4,786	4,728
State Technical College	1,259	1,274	1,227	1,256	1,471
Three Rivers College	4,201	3,856	3,505	3,226	3,076
Public community and technical college total	99,563	93,484	93,002	88,761	85,633

Figure 3. Enrollment at Missouri Community Colleges 2014 – 2018. This figure highlights enrollment at the three included in this research as compared to the other community colleges. Missouri Department of Higher Education (2019), *Annual Report 2019*. Retrieved at https://dhewd.mo.gov/about/2019annualreport.php. No copyright.

2. A 10-year period was selected to provide adequate data to establish a trend while not encompassing all data since the colleges were established.

3. In addition to focusing on these three colleges in more urban areas and excluding smaller rural community colleges, four-year public universities and private institutions were excluded from this study due to the differences between these institutions in terms of the size of the institutions, total enrollment, and the diversity of degree programs including 4-year degrees and graduate-level degrees.

4. Student outcomes were limited to on-time completers defined as a degree completion within three years of starting, which is the expected completion-time for an associate degree (150% of planned completion-time of two years) for first-time, full-time students. This standard was established by the Integrated Post Education Data System (IPEDS) which compiles data from colleges and universities to measure reporting of successful student completion in a consistent manner.

5. The current analysis was limited to expenditures in the functional classifications of instruction and academic support as they relate to expenditures that directly serve all students including the cost of instruction, teaching, tutoring, and learning resources. Other functional classifications that relate to the general operation of the university such as student services, maintenance of the physical plant, auxiliary services, and athletic programs were excluded from the research.

6. Total budgeted expenditures were limited to the general operating funds and excluded grant funding restricted for specific purposes. Because public institutions are required to follow accounting standards set by the Government

Accounting Standards Board (GASB) and use fund accounting, grant funds are tracked separately from the general operating account and are easily omitted from the analysis to improve the relative comparison of the data. It is understood that grants may impact student outcomes, but grants are awarded for only a limited period of time and generally are not consistent, reliable funding sources.

7. Institutional and academic support are functional classifications of institutional expenditures defined by GASB accounting principles in the operating budget and further defined by guidelines established by the National Association of College and University Business Officers (2020).

8. Specific initiatives, such as intrusive advising, tutoring, peer mentoring, developmental education efforts, etc., may influence student outcomes that were not considered for this study. However, these types of programs would be budgeted as part of the instructional or academic support functional classifications. This study evaluated the total budget for instructional and academic support rather than specific expenditures for initiatives within those categories.

Assumptions

Assumptions are factors considered true or plausibly true when researching the population, sample, sampling, or measurement of variables, but cannot be independently verified. According to Lunenburg and Irby (2008), assumptions are also made about the "nature, analysis, and interpretation of the data" (p. 135). With all research, there are certain assumptions deemed accurate given available data and the inability to control for some variables. The following assumptions were made for the current study:

1. Institutions properly accounted for expenditures by functional classification as designed by the GASB and the NACUBO. Although each institution's figures were not individually substantiated, each public institution is subject to an annual outside audit that verifies the proper classification of expenditures as reported, which means the expense classifications were verified by an independent third party.

2. Many factors may influence a student's performance. However, for purposes of this study, it was assumed that the students had given their full effort to complete their degrees on-time.

Research Questions

RQ1. To what extent is there a predictive relationship during fiscal years 2008-2009 to 2017-2018 between the percentage of the total budget spent on the functional classification of instruction and the affordability measure as defined by MDHE during that 10-year period with the percentage for on-time student completers of associate degrees for three similar Missouri community colleges?

RQ2. To what extent is there a predictive relationship during fiscal years 2008-2009 to 2017-2018 between the percentage of the total budget spent on the functional classification of academic support and the affordability measure as defined by MDHE during that 10-year period with the percentage for on-time student completers of associate degrees for three similar Missouri community colleges?

Definition of Terms

Academic support expenditures. According to the NCES (2020b), academic support expenditures include support services for the institution's primary

missions: instruction, research, and public service. Examples include academic administration such as the dean's office, libraries, educational media services, academic computing services, ancillary academic support, academic personnel, and curriculum development.

Affordability. MDHE defines affordability for Missouri community colleges as the in-district tuition and fees as a percent of in-district median household income for the respective metropolitan statistical area (MDHE, 2017).

Associate degrees. Associate degrees are typically two-year programs of study at a community college and sometimes offered at a four-year university as well (Top Universities, 2020).

Community colleges. The Missouri Community College Association (2020) defines community colleges are two-year colleges that serve designated service areas and are open-access institutions of higher education granting two-year degrees and certificates. In Missouri, community colleges are established under Missouri State Statute RsMO 178.70 and serve designated service areas defined by the State Department of Higher Education.

Completion rates. According to NCES (2016), completion rates are the number of full-time, first-time degree/certificate-seeking students who started and finished at the same institution and successfully graduate with a degree. The rate is calculated with the number of full-time, first-time degree-seeking students that complete within 150% of the expected time divided by the total number of full-time, first-time students and is how data is reported to IPEDs. For an associate two-year degree, this constitutes a three-year timeframe for completion. This is the definition currently in place as of this study.

Functional area expenditures. Functional area expenditures are accounting classifications of expenses by functional type including instructional, academic support, student services, plant operation and maintenance, institutional support (general administration), scholarships, and public service. These accounting standards are established by GASB to improve consistency in financial reporting. Further guidance is provided by NACUBO (NCES, 2020b).

Government Accounting Standards Board (GASB). The governing board that establishes the accounting and financial reporting standards for state and local governments and other public entities is the GASB (GASB, 2020).

Integrated Post Education Data System (IPEDS). The National Center for Education Statistics (NCES) has established the Integrated Post Education Data System (IPEDS) which is a system of interrelated surveys conducted annually by the National Center for Education Statistics (NCES, 2020a). Information is compiled in a database called IPEDS about colleges, universities, and technical institutions that participate in federal student financial aid programs; and includes reporting on enrollment, graduation rates, finances, and cost of tuition and fees (NCES, 2020a).

Instructional expenditures. According to the Government Accounting Standards Board (GASB, 2020), instructional expenditures include all activities that are part of an institution's instructional program. This includes instruction personnel teaching college credit and noncredit courses for academic, vocational, and technical instruction; remedial and tutorial instruction; and special sessions as defined by NACUBO. It includes departmental research and sponsored instruction but excludes academic administration

when the primary assignment is administrative such as the academic dean and/or provost is classified as academic support (NCES, 2020b).

National Association of College and University Business Officers (NACUBO). Representing more than 1,900 colleges and universities across the country, NACUBO is the professional membership organization formed in 1962 that serves chief business and financial officers by sharing best practices, advocacy efforts, community service, and professional development activities. The association's mission is to advance the economic vitality, business practices, and support of higher education institutions in pursuit of their missions (NACUBO, 2020).

National Center for Education Statistics (NCES). The NCES is the primary federal entity for collecting data related to education in the United States and worldwide (NCES, 2020a).

Organization of the Study

This dissertation has been organized into five chapters. Chapter 1 provided the background of the research topic, statement of the problem, the purpose of the study, the significance of the study, the delimitations and assumptions, and the research questions being posed by the researcher conducting the current study. Chapter 2 includes a review of the literature exploring the various aspects of the research topic more thoroughly. The research methods used for the current study are explained in Chapter 3. Chapter 4 summarizes the results of the data analysis and hypothesis testing. Finally, Chapter 5 provides interpretations of the results, a discussion of the study's key findings related to the research literature, and recommendations for further research.

Chapter 2

Review of the Literature

"The great majority of the 3,000 or so four-year colleges and universities are primarily devoted to teaching students, mainly in occupational fields that in theory equip graduates to obtain jobs" (Wai, 2019, para. 4). According to the Community College Research Center (2020), "Community colleges serve multiple missions—from workforce training to remediating students in preparation for higher education, to community enrichment" (para. 1). Community colleges, sometimes called junior colleges, are two-year schools that provide affordable post-secondary education through associate degrees and certifications. Also, these institutions provide a pathway to a four-year degree. According to the American Association of Community Colleges, 1,167 community colleges in the United States enroll more than 12.4 million students and serve almost half of all undergraduate students in the United States (Department of Homeland Security, March 2012, para. 2). The literature review includes the following topics: cost of a college education, educated workforce a state priority, decrease in state funding for higher education, types of state funding models for public higher education institutions, budget expenditure types that may influence student completions, and other factors that may influence student completion.

Cost of a College Education

"Since 2005, tuition and fees have increased about 25% faster than inflation at four-year colleges and 40% faster at two-year colleges. At the same time, student debt has risen to an average of $33,000 per graduate" (Kelchen & Meadows, 2016, p. 7). Perhaps even more concerning is that the cost of tuition has increased nearly eight times

faster than wages (Maldonado, 2018). Berman and Zehngebot (2017) analyzed data from

the U.S. Department of Labor and reported that tuition had increased 183% at public

colleges and 142% at private institutions, while early-career salaries had only increased

2.3% over the same 30-year period. As demonstrated in Figure 4, the increased cost of

tuition has well outpaced the increase in wages for college-educated workers when

adjusted for inflation.
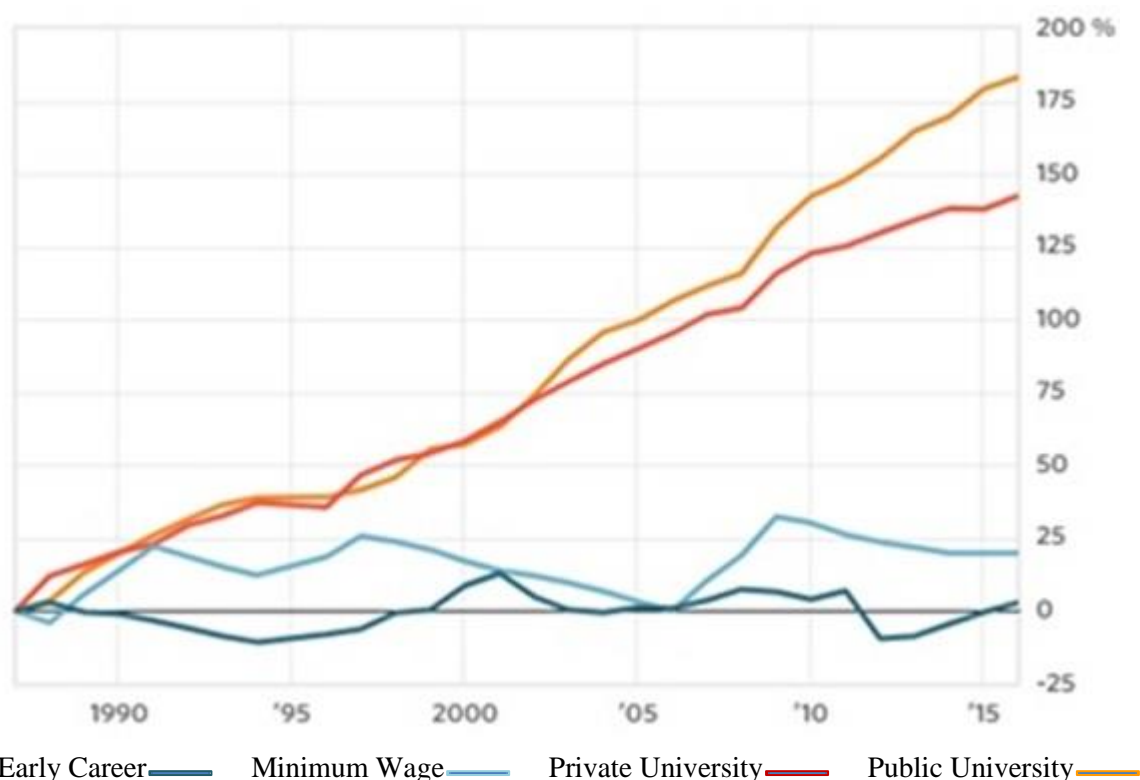
Figure 4. Cost of Tuition Compared to Wages 1987 – 2015. This figure demonstrates
the exponential rise in the cost of tuition compared to early career salaries of college
graduates and minimum wage. (Berman, J. & Zehngebot, J., 2017). No copyright.

The overall cost of a college education has increased exponentially and with

decreased public funds, tuition paid by students has increased significantly as well. This

has resulted in students taking on more significant amounts of student debt and

questioning the value of a college degree (Complete College America, 2017). When

wages are not growing enough to offset the higher debt burden assumed by students, it compounds the growing concern of whether or not a college education is worth the cost and investment (Kelchen & Meadows, 2016). At the same time, employers are demanding a more educated workforce and the need for more skilled and knowledgeable workers (Complete College America, 2017).

Community colleges are more affordable due to their lower tuition. In Missouri, 12 community colleges serve more than 90,000 students annually offering associate degree programs, workforce-related certifications, and specialized workforce training programs (Missouri Community College Association, 2017). During 2019-2020, the average cost of attendance was $3,522 annually for community colleges compared to $6,195 for in-state tuition and $15,788 for out-of-state tuition at public four-year universities in Missouri (College Tuition Compare, 2020). The average annual cost of attendance at a private four-year institution was $18,179 (College Tuition Compare, 2020). Additionally, in Missouri, students may be eligible for grant funding through the A+ program which provides funding for eligible high school graduates to attend community colleges at no cost for up to 12 credit hours per academic semester (MDHE, 2017). Another factor impacting overall cost is that students may have the option of living at home or off-campus as many of these institutions are non-residential colleges and many students work while attending college (The Princeton Review, 2017). Missouri community colleges cost less than their four-year counterparts, making the 2-year degree and certificate programs more affordable for students. In addition, these institutions provide an affordable alternative for the first two years of college for students intending to transfer to four-year institutions. As students are looking for strategies to lower the cost of

obtaining an education, community colleges provide an affordable alternative to larger public

institutions or private universities. As reported by The Princeton Review in 2017:

> Community college tuition is usually thousands of dollars cheaper than
>
> tuition for private and public four–year universities. The average in-state
>
> tuition at community colleges for 2014–2015 according to the College Board
>
> was just $3,347. This total cost is only a fraction of the cost of a private
>
> college, and still thousands of dollars less than a four-year program at a state
>
> college. (para. 3)

Community colleges provide access to two-year degree programs or the first two years of

a four-year program at a substantially lower cost, which helps to preserve the

affordability of obtaining an advanced degree.

Educated Workforce a State Priority

There is a growing need for an educated workforce that has the potential to create

higher-paying jobs. Businesses and organizations are looking to institutions of higher

education to produce an educated and skilled workforce to meet their constantly evolving

industry demands (Kelchen & Meadows, 2016).   Given the importance to the overall

economy, state governments emphasize the need for a trained workforce through post-

secondary education as part of their economic development strategy (Anderson & Keily,

2018). For example, MDHE (2019) determined that:

> By 2020, approximately 66% of all jobs in Missouri will require some form of
>
> postsecondary education – a professional certificate or a two-year, four-year, or
>
> advanced degree. The state has set a goal – Missouri's Big Goal – for 60% of adults
>
> to have a certificate or degree by 2025. (p. 1)

To further demonstrate the role of higher education and the importance of a well-trained workforce to the overall economic development strategies for the state, MDHE was rebranded as the Missouri Department of Higher Education and Workforce Development (MDHEWD) in 2019. As MDHEWD works with the Missouri Department of Economic Development to achieve the goals of the strategic plan, discussions have pivoted to student outcomes while also considering the affordability of higher education.

In January 2016, MDHE and the Coordinating Board of Higher Education adopted a strategic plan, *Preparing Missourians to Succeed: A Blueprint for Higher Education,* to outline higher education goals with a strong focus on outcomes (MDHE, 2016). Three of the plan's five goals focus on the importance of higher education and workforce readiness:

> Attainment: Missouri will increase the proportion of working-age adults with high-quality, affordable postsecondary credentials to 60% by 2025.
>
> Affordability: Missouri will rank among the 10 most affordable states in which to obtain a postsecondary degree or certificate by 2025.
>
> Quality: Missouri will produce graduates with high-quality postsecondary degrees and certificates that are valuable and relevant to individuals, employers, communities, and the state. (MDHE, 2016)

Due to the growing demand for a higher-skilled workforce, there is increased pressure on leaders in higher education to improve student completion rates while also managing the cost of earning a higher education degree (MDHE, 2018). The result of fewer college graduates is an emerging workforce that does not have the education and training required to meet the needs of businesses and employers.

The Decline in State Funding for Higher Education

The irony is that while the expectations of public officials for colleges to improve

student completion rates are growing as noted in Chapter 1, the public funds available to

invest in public institutions are shrinking. State appropriations per student are remaining

flat or declining over the last three decades and are now lower than they were in the

1980s (Hillman, 2016). As state funding decreases, increasing costs must be paid by

individual students and families through higher tuition.
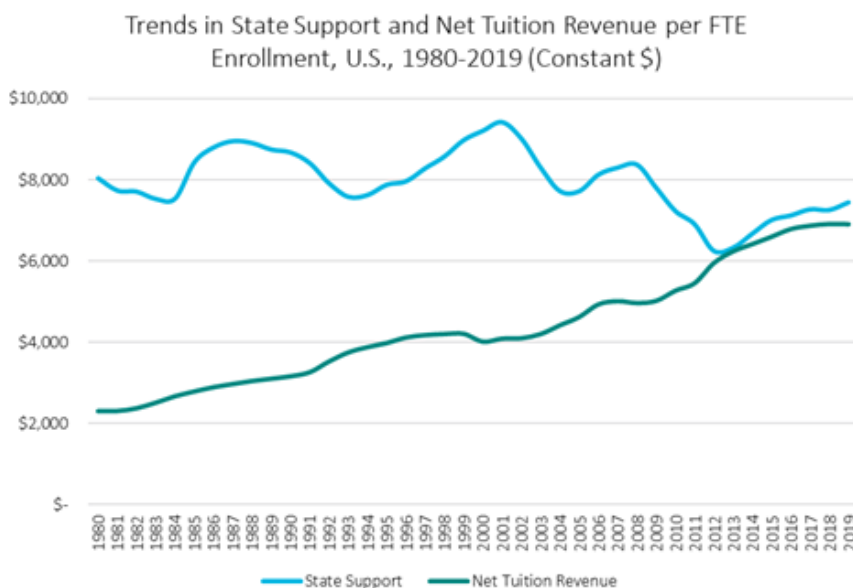
Figure 5. State Appropriations Per Student Compared to Net Tuition, 1980 – 2019. This
figure highlights a rise in the proportionate amount being paid by students compared to
state aid per student. (S. Laderman, State Higher Education Executive Officers
Association, personal communication, January 4, 2021). Reprinted with permission.

As shown in Figure 5, 30 years ago, the state appropriations were significantly more than

the net tuition paid by students. However, as noted by Hillman (2016), "Public colleges

now get more money from students' tuition dollars than from state appropriations. As a

result of these funding trends, there is greater pressure for colleges to show they are

making the most of their scarce public support" (p. 3). Declining state revenues have

affected community colleges in Missouri. As noted by the Missouri Community College Association in 2020, Missouri community colleges have three main funding sources for operations which included state aid, student tuition and fees, and local property taxes. In reviewing the Missouri funding appropriations for higher education between 2010 and 2018, MDHE (2018) reported that state aid decreased rapidly in the community college sector from $153.8 million in 2010 to $139.7 million, or more than a 10% reduction compounding each year. To offset declining state funding, community colleges had to increase tuition and fees or reduce expenses. In Missouri, community colleges can also increase revenue through higher local property tax rates. However, this option must be approved by a vote of the public and is rarely pursued. During discussions with the Missouri community colleges' chief financial officers, it was noted that while there have been modest tuition and fee increases across the board, the primary strategy to balance budgets for many colleges has been to reduce expenses to preserve affordability for the students (personal communication with D. Gehbaur, C. Eubank, T. Galbiez, J. Alford, S. Spencer, A. Rand, G. Sorrell, S. Hoffstetter, M. Moody, P. Zink, G. Steffes, personal communication, Missouri community college CFOs, May 17, 2017). Expense reductions have included, but are not limited to, eliminating positions, granting employees limited or no pay raises, reducing employee benefits, and deferring maintenance and capital facility projects (personal communication with Missouri community college CFOs, May 17, 2017).

Types of State Funding Models for Public Higher Education Institutions

To combat the ever-growing costs of obtaining a college degree, states invest public funds into public education including higher education. Despite the decline in

state funding, the assistance keeps the cost of tuition paid by students lower than otherwise possible. Given the growing demand for a highly educated workforce, public officials are also concerned about the return on investment of the public dollars supporting public institutions and want to hold institutions accountable for achieving the desired results of successful student completion rates and a trained workforce to benefit the state economy (Dougherty, et al., 2016).

To achieve this goal, state leaders have developed a variety of funding models including enrollment-based, base plus, performance funding, and outcome-based funding strategies. Traditionally, state funds were allocated to higher education institutions using enrollment-based (per student) funding approaches (Hearn, 2015). In some states like Missouri, the base amount or the prior year allocation was fully funded year over year, and an increase in state funding, if any, was allocated based on enrollment growth relative to other public institutions by sector, or base plus (MDHE, 2018). This offered predictability for public colleges and universities, as well as proportionate increases based on growing enrollment comparatively between public institutions within the state. This is the type of funding model the State of Missouri had in place for many years (MDHE, 2018). A variation of this model that some other states have used is to allocate funding based only on annual enrollment without consideration for prior year allocations, or a full enrollment-based formula funding model (Hearn, 2015). The basis for state funding allocations was a set dollar amount of public funding per student enrolled throughout the state. In more recent years, funding models began to shift to consider the specific performance of the institution as a factor to determine annual state aid (Hearn, 2015).

Funding Model and Description	Timing of Emergence	Drivers of Allocation	Disposition
Base-Plus Incremental changes relative to a base amount Decision by fiat by governors, legislators No established formula	1800s	Revenue growth Politics Cost indexes Sectoral shifts	Decentralized, discretion of system, sector, institution levels
Enrollment-Based Formula approach Emphasis on professionalized planning, efficiency, and predictability	Post-WWII years	Primary: costs of educating students (instruction, student services, administration) Secondary: public service, research, scholarships	Decentralized, but numerous line item amendments emerged over time
Early Performance Funding Small portion of funding (usually as a bonus) tied to specific indicators of performance	Late 1970s	Primary in most states: enrollment costs Secondary: performance	Increasingly pointed to value formula components
Outcome-Based Substantial portion of or total allocation tied to performance on clearer metrics	2000s	Primary: performance on clearer measurable metrics, with an increased focus on completion Secondary: enrollment and other non-performance metrics	Pointed to valued state priorities

Figure 6. Comparison of State Funding Allocation Models. This figure is a summary of state funding models over time (Hearn, 2015). Reprinted with permission.

At first, performance funding models were used to supplement the base-plus funding or enrollment-plus bonus funding models. For example, the State of Missouri moved to the model of fully funding the base amount (total from the prior year) and only allocating any new funding to institutions with the best outcomes in five specific areas (MDHE, 2018). The base funding was the prior year allocation which rolled forward year-to-year and any increases in funding were distributed based on the individual college's performance on specific metrics relative to one another within its sector (community colleges versus four-year institutions). State leaders continue to evolve their funding approaches as illustrated in Figure 6.

According to MacKellar (2016), at least 31 states use performance-based funding models for a portion of higher education funding. "State legislatures are always striving to improve budgeting and ensure that citizens' tax dollars are spent efficiently and effectively. One of the strategies states have employed to achieve this goal, with varying degrees of success, is performance-based budgeting" (MacKellar, 2016, p. 1). These performance-based models distribute funding based on specific desired outcomes. Since 2015, state officials in Missouri have implemented new approaches to allocate state aid. The funding allocation formulas have shifted from an enrollment-based approach to incorporating performance-based funding as part of the funding allocation strategy (MHDE, 2015). In a comparative analysis of 18 states that utilized a performance-based funding approach for community colleges, Missouri was ranked last with less than one percent of the allocated state funding in 2015 connected to performance measures (Snyder & Fox, 2016). In 2017, the governor established a task force to evaluate the current performance-based model and make recommendations for improvement. As part of this process, the goal was to shift the funding formula to achieve better outcomes (personal communication, Zora Mulligan, 2017).

Researchers have assessed whether different types of funding models are effective (Hillman, 2016; Snyder, 2015). "Enrollment-based allocations are tied to the number of students enrolled at a census date…this type of allocation rewards expanded access to higher education but does not incentivize program/degree completion – one of today's most pressing policy challenges" (Snyder, 2015, p. 4). Rather than allocating state assistance based on the number of students, states have been moving toward performance-based models that allocate funding among the institutions based on their

student outcomes, generally student degree completion. Snyder concluded upon reviewing data from several studies in 2015 that enrollment-based models are not as effective as other models in assisting universities to achieve certain outcomes. Hillman, Tandberg, and Gross (2014) noted that in a study of the Pennsylvania State System that the move to a performance-based funding model demonstrated limited evidence of a positive effect and they concluded it was ineffective at increasing college completions. Based on additional research, Hillman found (2016):

    Supporters of the concept believe that the $75 billion states invest in public higher education each year will not be spent efficiently or effectively if it is based on enrollment or other input measures because colleges have a little financial incentive to the organization around supporting students to graduation. (para. 2)

    Hearn (2015) studied outcomes-based funding strategies historically and concluded that outcome-based strategies implemented by state leaders have shifted to focus on outcomes and state priorities. In evaluating the effectiveness of performance-based funding models, Doughtery and Reddy (2013) suggested that these approaches had the result of raising institutional awareness of the state's goals and had some impact on university priorities. Also, as Dougherty and Reddy noted in 2013, early versions of performance-based funding succeeded in prompting change within institutions because colleges were competing with one another for increased funding. Some of these changes included updated academic policies, programs, and practices, and changes in the admissions and financial aid processes (Hearn, 2015). Hillman, Tandberg, and Fryar (2015) concluded that performance-based funding seems to have an impact on institutional behavior. Additionally, Tigro (2015) found positive impacts from

performance funding models with an increase in faculty productivity and overall quality of educational programs.

However, it has also been found that "…performance funding is no silver bullet for improving community college completions; rather, in some cases, it may interfere with national completion goals" (Tandberg, Hillman, & Barakat, 2014, p. i). Other researchers have also suggested that performance-based models may be causing unintended negative consequences (Hillman, 2016). The basis for performance-funding strategies is that institutions that do not meet the state standards receive less funding which may further compound their inability to improve student completion. Hillman (2016) reported:

> One of the most common themes found in the qualitative evaluations of higher education performance-based funding is that low-resourced colleges struggle to meet performance goals. Consequently, they may lose funding and have less capacity to make educational improvements. This can result in a performance paradox in which states demand performance, yet do not provide colleges with the resources to perform. (p. 7)

Another common performance measure is operational efficiency assessed by comparing administrative costs with other functional areas such as instruction, support services, academic support, facilities, and institutional support (Kelderman, 2017). A study undertaken by the American Council of Trustees and Alumni examined the administrative costs compared to the instructional costs to " suggest ways for governing boards to be aware of their colleges' administrative spending and find ways to limit it" (Kelderman, 2017, para. 2). According to Dougherty, et al. (2016):

For several decades, policymakers have been concerned about increasing

the efficiency and effectiveness of postsecondary institutions. In recent

years, performance funding—which directly connects state funding to an

institution's performance on indicators such as student persistence, credit

accrual, and college completion—has become a particularly attractive way

of pursuing better college outcomes. But even as states have made an

enormous investment in performance funding, troubling questions have

been raised about whether performance funding has the effects intended

and whether it also produces substantial negative side effects in the form

of restrictions in access for underrepresented students and weakening of

academic standards. (para. 1)

With declining public funding and an increasing focus on affordability for

students, the impact on the quality of education must be considered. "An affordable

college education is therefore not sufficient if it cannot provide enough full-time faculty,

quality teaching, excellent academic libraries, or up-to-date laboratories. … The dream is

to have affordability, not comprise quality" (Mellow & Heelan, 2015, p. 28).

The research results are mixed on whether state performance-funding models

have a positive or negative impact on student completion rates. The increasing

expectations of employers, students, and elected officials create additional pressure on

colleges to improve student completion rates. Institutions of higher education are being

asked to educate students with the necessary skills while also holding down the cost of

tuition. At the same time, overall state funding assistance is declining due to limited state

resources. The irony is that as public funding from the state is declining, the outcome

expectations continue to increase. This has intensified the discussions by state officials to ensure the public funds are being maximized to achieve desired results by implementing various forms of performance-based funding models. In total, the results of these studies provide evidence that performance-based funding does have some influence on institutional behavior by increasing awareness of state priorities and focusing on their institutional performance due to the desire to obtain increased public funding. However, the literature does not provide evidence that performance-based funding models as a whole impact the rates of student completion positively (Dougherty & Reddy, 2011). Instead, these models may be causing unintended negative consequences.

Budget Expenditure Types that May Influence Student Completion

Whether specific instructional practices and other variables affect student outcomes at all levels of education has been studied for decades. Studies have focused on expenditure patterns in K-12 schools as compared to test scores in Louisiana, New Mexico, Texas, and Arkansas high and low performing school districts (Pan, et al., 2003). These researchers found that higher-performing districts spent more on instruction as a percentage of the total budget and had more teachers and fewer administrative personnel. More recently, researchers found specific expenditures in instruction at the secondary and community colleges levels had a positive relationship with student retention and completion (El Fattal, 2014; Isbell, 2014; Terry, 2011). As Glass and Smith (1979) demonstrated decades ago, smaller class sizes with lower student-to-teacher ratios, which are specific kinds of instructional expenditures, are positively related to student outcomes at both the secondary and post-secondary levels. Evaluating the issue from a different

perspective, Bound, Lovenheim, and Turner (2010) found that the amount of instructional resources per student has an impact on completion:

> Reductions in resources per student at the institutional level may limit course offerings and student support and can lower the rate at which students are able to complete the requirements for a baccalaureate degree. Such institutional level declines in resources per student can be caused either by reductions in state funding or increases in the number of students a college services at a given budget level. In a higher education market dominated by public and non-profit institutions with different levels of selectivity, a given demand shift or reduction in state funding likely will lead to greater stratification of resources across the sectors of higher education. To the extent that institutional resources influence students' likelihood of college success, these changes could contribute to the national and within-sector trends in completion rates. (p. 3)

Additional research has supported the notion that the higher the enrollment without a corresponding increase in non-tuition revenue, the lower amount of resources per student and lower completion rates (Bound and Turner, 2007). "Our results suggest that reduced resources per student following from rising cohort size and lower state expenditures are likely to have significant negative effects on the supply of college-educated workers entering the labor market" (Bound and Turner, 2007, p. i). Wenglinsky (1997) also confirmed the Glass and Smith (1979) research that smaller class sizes impact completion, and noted that other types of expenditures such as capital outlay, administrative costs, and teacher education levels did not impact student outcomes.

Another area of research assessed is the impact of increasing reliance on part-time versus full-time faculty in higher education, which has a lower cost, to determine if there is an impact on student completion. According to the NCES (2020c), of the 1.5 million faculty in degree-granting postsecondary institutions, 54% were full-time and 46% were part-time. Researchers have conducted studies to evaluate whether increasing numbers of part-time faculty impact student outcomes as compared to full-time faculty at the collegiate level. For example, Mueller, Mandernach, and Sanderson (2013) evaluated the use of adjunct instructors in online learning, and reported a significant difference in completion rate, failure rate, and withdrawal rate of students in individual courses between full time and part-time faculty, with full-time faculty achieving better positive results. More recent studies have found that community college students have better outcomes in their introductory math and English courses with part-time faculty (Ran & Sanders, 2020). Flaherty (2013) indicated that increasing reliance on part-time faculty does not impact student success either way at community colleges, but instead it is the size and location of the institution that has the greatest influence on student completion rates. Overall there are mixed results in terms of whether certain types of instructional expenditures impact student completion.

Other Factors that May Influence Student Completion

As noted in this chapter, various researchers have examined issues such as the impact of the rising cost of post-secondary education, the decline of state funding, state funding models for public institutions, and how institutional funds are spent. However, there is also abundant research regarding other factors that may impact student completion such as student preparedness, retention initiatives, teaching modalities,

instructional methods, and student support activities. Some researchers have focused on the changing needs of first-time college students. For example, students are not testing college-ready in reading, writing, and mathematics and are enrolled in developmental or remedial education when entering college for the first time. Johnson (2019):

> The new ACT score results show that scores across the country are continuing to decline slightly from last year, especially in math and English. The number of graduates meeting the required benchmarks in math and English is the lowest it has been in 15 years. (para. 2)

Researchers have documented that this lack of preparation impacts the likelihood of graduating from college. Harrington, Loyd, Smolinksi, and Shahin, (2016) found:

> Lack of college readiness has a major impact on their success, as students who enroll in remedial classes are far more likely to drop out, and the lower the initial placement, the less likely a student is to obtain a degree. (p. 93)

Researchers have also studied the best predictors of student success and graduation from college. Based on a recent study, Cooney (2017) reviewed a national data set and determined that a student's high school GPA was the most predictive indicator of college success. To further support this, Cooper (2018) determined that the high school GPA was a better predictor of college completion than other standardized testing scores. These researchers indicated that institutions that have incoming students with higher high school GPAs are more likely to be successful, regardless of how the institution is spending its resources.

There have also been studies of various retention efforts such as developmental education efforts, first-year experience programs, and faculty advisor models. "While

many of these findings are preliminary, the consistently positive results found in students' early success and persistence suggest that accelerated developmental education is one of the most effective strategies for improving retention" (Hanover Research, 2014, p. 10). In addition, Hanover Research (2014) investigated the effects of the personal connection of faculty to students as advisors and found that "Involving faculty in student advising increases retention by improving students' identification with their academic experience and the institution" (p. 18). Further highlighting the importance of the role of faculty, the Center for College Engagement (2012) found that having a classroom attendance policy enforced by faculty is a strong predictor of persistence.

This is not a comprehensive literature review of all studies that have been conducted regarding the multitude of factors and initiatives that may impact student completion. Instead, this section was intended to demonstrate an understanding of literature and research that exists which has examined best practices and other factors that may affect student completion rates. It is understood by the researcher of the current study that many initiatives, support services, teaching methodologies and styles, college preparedness of students, etc. have been found to have differing effects on student outcomes.

Summary

The cost of a college education has been outpacing the rate of inflation while wages have not kept up. This has caused students to not pursue a higher education degree or take on more debt, and they are beginning to question the return on their investment in a college degree. At the same time, the need for an educated workforce is increasing and will continue to increase over the next decade and beyond. This has

caused state government leaders to make an educated workforce a top priority. State officials have approached the need for an educated workforce differently as they work with institutions of higher education. Through the allocation formulas used to distribute state aid to institutions of higher education, state policymakers have begun to shift the method of distributing funds from enrollment-based formulas to performance-based funding models. More recently, state policymakers have been focused on allocating financial resources to achieve higher student completion rates while also encouraging universities to keep tuition affordable. While the goal of performance-based funding is to allocate financial support based on which colleges are achieving specific measures relative to one another, researchers have reported mixed results as to whether or not these funding approaches achieve better student outcomes.

As outlined and cited in this chapter, some researchers support the concept that subsets of instructional expenditures such as class size may have a positive correlation with student completion. Other researchers have reported mixed results in terms of the growing reliance on part-time faculty and the impact on student completion. Additionally, some researchers have indicated that the changing college readiness of first-time college students in college math and English and high school GPAs have the greatest impact on student completion.

While there is some research regarding how colleges and universities spend resources by functional categories and the impact on student outcomes, the research is limited on which allocations may result in more successful student outcomes while also keeping the cost of the degree affordable for students. Some researchers have suggested that performance-based funding models while decreasing state funding may be creating

competing issues resulting in lower student completion rates. There is a gap in research

that examines budget expenditures by type, affordability, and student outcomes, and how

these variables relate to one another. At the time of this study, there were no known

studies of community colleges in Missouri or community colleges throughout the country

that have evaluated the predictive relationship of budget expenditure categories,

affordability, and student completion.

     Other variables have been studied concerning their potential impact on student

completion. This study does not consider all of the variables that may be impacting

student outcomes, some of which are highlighted above. Instead, the researcher of the

current study examined whether the budget expenditure in the percent of the budget spent

on instruction and the percent of the budget spent on academic support while also

keeping tuition affordable for students had a predictive relationship with student

completion. The context for this study was to examine 10-years of data for three

similarly sized community colleges in Missouri that receive state funding under the

state's performance-based funding model. The current study may provide insights to

assist college leaders in refocusing funding allocation models that are more targeted

toward specific types of expenditures or support maintaining affordability measures.

More specifically, the current study could provide useful information as state funding

models continue to evolve by examining the correlation of expenditures in instruction and

academic services while maintaining affordability and student completion rates. The

methodology used in the current study is explained in Chapter 3.

Chapter 3

Methods

Research Design

The purpose of the current quantitative study was to examine the predictive relationship of instruction budget expenditures and affordability, as well as academic support budget expenditures and affordability, on student completion rates within 150% of the expected time of two-years for a full time student to complete an associate degree at three similar Missouri community colleges. A quantitative correlational research design was employed to investigate to what extent there was a predictive relationship for either model. The first regression model included the percentage of the total budget spent on instruction and the affordability measure as defined by MHDE during a 10-year time period predicting the percentage of on-time student completers. The second regression model included the percentage of total budget spent on academic support and the affordability measure defined by MHDE during that 10-year period predicting the percentage of on-time student completers. Specifically, multiple regression statistical procedures were used to examine the predictive ability of the two different models, each model consisting of two independent variables, as well as their combination, and one dependent variable for three similar Missouri community colleges during the fiscal years 2008-2009 to 2017-2018.

1. Independent variables for the first regression model tested for each of the three community colleges were the percentage of total budget spent on the functional classification of instruction and the affordability measure as defined by MHDE during that 10-year time period for each community college.

2. Independent variables for the second regression model were the percentage of total budget spent on academic support and the functional classification of affordability measure as defined by MHDE during that 10-year time period for each community college.

There was one dependent variable for both multiple regression models, the percentage of student completers for an associate degree within 150% of expected completion time. Each multiple regression model was tested for three Missouri community colleges.

Selection of Participants

For purposes of this study, three Missouri community colleges were included in the data analyzed. These colleges are all two-year public colleges that serve defined geographical service areas, located in larger metropolitan areas, and receive annual funding through the Missouri state legislature. For community colleges in Missouri, state funding is based on core funding which is equal to the prior year funding amount and performance funding which is the new allocation above the prior year core funding. New state funding is divided between all community colleges based on predefined performance measures and the relative performance between the colleges. These three community colleges were specifically selected for this analysis because they are the three largest community colleges in Missouri, each having an annual enrollment of over 12,000 students which was substantially more than the other community colleges in the state (see Chapter 1, Figure 3). All three of the community colleges analyzed receive state funding, have a similar ratio between full-time and part-time students (40% - 45%), and are located in urban rather than rural communities. The total operating budgets of the three community colleges range from $70 million to $181 million. The inclusion of data for

these three community colleges were a purposeful selection of participants to evaluate the

relationship between two different types of budget expenditure categories, affordability,

and student completion rates for similarly situated community colleges in the State of

Missouri.

Measurement

Data were obtained from IPEDs which are publicly available through the

National Center for Educational Statistics (NCES). There are specific guidelines

regarding the data reported to NCES to ensure consistency in reporting between and

among colleges. The data were supplemented with the publicly available information

from annual budgets and audits for fiscal years 2008-2009 through 2017-2018. The

budget expenditure classifications follow GASB requirements and are independently

audited each year, making the financial reports for the three colleges analyzed consistent

in their reporting.

Data Collection Procedures

An application to conduct the current study was submitted to the Baker University

Institutional Review Board on October 19, 2020. Approval to conduct the study was

received on November 18, 2020 (see Appendix A). The two primary sources of data

obtained were the IPED data and the institutional annual budgets and financial audits for

Metropolitan Community College (MCC), St. Louis Community College (SLCC), and

Ozark Technical College (OTC) for fiscal years 2008-2009 through 2017-2018. Budget

information and annual audit data from each institution were used to determine the

percentages budgeted for instructional and academic support budget expenditure

categories as compared to the total general operating budget. All data was publicly

accessible, was not confidential, and did not include any human subjects. IPED's data

are accessible to the public for use without permission through the public NCES website

at https://nces.ed.gov/ipeds/Home/UseTheData.com. These three community colleges

are public taxing districts and must follow the Missouri Open Records Law (RSMo

610.011), commonly known as the Missouri Sunshine Law. The annual budgets were

officially adopted by each college's elected board and are public documents under the

Missouri Sunshine Law, as are the annual financial audits. The budget and audit

documents were requested from and provided by the college's chief finance officers at

MCC, SLCC, and OTC as needed to supplement IPEDs data. Therefore, no specific

permission from any of the three colleges was required to access or analyze the data for

this study.

Data Analysis and Hypothesis Testing

      RQ1. To what extent is there a predictive relationship during fiscal years 2008-

2009 to 2017-2018 between the percentage of the total budget spent on the functional

classification of instruction and the affordability measure as defined by MHDE during

that 10-year period with the percentage for on-time student completers of associate

degrees for three similar Missouri community colleges?

      H1. The percentage of the total budget spent on the functional classification of

instruction is a significant predictor of the percentage of on-time student completers for

associate degrees at Metropolitan Community College (MCC) during fiscal years 2008-

2009 to 2017-2018.

H2. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H3. The combination of the percentage of the total budget spent on the functional classification of instruction and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H4. The percentage of the total budget spent on the functional classification of instruction is a significant predictor of the percentage of on-time student completers for associate degrees at St. Louis Community College (SLCC) during fiscal years 2008-2009 to 2017-2018.

H5. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H6. The combination of the percentage of the total budget spent on the functional classification of instruction and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H7. The percentage of the total budget spent on the functional classification of instruction is a significant predictor of the percentage of on-time student completers for associate degrees at Ozark Technical College (OTC) during fiscal years 2008-2009 to 2017-2018.

H8. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H9. The combination of the percentage of the total budget spent on the functional classification of instruction and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

A series of multiple regression procedures, one analysis for each of the three community colleges' data sets, were conducted with two continuous independent variables (percentage of the total budget spent on the functional classification of instruction and the affordability measure for that institution as defined by MHDE) predicting the continuous dependent variable of the percentage of on-time student completers for associate degrees during fiscal years 2008-2009 to 2017-2018. Each multiple regression analysis tested three hypotheses: one hypothesis for each independent variable separately, and one hypothesis for the combination of those two variables for the overall regression model's predictive ability of the dependent variable. Thus, there were three hypotheses tested for each of the three community colleges. The level of significance for each multiple regression was set at .05.

RQ2. To what extent is there a predictive relationship during fiscal years 2008-2009 to 2017-2018 between the percentage of the total budget spent on the functional classification of academic support and the affordability measure as defined by MHDE during that 10-year period with the percentage for on-time student completers of associate degrees for three similar Missouri community colleges?

H1. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H2. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H3. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H4. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H5. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H6. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H7. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H8. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H9. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

A series of multiple regression procedures, one analysis for each of the three community colleges' datasets were conducted with two continuous independent variables (percentage of the total budget spent on the functional classification of academic support and affordability as defined by MHDE for that institution) predicting the continuous dependent variable of the percentage of on-time student completers for associate degrees during fiscal years 2008-2009 to 2017-2018. Each multiple regression analysis tested three hypotheses: one hypothesis for each independent variable separately, and one hypothesis for the combination of those two variables for the overall regression model's predictive ability of the dependent variable. Thus, there were three hypotheses tested for each of the three colleges. The level of significance for each multiple regression was set at .05.

Limitations

Limitations in research are any restrictions, variables, or phenomena beyond the control of the researcher that could affect the quality of research or the generalization of a study's results. Roberts (2004) included sample size related to survey return rates, methodology issues, and time constraints as possible limitations to a study's

generalizability. Lunenburg and Irby (2008) stressed that it is important to provide the reader with this information to avoid misinterpretation of the findings. A primary limitation of this study was that while Missouri has a performance-based funding model for state aid, the analysis did not evaluate, investigate, or examine the effectiveness of the state funding model as currently designed, and therefore the results of this study cannot be generalized outside of Missouri. Additionally, states, including Missouri, define performance measures for different institutional sectors, and therefore results should not be generalized to other types of post-secondary educational institutions even within Missouri. The sample size for the dataset was also delimited to include three of the 14 community colleges within the State of Missouri. These three institutions were selected due to their similar size and location in metropolitan areas, and the results should not be generalized to smaller community colleges and/or those in rural communities. Another limitation was that the current study only analyzed a 10-year period and the results may or may not hold for years before or after the years of data analyzed. Additionally, the study did not take into account differing levels of student college readiness or specific learning intervention strategies. If the community college had a difference in the level of incoming student readiness or targeted interventions/programs outside of their instructional or academic support budget categories, this study did not consider the impacts of those variables.

Summary

Chapter 3 provided an overview of the research methodology employed for the current study, as well as the purpose of the study. The participants and purposive sample procedures were described, in addition to the collection and sources of the data analyzed

for the study. Finally, Chapter 3 presented the statistical data analysis procedures used to test each of the hypotheses associated with the research questions posed in the current study and stated the limitations of the results.

Chapter 4

Results

The current quantitative study examined the predictive relationship of budgeted expenditures for instruction and academic support, and affordability, with student completion rates within 150% of the expected time for an associate degree at three similar Missouri community colleges for fiscal years 2008-2009 to 2017-2018. By examining the relationship of the types of expenditures and affordability and student completion rates, the results of this study may assist state officials and leaders in higher education make better-informed funding and budgetary decisions. Descriptive statistics and the results of the hypothesis testing are presented in the next section.

Descriptive Statistics

Data were analyzed regarding the percent of budget expenditures for instruction, the percent of budget expenditures for academic support, and the affordability measure as well as the student completion rates for Metropolitan Community College (MCC), St. Louis Community College (SLCC), and Ozark Technical College (OTC). At each of the community colleges studied, there was a change in enrollment reporting that occurred between 2011 and 2012 where the number of students in each cohort substantially increased. Because the change was consistent for all three schools, this would not substantially impact the overall data for comparison purposes since the student completion rates were used as the dependent variable.

As shown in Tables 1, 2, and 3, all three schools experienced growth in the percentage of on-time completers, particularly since 2014. At the same time, the budget

expenditures for instruction were declining and the budget expenditures for academic

support were generally stable. The affordability variable increased minimally from year

to year over the 10-year period.

Table 1

MCC Total Completers by Cohort, Percent of Budget on Instruction, Percent of Budget on Academic Support, and Affordability

Fiscal Year	Cohort	Percentage Growth	Completers	Percentage Completers	Instruction	Academic Support	Affordability
2008	661		156	23.6%			
2009	661	0.0%	123	18.6%	44.3%	12.0%	3.49%
2010	837	26.60%	125	14.9%	44.0%	12.1%	3.49%
2011	915	9.30%	117	12.8%	45.0%	11.9%	3.40%
2012	2134	133.20%	335	15.7%	43.7%	12.3%	3.60%
2013	2835	32.80%	411	14.5%	43.6%	13.1%	3.70%
2014	2638	-5.40%	419	15.6%	41.6%	13.2%	3.70%
2015	2545	-5.10%	468	18.4%	48.3%	17.3%	3.81%
2016	2473	-2.80%	494	20.0%	41.2%	14.4%	3.85%
2017	2236	-9.60%	474	21.2%	38.8%	12.1%	3.86%
2018	2297	2.70%	560	23.5%	39.3%	12.1%	3.91%

Note: IPEDS, Annual Budget and Annual Audit for MCC

As the enrollment began decreasing at MCC in 2014, the percentage of

completers began to rise (see Table 1). During the 10-year time period, the

percent of budget expenditures for instruction declined (5% from 2009 to 2018),

academic support was generally stable (0.1% increase from 2009 to 2018), and

the affordability calculation remained fairly constant increasing only slightly each

year (0.41% increase from 2008 to 2018).

Table 2

SLCC Total Completers by Cohort, Percent of Budget on Instruction, Percent of Budget on Academic Support, and Affordability

Fiscal Year	Total Cohort	Growth in Cohort	Total Completers	Percentage Completers	Instruction	Academic Support	Affordability
2008	480		42	8.80%			
2009	544	13.30%	53	9.70%	48.6%	10.1%	3.67%
2010	483	11.20%	34	7.00%	48.2%	10.3%	3.65%
2011	2669	452.60%	249	9.30%	49.1%	9.7%	3.58%
2012	3092	15.80%	303	9.80%	45.9%	8.9%	3.75%
2013	3480	12.50%	334	9.60%	47.6%	9.2%	4.03%
2014	3165	-9.10%	313	9.90%	48.1%	8.9%	4.14%
2015	2905	-8.20%	298	10.30%	47.1%	9.7%	4.20%
2016	2840	-2.20%	368	13.00%	43.2%	9.8%	4.28%
2017	2509	-11.70%	310	12.40%	45.6%	10.4%	4.28%
2018	2213	-11.80%	346	15.60%	42.9%	9.1%	4.29%

Note. IPEDS, Annual Budget and Annual Audit for SLCC

Similar to MCC, SLCC experienced an increase in total completers as enrollment declined beginning in 2014 (see Table 2). Throughout the 10-year time period, the percent of budget spent on instruction trended down (5.7 % decrease from 2009 to 2018), the percent of budget spent on academic support remained fairly constant (1% decrease from 2009 to 2018), and the affordability calculation remained fairly consistent during these years (0.62% total increase from 2009 to 2018).

Table 3

OTC Total Completers by Cohort, Percent of Budget on Instruction, Percent of Budget on Academic Support, and Affordability

Fiscal Year	Total Cohort	Growth in Cohort	Total Completers	Percentage Completers	Instruction	Academic Support	Affordability
2008	1648		265	16.1%			
2009	1617	-1.9%	239	14.8%	55.8%	14.6%	4.43%
2010	1748	8.10%	278	15.9%	58.4%	14.0%	4.38%
2011	1676	-4.10%	300	17.9%	56.4%	14.4%	4.30%
2012	2418	44.30%	394	16.3%	56.0%	13.2%	4.46%
2013	2638	9.10%	518	19.6%	59.3%	11.9%	4.74%
2014	2381	-9.70%	526	22.1%	59.3%	11.5%	4.96%
2015	2273	-4.50%	537	23.7%	58.6%	13.2%	4.77%
2016	2255	-0.8%	620	29.5%	55.3%	14.3%	5.24%
2017	2210	-2.00%	652	29.5%	53.5%	13.6%	5.35%
2018	1759	-20.40%	506	28.8%	53.9%	13.9%	5.37%

Note. IPEDS, Annual Budget and Annual Audit for OTC

Similar to the Tables 1 and 2 for MCC and SLCC, OTC experienced an increase in total completers as enrollment declined beginning in 2014 (see Table 3). Throughout the 10-year time period, the percent of budget spent on instruction trended down (1.9% decrease from 2009 to 2018), the percent of budget spent on academic support remained fairly constant (0.7% decrease from 2009 to 2018), and the affordability calculation remained fairly consistent (0.94% increase from 2009 to 2019).

The most substantial change among the three independent variables was in the budgeted expenditures for instruction at two of the three community colleges

as summarized in Table 4. The percentage change in academic support was not
substantial over the course of the ten-year period. Additionally, the percent
change in the affordability standard did not substantially change over the ten-year
period.

Table 4

Summary of Percent Change in Instruction Expenditures, Academic Support
Expenditures & Affordability by College over 10 Years

	% Change	% Change	% Change
	Instruction Budget	Academic Support	Affordability
	2009 – 2018	Budget 2009-2018	
MCC	(5.0%)	0.1%	.41%
SLCC	(5.7%)	(1.0%)	.62%
OTC	(1.9%)	(0.7%)	.94%

Based on the descriptive statistics outlined in Tables 5, 6, and 7, the variable of
affordability was the least varied with a standard deviation of less than 1.0 for all three
community colleges. The percent of the budget expended on instruction was the greatest
variance over the ten-year period for all three community colleges, followed by the
percent of the budget expended on academic support.

Between the three community colleges, the mean for the graduation rates varied
considerably.

Table 5

Descriptive Statistics for Instruction, Academic Support & Affordability MCC

	Mean	Std. Deviation	N
Graduation Rate	17.52	3.38	10
Affordability	3.68	0.18	10
Percent Instruction	42.98	2.83	10
Percent Academic Support	13.05	1.69	10

Table 6

Descriptive Statistics for Instruction, Academic Support & Affordability SLCC

	Mean	Std. Deviation	N
Graduation Rate	10.66	2.39	10
Affordability	3.99	0.29	10
Percent Instruction	46.63	2.19	10
Percent Academic Support	9.61	0.56	10

Table 7

Descriptive Statistics for Instruction, Academic Support & Affordability OTC

	Mean	Std. Deviation	N
Graduation Rate	21.81	5.83	10
Affordability	4.80	0.41	10
Percent Instruction	56.65	2.15	10
Percent Academic Support	13.46	1.04	10

Hypothesis Testing and Results

The purpose of the current study was to examine the predictive relationship between two types of budget expenditures, instruction and academic support, and the affordability of tuition and successful student completion at three similar Missouri community colleges. There were two research questions, with three hypotheses for each community college examined. By better understanding the types of variables that have a predictive relationship on student completion, state officials and leaders in higher education can make data-informed funding and budgetary decisions to achieve improved student completion rates. Multiple regression analysis was conducted to determine to what extent there was a predictive relationship between the independent variables of the percent of budget spent on either instruction or academic support with affordability and the dependent variable of on-time graduation rates for each of the community colleges. Chapter 4 provides the results of the research, a restatement of the two research questions and the nine respective hypotheses, and the results of the multiple regression analysis for each hypothesis tested.

RQ1. To what extent is there a predictive relationship during fiscal years 2008-2009 to 2017-2018 between the percentage of the total budget spent on the functional classification of instruction and the affordability measure as defined by MHDE during that 10-year period with the percentage for on-time student completers of associate degrees for three similar Missouri community colleges?

Metropolitan Community College

H1. The percentage of the total budget spent on the functional classification of instruction is a significant predictor of the percentage of on-time student completers for

associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H2. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H3. The combination of the percentage of the total budget spent on the functional classification of instruction and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

Multiple regression with a significance level set at $p < .05$ was conducted with the MCC data from fiscal years 2008-2009 to 2017-2018 to address H1-H3 under RQ1. The analysis tested the extent to which the continuous independent variables of percent of budget spent on instruction and the affordability measure, both separately and combined, could predict the dependent continuous variable of the percent of on-time completers at MCC for the given years. Pearson correlations showed a significant negative association between the percent of budget spent on instruction and the percent of on-time completers ($r = -.563$, $p = .045$), a significant positive association between the affordability measure and the percent of on-time completers ($r = .770$, $p = .005$), and that the two independent variables of the percent of budget spent on instruction and the affordability measure were not significantly correlated ($r = -.508$, $p = .067$). Based on the coefficient analysis, the percent of the budget spent on instruction was not a significant predictor of the percent of on-time completers ($\beta = -.231$, $p = .413$), and H1 was not supported. The affordability measure, however, was a significant predictor of the percent of on-time completers ($\beta = .653$, $p = .044$), supporting H2. For each unit increase in affordability, the percent of

on-time completers increased by .653. The overall results of the analysis indicated a

significant regression model $F(2,7) = 6.036$, $p = .03$ with $R^2 = .528$. The two independent

variables of the percent of the budget spent on instruction and the affordability measure

together explained 52.8% of the variance in the percent of on-time completers for MCC

during fiscal years 2008-2009 to 2017-2018, and H3 was supported.

St. Louis Community College

H4. The percentage of the total budget spent on the functional classification of

instruction is a significant predictor of the percentage of on-time student completers for

associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H5. The affordability measure as defined by MHDE is a significant predictor of

the percentage of on-time student completers for associate degrees at SLCC during fiscal

years 2008-2009 to 2017-2018.

H6. The combination of the percentage of the total budget spent on the functional

classification of instruction and the affordability measure is a significant predictor of the

percentage of on-time student completers for associate degrees at SLCC during fiscal

years 2008-2009 to 2017-2018.

Multiple regression with a significance level set at $p < .05$ was conducted with the

SLCC data from fiscal years 2008-2009 to 2017-2018 to address H4-H6 under RQ1. The

analysis tested the extent to which the continuous independent variables of percent of

budget spent on instruction and the affordability measure, both separately and combined,

could predict the dependent continuous variable of the percent of on-time completers at

STCC for the given years. Pearson correlations showed a significant negative association

between the percent of budget spent on instruction and the percent of on-time completers

($r = -.868$, $p = .001$), a significant positive association between the affordability measure and the percent of on-time completers ($r = .754$, $p = .006$), and that the two independent variables of the percent of budget spent on instruction and the affordability measure were significantly negatively correlated ($r = -.704$, $p = .012$). Based on the coefficient analysis, the percent of the budget spent on instruction was a significant predictor of the percent of on-time completers ($\beta = -.669$, $p = .028$), and H4 was supported. For each one-unit change in the percent of budget spent on instruction, the percent of on-time completers decreased by .669. The affordability measure, however, was not a significant predictor of the percent of on-time completers ($\beta = .283$, $p = .280$), and H5 was not supported. The overall results of the analysis indicated a significant regression model $F(2,7) = 13.481$, $p = .004$ with $R^2 = .735$. The two independent variables of the percent of the budget spent on instruction and the affordability measure together explained 73.5% of the variance in the percent of on-time completers for SLCC during fiscal years 2008-2009 to 2017-2018, and H6 was supported.

Ozark Technical College

H7. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H8. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H9. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor

of the percentage of on-time student completers for associate degrees at OTC during

fiscal years 2008-2009 to 2017-2018.

Multiple regression with a significance level set at $p < .05$ was conducted with the

OTC data from fiscal years 2008-2009 to 2017-2018 to address H7-H9 under RQ1. The

analysis tested the extent to which the continuous independent variables of percent of

budget spent on instruction and the affordability measure, both separately and combined,

could predict the dependent continuous variable of the percent of on-time completers at

OTC for the given years. Pearson correlations did not show a significant association

between the percent of budget spent on instruction and the percent of on-time completers

($r = -.489$, $p = .076$), but did show a significant positive association between the

affordability measure and the percent of on-time completers ($r = .954$, $p = < .01$), and that

the two independent variables of the percent of budget spent on instruction and the

affordability measure were not significantly correlated ($r = -.473$ $p = .084$). Based on the

coefficient analysis, the percent of the budget spent on instruction was not a significant

predictor of the percent of on-time completers ($\beta = -.049$, $p = .710$), and H7 was not

supported. The affordability measure, however, was a significant predictor of the percent

of on-time completers ($\beta = .931$, $p = < .01$), supporting H8. For each one-unit change in

the affordability measure, the percent of on-time completers increased by .931. The

overall results of the analysis indicated a significant regression model

$F(2,7) = 36.349$, $p = < .01$ with $R^2 = .887$. The two independent variables of the percent

of the budget spent on instruction and the affordability measure together explained 88.7%

of the variance in on-time completers for OTC during fiscal years 2008-2009 to 2017-

2018, and H9 was supported.

RQ2. To what extent is there a predictive relationship during fiscal years 2008-2009 to 2017-2018 between the percentage of the total budget spent on the functional classification of academic support and the affordability measure as defined by MHDE during that 10-year period with the percentage for on-time student completers of associate degrees for three similar Missouri community colleges?

Metropolitan Community College

H1. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H2. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

H3. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at MCC during fiscal years 2008-2009 to 2017-2018.

Multiple regression with a significance level set at $p < .05$ was conducted with the MCC data from fiscal years 2008-2009 to 2017-2018 to address H1-H3 under RQ2. The analysis tested the extent to which the continuous independent variables of percent of budget spent on academic support and the affordability measure, both separately and combined, could predict the dependent continuous variable of the percent of on-time completers at MCC for the given years. Pearson correlations did not show a significant association between the percent of budget spent on academic support and the percent of

on-time completers ($r = .110$, $p = .382$), but did show a significant positive association between the affordability measure and the percent of on-time completers ($r = .770$, $p = .005$), and that the two independent variables of the percent of budget spent on academic support and the affordability measure were not significantly correlated ($r = .424$, $p = .111$). Based on the coefficient analysis, the percent of the budget spent on academic support was not a significant predictor of the percent of on-time completers ($\beta = -.264$, $p = .320$), and H1 was not supported. The affordability measure, however, was a significant predictor of the percent of on-time completers ($\beta = .882$, $p = .009$), supporting H2. For a one-unit change in affordability, the percent of on-time completers increased by .882. The overall results of the analysis indicated a significant regression model $F(2,7) = 6.514$, $p = .025$ with $R^2 = .551$. The two independent variables of the percent of the budget spent on academic support and the affordability measure together explained 55.1% of the variance in the percent of on-time completers for MCC during fiscal years 2008-2009 to 2017-2018, and H3 was supported.

St. Louis Community College

H4. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H5. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at SLCC during fiscal years 2008-2009 to 2017-2018.

H6. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor

of the percentage of on-time student completers for associate degrees at SLCC during

fiscal years 2008-2009 to 2017-2018.

Multiple regression with a significance level set at $p < .05$ was conducted with the

SLCC data from fiscal years 2008-2009 to 2017-2018 to address H4-H6 under RQ2. The

analysis tested the extent to which the continuous independent variables of percent of

budget spent on instruction and the affordability measure, both separately and combined,

could predict the dependent variable of the percent of on-time completers at STCC for the

given years. Pearson correlations did not show a significant association between the

percent of budget spent on academic support and the percent of on-time completers

($r = -.187$, $p = .302$), but did show a significant positive association between the

affordability measure and the percent of on-time completers ($r = .754$, $p = .006$), and that

the two independent variables of the percent of budget spent on academic support and the

affordability measure were not significantly correlated ($r = -.160$, $p = .330$). Based on the

coefficient analysis, the percent of the budget spent on academic support was not a

significant predictor of the percent of on-time completers ($\beta = -.069$, $p = .791$), and H4

was not supported. The affordability measure, however, was a significant predictor of the

percent of on-time completers ($\beta = .743$, $p = .021$), supporting H5. For each one-unit

change in affordability, the percent of on-time completers increased by .743. The overall

results of the analysis did not indicate a significant regression model, with

$F(2,7) = 4.691$, $p = .051$. The two independent variables of the percent of the budget

spent on academic support and the affordability measure together only explained 45.1%

of the variance the percent of on-time completers for SLCC during fiscal years 2008-

2009 to 2017-2018, and H6 was not supported.

Ozark Technical College

H7. The percentage of the total budget spent on the functional classification of academic support is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H8. The affordability measure as defined by MHDE is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

H9. The combination of the percentage of the total budget spent on the functional classification of academic support and the affordability measure is a significant predictor of the percentage of on-time student completers for associate degrees at OTC during fiscal years 2008-2009 to 2017-2018.

Multiple regression with a significance level set at $p < .05$ was conducted with the OTC data from fiscal years 2008-2009 to 2017-2018 to address H7-H9 under RQ2. The analysis tested the extent to which the continuous independent variables of percent of budget spent on academic support and the affordability measure, both separately and combined, could predict the dependent variable of the percent of on-time completers at OTC for the given years. Pearson correlations did not show a significant association between the percent of budget spent on academic support and the percent of on-time completers ($r = -.008$, $p = .491$), but did show a significant positive association between the affordability measure and the percent of on-time completers ($r = .954$, $p = < .01$), and that the two independent variables of the percent of budget spent on academic support and the affordability measure were not significantly correlated ($r = -.141$ $p = .349$). Based on the coefficient analysis, the percent of the budget spent on academic support

was not a significant predictor of the percent of on-time completers ($\beta = .129$, $p = .253$), and H7 was not supported. The affordability measure, however, was a significant predictor of the percent of on-time completers ($\beta = .972$, $p = < .01$), supporting H8. For each one-unit change in the affordability measure, the percent of on-time completers increased by .972. The overall results of the analysis indicated a significant regression model $F(2,7) = 44.174$, $p = < .01$ with $R^2 = .906$. The two independent variables of the percent of the budget spent on academic support and the affordability measure together explained 90.6% of the variance in the percent of on-time completers for OTC during fiscal years 2008-2009 to 2017-2018, and H9 was supported.

Summary

Of the 18 hypotheses tested, 11 hypotheses were supported based on the regression analysis results. Five of the six hypotheses regarding the ability to predict the relationship of the affordability measure to predict the percentage of on-time student completions were supported. Only one of the three hypotheses regarding the percentage of the budget spent on instruction was supported and none of the hypotheses regarding the percentage of the budget spent on academic support were supported. All three of the hypotheses regarding the percentage of budget spent on instruction with the affordability measure were supported. Two of the three hypotheses regarding the percentage of budget spent on academic support with the affordability measure were supported. For MCC, the percent of the budget spent on academic support and affordability was a better model than the percent of the budget spent on instruction and affordability for predicting the percent of on-time completions as it accounted for 55.1% of the variance compared to 52.8% for academic support and affordability. For STCC, the percent of the budget spent

on instruction and affordability was a better model than the percent of the budget spent on academic support and affordability for predicting the percent of on-time completions as it accounted for 73.1% of the variance compared to 45%. For OTC, the percent of budget spent on academic support and affordability was a better model than the percent of budget spent on instruction and affordability for predicting the percent of on-time completions as it accounted for 90.6% of the variance compared to 88.7%.

Chapter 5

Interpretation and Recommendations

The purpose of the current study was to examine the predictive relationship between two types of budget expenditures, instruction and academic support, and the affordability of tuition and successful student completion at three similar Missouri community colleges. Chapter 5 contains the study summary, overview of the problem, purpose statement and research questions, review of the methodology, and major findings. The chapter concludes with findings related to the literature, conclusions, implications for action, recommendations for future research, and concluding remarks.

Study Summary. Chapter 1 outlined the need for a more educated workforce and the challenges facing higher education with less funding, reduced enrollment, and lower student completion rates. This study examined three independent variables and their relationships with the dependent variable of student completion rates to help state officials and leaders in higher education make better informed decisions on funding and budgetary expenditures. Chapter 2 included a review of the literature exploring the various aspects of the research topic more thoroughly. There is limited research on the relationship between the budget expenditures for instruction and student completion rates. However, these studies have not considered the relationship between the types of budget expenditures and affordability of tuition with student completion rates. The research design and methods of multiple regression analysis used in the current study are explained in Chapter 3, and the results of the data analysis and hypothesis testing are included in Chapter 4. The next section presents the major findings and recommendations related to the study.

Overview of the problem. According to Berman and Zehngebot (2017), the cost of obtaining a college degree has continued to steadily increase since the 1980's well-outpacing inflation and the salaries for early-career employees. From 2010 to 2020 decade, the number of students enrolling in college has been declining nationwide (Nadworny, 2019). Only about half of the students who enroll in college complete their degrees, yet the need for a more educated workforce has continued to increase (Complete College America, 2017). Most states provide public funding to support institutions of higher education and determine the amount of aid based on funding formulas, many of which are designed to incentivize increased student completion rates while also keeping the cost of a college education more affordable (Uhran & Conroy, 2015). Information about types of budget expenditures by colleges and universities and the affordability of tuition that may have a predictive relationship with student completion rates could be helpful to both state officials and leaders of higher education in their funding and budgetary decision-making processes.

Purpose statement and research questions. The purpose of this quantitative study was to examine the predictive relationship between types of budget expenditures in two functional expenditure categories (instruction and academic support) and affordability of tuition on student completion rates at three similar Missouri community colleges. The study analyzed the percentage of funds budgeted for the functional classifications of instruction and academic support as compared to the total budget with affordability measured by the annual tuition cost related to the median household income for their respective metropolitan statistical area as predictors for on-time student completion rates to complete an associate's degree defined as completion within 150% of

the expected time to complete, or two years for an associate's degree. Data were examined over a 10-year period, between fiscal years 2008-2009 to 2017-2018. The two research questions explored the percentage of the total budget spent on the functional classifications of instruction and academic support independently and with the affordability measure to predict the percentage with on-time student completion rates of associate degrees at three selected Missouri community colleges during a 10-year period.

Review of the methodology. Multiple regression statistical procedures were used to examine the predictive relationship of two different models, each consisting of two independent variables, as well as their combination, and one dependent variable for three similar Missouri community colleges during the fiscal years 2008-2009 to 2017-2018. A separate multiple regression analysis for each of the three selected community colleges' data sets was conducted with two continuous independent variables of the percentage of the total budget spent on instruction and the affordability measure predicting the continuous dependent variable of the percentage of on-time student completion rates of associate degrees during fiscal years 2008-2009 to 2017-2018. A second multiple regression analysis for each of the three selected community colleges data sets was conducted with two continuous independent variables of the percentage of the total budget spent on academic support and the affordability measure predicting the continuous dependent variable of the percentage of on-time student completion rates of associate degrees during fiscal years 2008-2009 to 2017-2018. For each research question, the multiple regression procedure tested three hypotheses for each of the three selected Missouri community colleges: one hypothesis for each independent variable separately, and one hypothesis for the combination of the two independent variables for

the overall regression model's predictive ability of the dependent variable. Thus, there were six hypotheses tested for each of the three selected Missouri community colleges. The level of significance for each multiple regression procedure was set at .05.

Major findings. Research question 1 focused on the predictive relationship between the percentage of the total budget spent on the functional classification of instruction and affordability with the percentage for on-time student completion of associates degrees for three similar Missouri community colleges. The hypothesis testing resulted in significant models at all three schools (MCC 52.8%, St. Louis 73.5% and Ozark 88.7%), with St. Louis rendering the best model to predict student completion rates. Research question 2 focused on the predictive relationship between the percentage of the total budget spent on the functional classification of academic support and affordability with the percentage for on-time student completion of associates degrees for three similar Missouri community colleges. The hypothesis testing resulted in significant models at MCC (55.1%) and Ozark (90.6%), with Ozark rendering the best model to predict student completion rates. Affordability with instruction (Model 1) was better at St. Louis and affordability with academic support (Model 2) better at MCC and Ozark.

Affordability. Of the hypotheses that analyzed affordability as an independent variable or combined with the percent of the budget spent on instruction or academic support, 10 of 12 hypotheses were supported by a significant regression model accounting for 55.1% (MCC), 73.1% (SLCC) and 90.6% (OTC) of the variance. For research question 1, which included the percent of the budget spent on instruction, the results of this study supported two of the three hypotheses regarding the significant association between the affordability measure analyzed independently and on-time

student completion rates (MCC and Ozark). For research question 2, which included the

percent of the budget spent on academic support, the results supported all three of the

hypotheses regarding the significant association between the affordability measure

analyzed independently and the percentage of on-time student completion rates. The

results of this study also supported all three hypotheses for research question 1 indicating

there was a predictive relationship between the total percent of the budget spent on

instruction when combined with the affordability measure with the percentage of on-time

student completions for all three hypotheses. The results of this study also supported two

out of three hypotheses for research question 2 indicating there was a predictive

relationship between the total percent of the budget spent on academic support when

combined with the affordability measure with the percentage of on-time student

completions (MCC and Ozark).

Of note, the net change in the affordability measure was less than 1% over the 10-

year period at all three selected Missouri community colleges. These results indicate that

affordability was consistently a significant predictor for completion rates and therefore,

maintaining an affordable tuition rate with only modest changes at the Missouri

community colleges included in this study proved important to increase student

completion rates. This aligns with the criteria set by MDHE which includes affordability

as a performance measure in the state funding formula discussed in Chapter 2.

Percent of Budget Spent on Instruction. The percent of budget spent on

instruction was only a significant predictor at SLCC ($B = .669, p = .028$). SLCC had

reduced the budget expenditures for instruction substantially over the 10-year period

(5.7%). For each one-unit decrease in the percent of budget spent on instruction, the

percent of on-time completers decreased by .669. The results at SLCC, where the instruction budget had declined the most, suggest that the student completion rates may have been better had the percent of the budget spent on instruction not been reduced by as much. Additionally, for SLCC, the reduction in expenditures was substantial enough to also offset the statistical significance of the affordability variable which was not positively correlated. This research supports that the decline in instructional expenditures of more than 5% negatively impacted student completion rates.

Percent of Budget Spent on Academic Support. When analyzed independently, it was determined that the percent of budget spent on academic support did not have a significant association with student completion rates. The percent of budget spent on academic support alone was not a significant predictor at any of the three schools but was better in combination with affordability- rendering significant beta coefficients at all three schools. As academic support increased one unit, the on-time completers increased by .882 at MCC, .743 at SLCC, and .972 at Ozark. It should be noted that the net change in the percent of the budget spent on academic support did not change more than 1% over the 10-year period at all three colleges. It is possible that because there were such small changes in the expenditures for academic support as compared to the budget as a whole, the changes did not have a statistically significant correlation on student completions. As a note, the results demonstrated that the independent variables of the percent of the budget spent on instruction, the percent of the budget spent on academic support, and affordability were not significantly correlated to one another.

Findings Related to the Literature. Ensuring college tuition remains affordable has been a primary goal of states to maintain low cost of post-secondary education so that

it does not become a barrier to student enrollment and completion (Dougherty, et al., 2016). In Missouri, it has become one of the performance measures that helps determine how much state funding each college is allocated (MDHE, 2019). As noted, community colleges are uniquely positioned to help students pursue an advanced degree given their lower tuition costs and funding from the state to subsidize the costs, and a significant number of new students are enrolling in community colleges to begin their degree programs (Pratt-Kelly, 2020). The data analysis results for the current study support that the variable of affordability should continue to be a performance measure in light of the goal to increase student completion rates. However, the results do not support requiring institutions to direct state funds to either instruction or academic support expenditure categories to increase student completion rates.

At the same time, given the negative significant Pearson correlation of reduced expenditures in instruction and student completion rates at the two colleges that had substantial reductions in instructional expenditures, the results support previous research that indicated reduced instructional resources per student negatively impacted student completion rates (Bound, Lovenheim, & Turner, 2010). For the two institutions with substantial reductions in budget expenditures for instruction (MCC and SLCC), the number of total students enrolled had also declined (MDHE, 2019). At SLCC, the percentage of student completion rates began to increase in 2013, while the number of new full-time students enrolled had declined by 19% and the number of total students had declined by 8%. During the same time period, the percent of budget spent in instruction had declined by 8% relative to other expenditure categories. However, upon reviewing the underlying data, the expenditures went from $78.5 million to $66.8 million, or a

dollar reduction of 15%. The total budget expenditures per full-time student increased during that time period ($24,815 to $30,185), partially explaining why completion rates were increasing, while the funds spent per student for all students during that time period remained fairly constant ($3,701 to $3,679).

Conclusions. Data analysis for the current study rendered statistically significant results that supported maintaining the affordability of tuition as it substantially impacted student completion rates at the three Missouri community colleges studied. Results revealed analysis rendered in this study a significant predictive regression model of research question 1 when considering the percentage of the budget spent on instruction and the affordability measure predicting student completion rates at all three colleges studied. Results also revealed a better data analysis rendered in this study a significant predictive regression model of research question 2 considering the percent of the budget spent on academic support and the affordability measure predicting student completion rates at two of the three community colleges as the second model accounted for higher percentages of the variance in the percent of on-time completers. Likewise, the results of the study support that substantial reductions in budget expenditures for instruction had an adverse impact on student completion rates.

Implications for action. Resources for institutions of higher education continue to be strained by increasing operational costs, limited public funding, and student demands for affordable tuition. Students are seeking an affordable education that will lead to a good-paying job upon completing their degree (Kelchen & Meadows, 2016). Many public officials want to ensure public dollars are being spent in ways to achieve higher student completion rates (Dougherty, et al., 2016), and many employers are

demanding a higher educated and better-skilled workforce (Kelchen & Meadows, 2016).

Results of the current study support having an affordability requirement as part of the

Missouri funding performance model for community colleges because of its positive

predictive relationship with student completion rates. The results of this current study

support the state considering limitations on substantial reductions in expenditures for

instruction. In Missouri, the performance funding model already includes affordability as

part of the criteria and findings of this study support that should continue. A further

enhancement of the Missouri funding formula may be to prioritize affordability as a

weighted consideration to receive increased state funding, as state funding has a direct

impact on tuition rates and affordability. The percentage of budget spent on instruction

or any expenditure category was not addressed in the funding formula in Missouri at the

time of this study. The results of this research support limiting budget reductions in the

category of instruction at no more than 5% over a 10-year period. At minimum, the

results of this study support the need for leaders in higher education in Missouri to be

mindful of the cost of tuition and the impact substantial reductions in budget expenditures

for instruction may have on student completion rates as funding decisions are made; and

research should continue to track these data points moving forward.

Additionally, it is important for colleges to consider the area economy in making

tuition and fee decisions annually as a best business practice. The performance measure

used by MDHE to determine affordability is a comparison of the tuition rates and the

household income. A consideration of colleges when setting tuition rates typically is

focused on the cost of doing business, including the increasing costs of salaries and

benefits, particularly health insurance, and operational costs such as utilities. Although

the increasing costs of operating a college must be a consideration, ensuring the tuition rates do not outpace changes in household income is also an important perspective for colleges as they consider setting new tuition rates each year given the results of this study.

Recommendations for future research. As results of the current study revealed a predictive relationship between affordability and budget expenditures in instruction at three selected Missouri community colleges included in the current study, further analysis of the other Missouri community colleges should be undertaken to determine if the size and geographic locations of the colleges would change the results. Additional research regarding the way colleges use the funds within the budget expenditure category of instruction should be undertaken to examine whether some initiatives have been more effective than others at the selected three Missouri community colleges, especially since all three had increasing student completion rates over the 10-year period. When considering the variable of budget expenditures on instruction, the results of this study demonstrated there is a negative relationship between substantial reductions in budget expenditures for instruction and student completion rates. Additional research should be conducted on specific reductions that were employed such as larger class size and lower student-to-instructor ratios, increased use of part-time faculty versus full-time faculty, or other factors that may have resulted in the budget expenditure reductions and specifically impacted student completion rates. Other variables not examined for the current study may have also influenced these results. For example, a higher number of part-time students, students with developmental education needs, or instructional expenditures in certain degree or certification programs, etc. could have impacted the data analysis

results. Research on student variability and the relationship with student outcomes would also be beneficial. Because the overall student completion rate was increasing over the 10-year period at all three community colleges, more research to better understand more specific factors that led to these increases would be beneficial. Based on the results of the current study, a more in-depth review of new initiatives or approaches at these three institutions should be undertaken to explore whether there were certain initiatives or specific types of instructional expenditures common to all three that might be related to improving student outcomes.

Additional research should be conducted on other categories of functional expenditures including student services, student activities, and institutional support to explore their relationships with student completion rates. As many community colleges also offer certificate workforce training programs, this study could be replicated with on-time student completion of certificate programs rather than degree programs as the dependent variable. This would offer additional insights into the performance-based funding strategy in Missouri.

Concluding remarks. President Obama connected the importance of higher education to the nation's economy when he stated, "Education is an economic issue when nearly eight in 10 new jobs will require workforce training or a higher education by the end of this decade. Education is an economic issue when we know beyond a shadow of a doubt that countries that out-educate us today, they will out-compete us tomorrow" (Obama, 2010, para. 15). Employers are needing a more educated workforce to support the national economy and therefore, ensuring the cost of higher education is affordable and not a barrier to enrollment in post-secondary education is critical (Complete College

America, 2017). Maintaining affordability for enrollment in college becomes even more important given the growing gap between the increase in tuition and the corresponding increase in student debt, and stagnant starting salaries in the workplace as seen in Chapter 2 (Berman & Zehngebot, 2017). Community colleges play an important role in providing access to an affordable post-secondary education (The Princeton Review, 2017).

As leaders in higher education struggle with the issues of affordability of tuition, declining student enrollment, and declining state funding while also attempting to meet state performance measures, it is imperative that data regarding student outcomes can inform budgetary decisions. This study highlighted the significant impact affordability of tuition has on student completion rates. Additionally, the results of this study found that significant decreases in instructional budgets could adversely affect student completion rates. The results of this study can assist leaders at the three community colleges examined to make better decisions regarding future tuition increases and budget expenditures.

References

Anderson, L. & Keily, T. (2018, October). Approaches to state workforce development systems. *Education Commission of the States.* Retrieved from https://www.ecs.org/research-reports/key-issues/workforce-development/

American Association of State Colleges and Universities (2018). Top 10 higher education state policy issues for 2018. *Policy Matters*. Retrieved from https://www.aascu.org/policy/publications/policy-matters/Top10Issues2018.pdf

Bailey, T., Jeong, D. W., & Cho, S. I. (2010). Referral, enrollment and completion in developmental and educational sequences in community colleges. *Economics of Education Review, 29,* 255-270. doi:10.1016/j.econedurev.2009.09.002

Berman, J. & Zehngebot, J. (2017, November 21). Paying for your college, 30 years ago vs. today. *Marketwatch.* Retrieved from https://www.marketwatch.com/graphics/college-debt-now-and-then/

Bound, J., Lovenheim, M, & Turner, S. (2010, July). Why have college completion rates declined? An analysis of changing student preparation and collegiate resources. *American Economic Journal, Applied Economics, 2(3).* Retrieved from https://search.proquest.com/docview/871984695?pq-origsite=gscholar&fromopenview=true

Bound, J. & Turner, S., (2007, June). Cohort crowding: How resources affect collegiate attainment. *Journal of Public Economics, 91, 5-6.* Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0047272706001137

Center for Community College Student Engagement. (2012). *A Matter of Degrees:*

Promising Practices for Community College Student Success [White paper].

Austin, TX: The University of Texas at Austin, Community College Leadership

Program. Retrieved from https://www.ccsse.org/docs/Matter_of_Degrees.pdf

College Tuition Compare (2020). *2020 tuition comparison between 2 but less than 4-*

year colleges in Missouri. Retrieved from

https://www.collegetuitioncompare.com/compare/tables/?state=MO&level=2%20

but%20less%20than%204-year

Community College Research Center (2020). *The role of the community college.*

Retrieved from https://ccrc.tc.columbia.edu/the-role-of-the-community-

college.html

Complete College America (2017). *Reduce time and accelerate success.* Retrieved from

http://www.completecollege.org/docs/CCA%20Essential%20Steps%20Reduce%2

0Time%20and%20Accelerate%20Success.pdf

Cooney, P. (2017, September 6). What actually predicts college success? *Michigan*

Future Inc., Retrieved from https://michiganfuture.org/09/2017/actually-predicts-

college-success/

Cooper, P. (2018, June 11). What predicts college completion? High school GPA beats

SAT score. *Forbes.* Retrieved from

https://www.forbes.com/sites/prestoncooper2/2018/06/11/what-predicts-college-

completion-high-school-gpa-beats-sat-score/#3701ee194b09

Department of Homeland Security (2012, March 13). *What is community college?*

Retrieved from https://studyinthestates.dhs.gov/2012/03/what-community-college

DiscoverPhDs (2020, October 2). *Scope and Delimitations – Explained & Example*.

Retrieved from https://www.discoverphds.com/blog/scope-and-delimitations

Dougherty, K., Jones, S., Lahr, H., Natow, R., Pheatt, L., & Reddy, V. (2016, April).

Looking inside the black box of performance funding for higher education: policy

instruments, organizational obstacles, and intended and unintended impacts.

Teachers College, Columbia University. Retrieved from

https://ccrc.tc.columbia.edu/publications/looking-inside-black-box-performance-

funding-higher-education.html

Dougherty, K. & Reddy, V. (2011). The impacts of state performance funding systems on

higher education institutions: research literature and policy recommendations.

Teachers College, Columbia University. Retrieved from

https://ccrc.tc.columbia.edu/publications/impacts-state-performance-

funding.html-

Dougherty, K. & Reddy, V. (2013). Performance Funding for Higher Education.

Teachers College, Columbia University. Retrieved from

https://ccrc.tc.columbia.edu/publications/performance-funding-mechanisms-

impacts.html

El Fattal, D. (2014). *To what degree does money matter for student success? A quantitative examination of the relationships between institutional expenditures and student success outcomes* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global: The Humanities and Social Sciences Collection database. (ProQuest No. 3581492)

Flaherty, C. (2013, November 15). Net zero. *Inside Higher Ed*, Retrieved from https://www.insidehighered.com/news/2013/11/15/study-finds-no-impact-student-success-having-adjunct-instructors

Glass, G. V., & Smith, M. L. (1979). Meta-analysis of research on class size and achievement. *Educational Evaluation and Policy Analysis*, *1*(1), 2-16. Retrieved from https://www.classsizematters.org/wp-content/uploads/2016/09/Glass-and-Smith.pdf

Governmental Accounting Standards Board (2020, July). *About the GASB*. Retrieved from https://www.gasb.org/aboutgasb

Hanover Research (October 2014). Best Practices in Retention at Community Colleges. *Hanover Research.* Retrieved from https://www.hanoverresearch.com/wp-content/uploads/2017/08/Best-Practices-in-Retention-at-Community-Colleges.pdf

Harrington, M., Lloyd, A., Smolinksi, T., & Shahin, M., Closing the gap: First year success in college mathematics at an HBCU. *Journal of the Scholarship of Teaching and Learning,* Vol. 16, No. 5, October 2016, pp. 92-106. doi: 10.14434/josotl.v16i5.19619. Retrieved from https://files.eric.ed.gov/fulltext/EJ1118784.pdf

Hearn, J. (2015, November). Outcomes-based funding in historical and comparative

    context. *Lumina Foundation.* Retrieved from

    https://www.luminafoundation.org/files/resources/hearn-obf-full.pdf

Hillman, N. (2016, May 25). Why performance-based college funding doesn't work. *The*

    Century Foundation. Retrieved from https://tcf.org/content/report/why-

    performance-based-college-funding-doesnt-work/?agreed=1

Hillman, N., Tandberg, D., & Fryar, A. (2015, December). Evaluating the impacts of

    "new" performance funding in education. *Educational Evaluation and Policy*

    Analysis. Retrieved from

    https://journals.sagepub.com/doi/abs/10.3102/0162373714560224?journalCode=e

    paa

Hillman, N., Tandberg, D., & Gross, J. (2014, Nov-Dec). Performance funding in higher

    education: Do financial incentives impact college completions? *The Journal of*

    Higher Education, 85(6) p. 826-857. Retrieved from

    https://eric.ed.gov/?q=%22Hillman+Nicholas%22&ff1=autGross%2c+Jacob+P.+

    K.&id=EJ1043674

Isbell, T. (2014). *The relationship between institutional expenditures and student*

    completion of momentum points: A community college perspective (Doctoral

    dissertation). Retrieved from ProQuest Dissertations & Theses Global: The

    Humanities and Social Sciences Collection database. (ProQuest No. 3727169)

Johnson, E. (2019, November 4). Another drop in college readiness. *Inside Higher Ed.*

> Retrieved from

> https://www.insidehighered.com/admissions/article/2019/11/04/act-shows-

> decline-students-ready-college

Kelchen, R. & Meadows, K. (2016). Education under review: examining the value of

> education for student success in career and life [White paper]. *The Chronicle of*

> *Higher Education.* (p. 1-32). Retrieved from

> https://www.ellucian.com/assets/en/white-paper/student-success-chronicle-

> education-under-review.pdf

Kelderman, E. (2017, July 25). On administrative spending, which colleges get the most

> bang for the buck? *The Chronicle of Higher Education*. Retrieved from

> http://www.chronicle.com/article/on-administrative-

> spending/240728?cid=at&elqTrackId=620a66eb52524f96b639a…&utm_medium

> =en&utm_source=at

Kraemer, J. (2019, May 9). Statistic of the month: Comparing community college

> completion rates. *National Center on Education and the Economy*. Retrieved

> from http://ncee.org/2013/05/statistic-of-the-month-comparing-community-

> college-completion-rates/

Leonhardt, (2020, September 17). The college money crisis. *The New York Times*.

> Retrieved from https://www.nytimes.com/2020/09/17/briefing/cdc-wildfires-

> barack-obama-your-thursday-briefing.html

Lunenburg, F. & Irby, B. (2008). *Writing a successful thesis or dissertation: Tips and strategies for students in the social and behavioral sciences*. Newbury Park, CA: Corwin Press.

Ma, J. & Baum, S. (2016, April). Trends in community colleges: enrollment, prices, student debt, and completion. *College Board Research.* Retrieved from https://trends.collegeboard.org/sites/default/files/trends-in-community-colleges-research-brief.pdf

MacKellar, E. (2016, September). Performance-based budgeting in the states. *NCSL, 24(35).* Retrieved from https://www.ncsl.org/research/fiscal-policy/performance-based-budgeting-in-the-states.aspx#:~:text=Thirty-one%20states%20use%20performance-based%20budgeting%20for%20at%20least,collection%20is%20key%20to%20successfully%20implementing%20performance-based%20budgeting

Maldonado, C. (2018, July 24). Price of college increasing almost 8 times faster than wages. *Forbes*. Retrieved from https://www.forbes.com/sites/camilomaldonado/2018/07/24/price-of-college-increasing-almost-8-times-faster-than-wages/#58e489266c1d

Mellow, G. & Heelan, C. (2015). *Minding the Dream: The process and practice of the American community college, 2nd Edition.* Landham, Maryland: Rowman & Littlefield.

Missouri Community College Association. (2020). *What defines a community college?* Retrieved from http://www.missouricolleges.org/about.html

Missouri Community College Association (2017). Missouri community college fast facts. *Missouri Community College Association.* Retrieved from http://www.mccatoday.org/assets/advocacy_toolkit/fastfacts_letter_officeprinter_blocks.pdf

Missouri Department of Higher Education (2015, July 1). *State of Missouri Performance Funding for Higher Education, Vol. 3.* Retrieved from http://dhe.mo.gov/documents/PerformanceFundingPublicationVo32015.pdf

Missouri Department of Higher Education. (2016a). *Preparing Missourians to Succeed: A Blueprint for Higher Education.* Retrieved from https://dhewd.mo.gov/blueprint.php

Missouri Department of Higher Education. (2016b). *Missouri Public Higher Education Institutions Appropriations, 2007 – 2016.* Retrieved from http://dhe.mo.gov/about/legislative/documents/WebFY02thrupresentinstitutionapprop.pdf

Missouri Department of Higher Education. (2017). *A+ scholarship program.* Retrieved from http://dhe.mo.gov/ppc/grants/aplusscholarship.php

Missouri Department of Higher Education. (2018, January 1). *State of Missouri Performance Funding for Higher Education, Vo.5.* Retrieved from https://dhewd.mo.gov/documents/performancefunding2018.pdf

Missouri Department of Higher Education (2019. *Annual Report 2019.* Retrieved from https://dhewd.mo.gov/about/2019annualreport.php

Mueller, B., Mandernach, B., & Sanderson, K., (2013, September). Adjunct versus full-
time faculty: a comparison student outcomes in the online classroom. *Merlot
Journal of Online Learning and Teaching*, Vol, 9(3). Retrieved from
https://jolt.merlot.org/vol9no3/mueller_0913.pdf

Nadworny, E. (2019, December 16). Fewer students are going to college. Here's why that
matters. *National Public Radio, Morning Edition.* Retrieved from
https://www.npr.org/2019/12/16/787909495/fewer-students-are-going-to-college-
heres-why-that-matters

National Association of College and University Business Officers, (2020). Retrieved
from https://www.nacubo.org/about/who-we-are

National Center for Education Statistics (2020a). *What is IPEDS?* Retrieved from
https://nces.ed.gov/ipeds/Home/AboutIPEDS

National Center for Education Statistics. (2020b). *Postsecondary education, appendix B:
Definitions of NACUBO and OMB circular A-21 functional categories.* Retrieved
from
https://nces.ed.gov/pubs2006/ficm/content.asp?ContentType=Appendix&appendi
x=B

National Center for Education Statistics. (2020c). *Characteristics of postsecondary
faculty.* Retrieved from https://nces.ed.gov/programs/coe/indicator_csc.asp

National Center for Education Statistics. (2016, December). *IPEDS graduation rates.*
Retrieved from https://nces.ed.gov/pubs2017/2017046.pdf

Obama, B. (2010, August 10). Education: the economic issue of our time. *The White House President Obama.* Retrieved from https://obamawhitehouse.archives.gov/photos-and-video/video/2010/08/10/education-economic-issue-our-time#transcript

Pan, D., Rudo, Z., Schnieder, C., & Smith-Hansen, L. (2003, April). Examination of resource allocation in education: Connecting spending to student performance research report. *Southwest Educational Development Laboratory.*

Pratt-Kielley, E. (2020, February). 12 questions answered for parents of students considering community colleges. *Today.com.* Retrieved from https://www.today.com/parenting-guides/12-questions-about-community-college-answered-t177500

Ran, F. and Sanders, J. (2020, January-March) Instruction Quality or Working Condition? The effects of part-time faculty on student academic outcomes in community college introductory courses. *AERA Open. 6(1).* Retrieved from https://journals.sagepub.com/doi/pdf/10.1177/2332858420901495

Snyder, M. (2015). Driving better outcomes: Typology and principles to inform outcomes-based funding models. *HCM Strategists.* Retrieved from http://hcmstrategists.com/drivingoutcomes/wp-content/themes/hcm/pdf/Driving%20Outcomes.pdf

Snyder, M. & Fox, B. (2016). Driving better outcomes: Fiscal year 2016 state status & typology update. *HCM Strategists.* Retrieved from http://www.HCMStrategist.com

Tandberg, D. A., Hillman, N., & Barakat, M. (2014). State Higher Education

    Performance Funding for Community Colleges: Diverse Effects and Policy

    Implications. *Teachers College Record*, *116(12), 12*. Retrieved from

    https://eric.ed.gov/?id=EJ1044657

Terry, J. W. (2011). *Where does money matter: The impact of expenditures on student*

    achievement? (Doctoral dissertation). Retrieved from ProQuest Dissertations &

    Theses Global: The Humanities and Social Sciences Collection database.

    (ProQuest No. 3467971)

The Economist (2014, April 5). Is college worth it? Retrieved from

    https://www.economist.com/united-states/2014/04/05/is-college-worth-it

The Princeton Review (2017). *4 reasons to consider community college.* Retrieved from

    https://www.princetonreview.com/college-advice/community-college

Tigro, E., (June 20, 2011). How outcomes-based funding will affect students and

    professors. *Education Insider Newsblog.* Retrieved from

    http://study.com/articles/How_Outcomes-

    Based_Funding_Will_Affect_Students_and_Professors.html

Top Universities. (2020). *What's an associate degree?* Retrieved from

    https://www.topuniversities.com/blog/what-associate-degree

Uhran, S. & Conroy, T. (2015). Federal and state funding of higher education. *The Pew*

    Charitable Trusts. Retrieved from

    http://www.pewtrusts.org/~/media/assets/2015/06/federal_state_funding_higher_e

    ducation_final.pdf

Wai, J. (2019, February 18). What is the purpose and future of higher education: A

    sociologist explores the history and future of higher education. *Psychology Today.*

    Retrieved from https://www.psychologytoday.com/us/blog/finding-the-next-

    einstein/201902/what-is-the-purpose-and-future-higher-education

Wenglinsky**,** H. (1997). *When money matters: How educational expenditures improve*

    student performance and how they don't. Retrieved from

    https://eric.ed.gov/?id=ED412271

Baker University Institutional Review Board

November 18ᵗʰ, 2020

Dear Shelley Kneuvean and Judy Korb,

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

Please be aware of the following:

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

If you have any questions, please contact me at npoell@bakeru.edu or 785.594.4582.

Sincerely,

Nathan Poell, MLS
Chair, Baker University IRB

Baker University IRB Committee
    Sara Crump, PhD
    Nick Harris
    Christa Manton, PhD
    Susan Rogers, PhD