THE IMPACT OF PERFORMANCE FUNDING ON RETENTION AND GRADUATION METRICS AT FOUR-YEAR PUBLIC UNIVERSITIES IN MISSOURI BETWEEN 1993 AND 2018

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Doctor of Education

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by

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled:

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a candidate for the degree of doctor of education

and hereby certify that, in their opinion, it is worthy of acceptance

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DEDICATION

This dissertation is dedicated to my family, first and foremost, to my wonderful wife Ann. Without Ann I would not have made it through this program, her constant words of encouragement, her belief in my success, and her generosity for allowing me the time to dedicate to this endeavor have only made me love you more. To my parents, Jo and Gerda, who have always had faith in me to succeed, no matter the obstacles. I would also like to thank my more extended family, for their continuous inquiry into my work, and for all the words of encouragement I have received from them.

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ABSTRACT

Performance funding has been a popular form of funding colleges and universities for several decades. Often the purpose is to make universities more efficient (Miao, 2012). Missouri has had two separate models of performance funding in play, a decade apart. In this research both performance funding models are examined, including a 10-year period when no performance funding model was in place, to see if there has been an impact on retention and graduation metrics at four-year public institutions in Missouri. The organization of higher education in Missouri is examined through Weick's (1978/1983) loosely coupled systems to better understand the components of the system. Using publicly available retention and graduation data from the 13 public universities, a quantitative analysis using an ANOVA is used to see if there is a significant difference in retention and graduation rates between the three funding models.

Keywords: performance funding, finance, higher education, retention, graduation, Missouri.

SECTION ONE – INTRODUCTION TO THE DISSERTATION-IN-PRACTICE

Section one provides a roadmap for the dissertation in the form of an introduction to the dissertation-in-practice. First, the researcher will introduce the background of the study. The statement of the problem follows this. Next, the researcher will address, the purpose of the study, the research questions, and the conceptual and theoretical frameworks. Lastly, the design of the study, the significance of the study, and the summary will be illustrated.

Introduction to the Background of the Study

Funding in higher education has seen many different trends over the past decades, including calls for privatization, performance funding models, and exploration of alternative revenue streams (Umbricht, Fernandez, & Ortagus, 2017). Over time, states have invested less in higher education, which has driven up tuition and reduced quality (Mitchell, Leachman, & Masterson, 2017). Parallel to less capital investment, both states and other organizations are trying to find ways in which to increase degree attainment in the United States of America (Perna & Finney, 2014).

The concept and idea of what we now recognize as performance funding was first introduced as performance budgeting by the Hoover Commission in the 1950s and applied to a variety of government functions (Jordan & Hackbart, 1999). Performance-funding for higher education as we know it regained popularity out of this performance budgeting movement in the 1990s due to the New Accountability movement (Hillman, Tandberg, & Fryar, 2015). By the early 2000s, many states abandoned performance funding, in part due to a lack of financial and political support (Dougherty, Natow, Bork, Jones, & Vega, 2013). Eventually, in the mid-2000s, performance funding regained

momentum due to support from the Bill and Melinda Gates Foundation, Lumina Foundation, National Governors Association, Complete College America, and National Conference of State Legislatures (Hillman et al., 2015). The Bill and Melinda Gates Foundation has had a focus on accountability for higher education as well as an agenda to increase degree attainment at all levels of education (Saltman, 2010). While other organizations, such as Complete College America, have attempted to fix certain remedial coursework, encouraging institutions through data accountability to change their practices (Vandal, 2014). Financial support from these groups made new data metrics available, including average time to completion and credit hours earned per degree, that previously were not collect nor published by institutions of higher education (McPherson & Shulenburger, 2006).

Most performance funding models attempt to assess higher education institutions based on output measures such as retention, graduation, course completion, degree completion, and placement, instead of inputs such as enrollment (Dougherty et al., 2013). According to Burke and Modarresi (2000), to truly understand a performance funding model, which often vary from one state to another, one needs to answer first the *what* and *how* performance is measured and to what purpose. Most performance funding models see influences from political movements within a state (Burke & Modarresi, 2000; Dougherty et al., 2013; Hillman et al., 2015). Some models, such as the Tennessee model which includes rewards for helping marginalized populations, have longevity while other models have been redesigned, such as the Indiana model, and others never got off the ground, as was the case in Iowa (Umbricht et al., 2017).

Missouri's initial performance funding system saw its introduction in the early 1990s, but the State of Missouri abandoned this system of funding in 2002 (Dougherty et al., 2013). In 2022, the State of Missouri has a new performance funding model in place, which was adopted by the Missouri Coordinating Board of Higher Education in 2012 (Performance Funding in Missouri, n.d.). The State of Missouri also has a blueprint for higher education that includes five goals, one of which is to increase degree attainment by 2025 (A Coordinated Plan for Higher Education in Missouri, n.d.). Rutherford and Rabovsky (2014) have shown that performance-based funding policies do not always lead to higher student performance, and they found that in the long term, it may even negatively impact student performance. Based on previous research, the question is brought forward of whether the current performance funding model in the State of Missouri has had an impact on retention and graduation rates?

Statement of the Problem

The current performance funding model adopted in the State of Missouri has not been examined by other researchers to see if it has an impact on degree attainment in Missouri, which the State set a goal to increase to 60% by 2025 (A Coordinated Plan for Higher Education in Missouri, n.d.). Research from Hillman, Tandberg, and Gross (2014) suggest that in Pennsylvania, performance funding did not have a positive impact on degree completion. Also, research from Rutherford and Rabovsky (2014) shows that between 1993 and 2010, performance funding had "very little direct effect on student outcomes" (p. 205). Others, however, have shown that resource allocation based on the performance by an institution can have a short-term positive impact on student success (Liefner, 2003).

Each model of performance funding is different. Some vary slightly, while others vary greatly, and thus it is crucial to study the model used in Missouri and its impact to inform the state, the institutions, and the public better whether funding policies align with degree attainment policies set in the State of Missouri. Differences in these models range from what they measure to how to account for equity (Hazelkorn, 2015). Equity in this case refers to the equal funding among institutions of public higher education. Some models focus heavily on student success measures such as retention, graduation, and placement, while other models focus on operational efficiency measures (Hillman et al., 2014). For example, one of the measures based on operational efficiency in Missouri's model tracks the increase in employee salary outlays and whether it stays below the increase in median household income, a measure that will examine if institutions are raising salaries faster compared to the median household income of families in Missouri (Performance Funding in Missouri, n.d.). Models also show varying impacts in funding; specific models only distribute new dollars to institutions while other models also redistribute existing funds (Hazelkorn, 2015).

Research from Burke and Modarresi (2000) indicated that the early 1990s model utilized in Missouri had succeeded in increasing performance, limited knowledge exists about the more recently adopted performance funding model in the state of Missouri. Examining the literature between various performance funding models has shown that some performance funding models seem to show results while others do not (Hazlkorn, 2015; Rutherford & Rabovsky, 2014; Umbricht et al., 2017). As addressed by Hillman et al. (2014), this is due to the realization that performance funding models are often politically driven and hard to compare as each model tries to achieve different outcomes.

Performance funding models are consistently inconsistent in policy goals, design, implementation, and results. Therefore, a gap of knowledge exists that addresses whether the current performance funding model in the state of Missouri has an impact on metrics such as retention and graduation.

Purpose of the Study

The purpose of this study is to examine the impact of performance funding policy in the State of Missouri on public higher education institution retention and graduation rates from 1993-2018. The State of Missouri has both a policy to fund higher education institutions based upon their performance and a policy to increase degree attainment, therefore research should be conducted to see if these policies together achieve the goals of the State of Missouri. Performance funding policy was introduced through the legislature in 2012 and is administered by the Missouri Department of Higher Education and Workforce Development (Performance Funding in Missouri, n.d.). This model is referred to in this study as v.2. The goal to increase degree attainment in Missouri comes from the blueprint for higher education in Missouri, which the Department of Higher Education and Workforce Development released in 2016 (A Coordinated Plan for Higher Education in Missouri, n.d.). The performance funding model approved by the Missouri State legislature utilizes six metrics, listed in Table 1.

Table 1

Performance Funding Measures in Missouri for Four-Year Public Institutions (v.2).

Metric	Description
1.	Completions per full-time equivalent student (FTE).
2.	Percent of students meeting or exceeding the established benchmark threshold on one of the following assessments, 1) improvements in assessment of general education, 2)

	improvements in assessments in the major field, and 3) improvements on professional/occupational licensure tests.
3.	Total operating salaries per student FTE as percent of statewide median household income.
4.	Percent of total education and general expenditures expended on the core mission (instruction, research, and public service).
5.	Net tuition and fee revenue from Missouri undergraduate residents per Missouri undergraduate student FTE as a percent of statewide median household income.
6.	Percent of students employed full time, participating in a volunteer or service program, serving in the military, or enrolled in continuing education in the six months following graduation.

Although only one of the six measures in the performance funding model directly focuses specifically on degree attainment, all six measures will be in the analysis since all measure have an impact on the monies an institution receives.

The model used prior to this, which was in existence from 1993 to 2002 recommended incentive funding in 1992 related to institutions performance on the measures listed in Table 2 (J. Kintzel, personal communication, May 4, 2021). This model is referred to in this study as v.1.

Table 2

Recommended Performance Funding Measures (v.1).

Metric	Description
1.	Implement admission decisions appropriate to institutional mission.
2.	Increase student performance in general education and the major field of study.
3.	Increase participation and graduation of historically underserved populations, particularly minorities, as well as increasing the proportion of faculty and staff from historically underrepresented populations.
4.	Increasing institutional graduation and time-to-completion rates, particularly in critical high-skill trades and disciplines.
5.	Encouraging students to continue their formal education through transfer or post-baccalaureate study.
6.	Developing distinctive programs and more focused missions.

7. Achieving administrative efficiency goals.

In more detail, this study will examine all four-year public institutions in the State of Missouri. In Missouri, this means nine individual institutions and one multi-city, multi-campus system, the University of Missouri, which consists of four institutions, will be examined to see the impact of performance funding on retention and graduation rates. The researcher will use information from each of the four individual institutions that make up the University of Missouri System to match the performance funding methodology. Table 3 below shows each of the participating institutions/system.

Table 3

Four-Year Public Institutions/Systems.

Institution/System	Type
Harris-Stowe State University	Individual Institution
Lincoln University	Individual Institution
Missouri Southern State University	Individual Institution
Missouri State University	Individual Institution
Missouri Western State University	Individual Institution
Northwest Missouri State University	Individual Institution
Southeast Missouri State University	Individual Institution
Truman State University	Individual Institution
University of Central Missouri	Individual Institution
University of Missouri	University System
University of Missouri-Columbia	
University of Missouri-Kansas City	
Missouri University of Science and Technology	
University of Missouri-St. Louis	

Missouri State University, which also operates a two-year community college, will only have the four-year university part examined in this study, this also matches the method of

assessment used in the performance funding model. The two-year community college located in West Plains operated by Missouri State University is funded using the same metrics on performance funding as the other two-year public community colleges in the state, which are not being examined in this study.

Research Questions

The table below presents the research questions directing this study. The first question examines whether the State public universities demonstrated statistically significant difference in undergraduate retention rates when considering three eras of different funding models. Version 1 (v.1) was in place from 1993 till 2002, version 2 (v.2) has been implemented since 2014, and the era between 2002 and 2014 is considered the years with no model (v.N). These three models of funding were utilized in Missouri between 1993 and 2018. The second question will focus on what the impact has been on graduation rates in the State of Missouri. Each model will be compared to the retention and graduation rates covering the time frame that the model was in place.

Table 4

Research Questions

Question Number	Question
1.	Does performance funding policy have an impact on retention rates at Missouri's four-year public institutions between 2003 and 2018? (v.N, and v.2)
2.	Does performance funding policy have an impact on graduation rates at Missouri's four-year public institutions between 1997 and 2018? (v.1, v.N, and v.2)

Conceptual Underpinning

Three conceptual underpinnings will support Weick's (1978/1983) loosely coupled systems' organizational theory. The first pillar gives an overview of American higher education post World War II. The second pillar will focus on metrics used to evaluate higher education effectiveness. The third pillar addresses performance funding policy differences and similarities in the United States. Weick's (1978/1983) loosely coupled systems' theory, provides an explanation of power relationships and decision making for policy stakeholders. Weick's theory is particularly applicable to the Missouri four-year public higher education governance and financial structures.

Loosely coupled systems

The overarching framework will be introduced to analyze the performance funding policy. The framework to do so is "loosely coupled" systems by Weick (1978/1983, p. 18). This framework introduces the setting in which schools are often managed differently from other organizations, with individual parts within the education setting being loosely coupled. Weick (1978/1983) describes how some aspects of an educational organization are more coupled compared to others. These varying degrees of coupling place organizations on a continuum of collaboration, which will be analyzed in the organizational analysis of this dissertation in practice.

American Higher Education

The first conceptual underpinning explores the G.I. Bill post World War II to indicate how education changed from being a privilege to being available to all. Also, through the baby boomer phenomena, which resulted in a population growth within the United States of America, the researcher hopes to explore the increased growth within the

United States of college-going students. Through history and the role of stats in higher education, the researcher hopes to explorer the move from college education availability to the few, to college education available to a significantly larger section of American society.

Next, the information will be funneled down to the State of Missouri and the history of higher education in the State. The researcher will explore information on the Missouri Department of Higher Education and Workforce Development, Coordinating Board of Higher Education, and Council on Public Higher Education. The section concludes with a brief the history of performance funding, starting with the 1993 model (v.1), the collapse of the model in 2002 (v.N), and the reintroduction of performance funding in 2014 (v.2). An exploration of the current landscape follows.

Effectiveness and Metrics

The second conceptual underpinning examines the history of effectiveness and the use of metrics within higher education. Specifically, the significance of retention and graduation rates will be address. Other than these two metrics, an overall overview will be given, including the history of and data that is collected by the National Center for Education Statistics (NCES) through the Integrated Postsecondary Education Data System (IPEDS).

Additionally, an efficiency piece will be introduced, which will also address the political drive to limit and save resources. This introduction will then role into the institutional effectiveness movement. A brief overview will also show how the effectiveness movement uses data not meant for these purposes. Moreover, the current state of higher education accountability, nationally and in Missouri, will be addressed.

Performance Funding Policy

In the third conceptual underpinning, the researcher will introduce and provide context for the history of the national higher education accountability movement. Efficiency policies will also be highlighted, including outside of higher education. Addressing an overview of the politics behind performance funding from both sides. The role of major foundations and other organizations will also be investigated, including the Lumina Foundation and the Bill and Melinda Gates Foundation. This pillar will funnel down into the specific higher education performance funding model that Missouri developed in 2014. The interplay between higher education stakeholders with different agendas and divergent approaches to key outcomes for higher education exemplify "loosely coupled" systems.

Design of the Study

Setting

This research study and the dissertation in practice will use a quantitative analysis. It will focus on analyzing the performance funding policy through the postpositivist worldview. According to Creswell (2014), this worldview is also referred to as the scientific method and focuses on trying to establish links, through quantitative research, between measurable outcomes. Data analyzing the impact of the performance funding police will come from existing data sets that are publicly available through the Missouri Department of Higher Education and the Integrated Postsecondary Education Data System. The researcher will collect publicly available, pre-existing quantitatively oriented data on retention and graduation rates from all four-year public institutions in the State of Missouri, the nine individual institutions, and the University Missouri system.

The policy of Performance Funding considers the University of Missouri System as one entity (even though four distinct location and campuses make up the system), so the researcher will use data from each the four individual institutions comprising the University of Missouri System. Table 3 illustrates how the four individual institutions are part of the larger University of Missouri system.

Participants

The performance funding policy in this study is important to thirteen four-year institutions; it also has several different entities, including Missouri Department of Higher Education and Workforce Development, the Coordinating Board of Higher Education, and the Missouri Department of Elementary and Secondary Education, which have considerable impact and influence on higher education policy in Missouri. More specifically, the researcher will provide background on each four-year public impacted by the policy.

The impacted institutions are Harris-Stowe State University, Lincoln University, Missouri Southern State University, Missouri State University, Missouri Western State University, Northwest Missouri State University, Southeast Missouri State University, Truman State University, University of Central Missouri, and the University of Missouri System. The University of Missouri System consists of four separate institutions which in the performance funding model are treated as a single entity; these are the University of Missouri – Columbia, the University of Missouri – Kansas City, the University of Missouri – St. Louis, and the University of Missouri of Science and Technology. Besides the institutions, the researcher will provide a background on the Missouri Department of Higher Education and Workforce Development, the Coordinating Board of Higher

Education, the Missouri Legislature, and the Council on Public Higher Education in Missouri.

Data from all four-year public institutions in the state of Missouri will be utilized in this study, the entire population is being analyzed. A population, according to Field (2017) consists of all of those who meet specific criteria, whereas a sample consists of a select number of the population. Field (2017) also highlights that a sample size of at least 30 is often considered the bare minimum for an accurate study. This study does not meet that criterion. Research by Thygesen and Ersbøll (2014) indicates that a benefit to having the entire population represented is the elimination of selection bias, while limitations include missing information and possible issues with data quality. Walter, Eliasziw, and Donner (1998) propose that the reliability of a small sample study can be improved by having multiple observations. In this study, the multiple observations will be from multiple years of retention and graduation rate data, observing the performance of the 10 institutions multiple times, measuring the impact of performance funding between 1997 and 2018 for graduation rates and 2003 through 2018 for retention rates.

Data Collection

As mentioned earlier, the researcher will use existing datasets that are publicly available through the Missouri Department of Higher Education and Workforce Development and the Integrated Postsecondary Education Data System in this study. More specifically, the researcher will collect retention and graduation rates for the nine individual institutions and the University of Missouri System, comprised of four distinct campuses. The Integrated Postsecondary Education Data System defines retention as those students who are first-time, full-time freshmen who returned for the second fall

semester (Integrated Postsecondary Education Data System, 2018). It also defines the graduation rate as those same first-time, full-time freshmen who completed their program within 150% of the allowed length of the program (Integrated Postsecondary Education Data System, 2018). The dataset will contain graduation rate data from between 1997 and 2018 and retention rate data between 2003 and 2018 for each of the institutions.

The researcher will submit the proposal for Institutional Review Board (IRB) feedback and approval if needed. As with any research study conducted, ethics of the study must be considered (Merriam & Tisdell, 2015). For this purpose, any study should submit to IRB. The purpose of IRB is to ensure protection against human rights violations. It is the responsibility of the research to address any risk to participants, whether physical, psychological social, economic, or legal (Creswell, 2014). This study utilizes secondary use of publicly available data, the researcher will request an IRB exemption with the University of Missouri's IRB, which is the host institution of this dissertation in practice. IRB approval from individual institutions is not required due to the data being publicly available from a secondary source (Creswell, 2014).

Data Analysis

The researcher will classify data collected into groups, v.1 for the first performance funding model, v.N for the period with no performance funding model in place, and v.2 for the second performance funding model.

Table 5

Performance Funding Models and Time Frames

Model	Time Frame	Data
v.1	1993 through 2002.	Retention: NA Graduation: 1997-2002

v.N	2003 through 2013.	Retention: 2003-2013 Graduation: 2003-2013
v.2	Implemented since 2014.	Retention: 2014-2018 Graduation: 2014-2018

Starting with a Bartlett's test, the researcher will try and determine homogeneity of multi-variances among the different sample sizes. According to Field (2017), this test should be run to determine whether the variances between several groups are equal. Field (2017) goes on to indicate that a one-way ANOVA assumes that the variances are equal across samples. Through both an ANOVA and ANCOVA, the data will be analyzed to see if the group differences are significant. The null hypotheses are 1) there is no impact on retention rates at four-year Missouri public institutions from in-place performance funding policy, and 2) there is no impact on graduation rates at Missouri four-year public institutions from performance funding policy. According to Field (2017), ANOVA identifies whether a difference in the mean between groups is statistically significant and likely not due to random variance or chance, but related to factors within the study variables.

The researcher is also considering an ANCOVA test for this study. According to Field (2017), an ANCOVA can control for a multivariate variable. These are variables that need to be controlled to test the null hypothesis (Field, 2017). Multivariate variables available in this study are 1) institutional selectivity, 2) the year associated with the rate, and 3) the size of the incoming cohort. Pell eligibility can be used as an indicator to determine students coming from low-income families (Heller, 2004). Unfortunately, during the time periods used, PELL data is not readily available publicly. However, Missouri public universities have considerable variance in admittance levels for Pell-

eligible students through their selectivity criteria. Controlling for economic variance among students can negate some of the income-related variance in populations of students in Missouri public universities. All three of these variables are available through the Postsecondary Education Data System as well as through the Missouri Department of Higher Education and Workforce Development.

Significance of the Study

Although others have researched performance funding policy, no study has yet been conducted to see the impact on retention and graduation rates at four-year Missouri public institutions. This research will allow future policymakers to be able to compare the various funding model used in Missouri, the second performance funding model that started in 2014 (v.2), the non-performance funding model that was used between 2002 and 2014 (v.N), or the 1993 performance funding model (v.1). Conducting this study may provide additional knowledge to other researchers interested in state policy, performance funding effectiveness, impact of differences in public universities' institutional resources, and governance structures. Also, policy analysts and policymakers will have another source of data available to determine the impact of various funding models for four-year public state institutions of higher education.

From the lens of the researcher's practice, conducting this study will allow the researcher to better advocate to policymakers and funding stakeholders and explain the impact of Missouri's public university funding models. The Missouri Legislature, individual institutions of higher education in Missouri, and the Missouri Department of Higher Education and Workforce Development have all been critical of the performance funding model in place. Conducting this research, will gain additional insights into the

impact of performance funding on retention and graduation rates. Through the retention and graduation rates the impact of the funding model on degree attainment in Missouri can be shared with the various stakeholders and more importantly, the researcher's institution will be able to be more informed on the impact of performance funding to better advocate for a funding formula or methodology that assists with increasing degree attainment and retention.

Since each performance funding model is slightly different, it is vital to add to the literature base. Conducting an additional study that looks at a specific performance funding model and its impact on retention and graduation rates in Missouri is important. As mentioned earlier, this study utilizes the entire population. However, this population is still considered small for statistical analysis using methods such as ANOVA and ANCOVA. Adding to the body of work will potentially allow other researchers to conduct a meta-study of performance funding models through the various individual studies conducted.

Summary

Higher education is now available to the masses, a national push for effectiveness and accountability is happening, and performance funding policies are becoming more prevalent (Loss & McGuinn, 2016). It is essential to reflect and see if these policies make a difference in setting up students for success. Performance funding has a long history in the State of Missouri dating back to its inception in 1993. Over the years the model has changed, measures are to be reviewed every three years, plus changes are made when a new commissioner of higher education is appointed or when a new governor is elected. It is time to see if the policy has an impact on both retention rates and graduation rates at

four-year public institutions in Missouri. Using Weick's (1978/1983) loosely coupled systems, the research will analyze the impact of performance funding.

This study will utilize a post-positivist worldview and quantitative analysis of existing data sets available through the Missouri Department of Higher Education and the Integrated Postsecondary Education Data System. Post-positivism is a worldview focused on both quantitative and qualitative analysis while acknowledging the bias of researchers (Creswell, 2014). Following ethical guidelines, an exemption will be requested from the University of Missouri's Institutional Review Board. The researcher will collect data from 2003 through 2018 for retention and graduation data from 1997 through 2018 for all four-year public state institutions in Missouri. To test the null hypothesis, the research will use an ANOVA and ANCOVA. Multivariate variables available for this study include selectivity of the institution, the year related to the rate, and the size of the incoming cohort.

The purpose of this study is to close a gap in the existing research by analyzing the impact of performance funding on retention and graduation rates at Missouri four-year public institutions of higher education. Also, results from this study will better inform policymakers and analysts. It will also have an impact on the researcher's practice as it will better inform the researcher on the historical impact of performance funding policies in the State of Missouri through peer-reviewed data. Stakeholders and policymakers may find value in the study, as it will provide insight on the efficacy of existing policy with the potential to inform future policy for performance funding related to shared values and desired outcomes like retention and graduation.

SECTION TWO – PRACTITIONER SETTING FOR STUDY

Higher education, and public higher education, in the United States of America has a long and rich history, one that many have written about (Loss & McGuinn, 2016; Lucas, 1994; Thelin, 2011). Harvard University is considered by many to be the oldest university in the United States of America, however defining the oldest or first university in America is complicated (Brubacher, 2017). History shows that institutions such as Harvard University and Princeton University, among others, predate the founding of the United States of America (Lucas, 1994).

The earliest version of the Department of Education was established in 1867, however, according to Lykes (1975), this did not last long as the department turned into an office of education instead a year later. Through the Smith–Towner Bill in 1920, another attempt was made to create the department, but in this case as well, the department did not include a position on the president's cabinet, and it quickly became a minor bureau within the Department of the Interior (Schmiesing, 2006). The Bureau of Education was moved over to the Federal Security Agency in 1939 and was renamed to the Office of Education (Cuéllar, 2009). In 1953, the Office of Education was restructured into the Department of Health, Education, and Welfare, with this restructure the department acquired a position on the president's cabinet (Miles, 1974). The current version of the Department of Education was created in 1979, while president Carter was in office, and although President Reagan campaigned to eliminate the cabinet level department, he was not successful in doing so (Loss & McGuinn, 2016). The Missouri Department of Education and Workforce Development is the organization that will be reviewed.

History of the Organization

The State of Missouri's higher education system includes 13 institutions of higher education that focus on four-year degrees and above, and 14 institutions that focus on two-year degrees (Missouri Higher Education Institutions, n.d.). Some of the first institutions pre-date, including what is now known as the University of Missouri – Columbia, the civil war (Z. Mulligan, personal communication, February 24, 2020). After the Civil War, the State of Missouri started five teacher colleges, to be in Cape Girardeau, Kirksville, Maryville, Springfield, and Warrensburg (Phillips, 1911). The number of institutions of higher education gradually kept expanding, including the first junior colleges starting in the 1920s (Z. Mulligan, personal communication, February 24, 2020). The next major shift in Missouri higher education institutions occurred in the 1960s when the University of Missouri System was formed by combining the University of Missouri – Columbia, Missouri Science and Technology, University of Missouri – Kansas City, and the new created campus in St. Louis, now known as University of Missouri – St. Louis (Olson, 1993).

During the 1960s, a first attempt was made to investigate coordinating all the higher education intuitions in Missouri (Campbell, 1967). The first iteration of this, the Commission on Higher Education, formed in 1963 and consisted of 6 lay members, University of Missouri president, one other public university president, one junior college president, and one private college president (Z. Mulligan, personal communication, February 24, 202). Duties of the Commission on Higher Education included:

> Studying enrollment and population trends. Identifying higher education needs. Developing arrangements for specialization. Developing a coordinated plan for

> higher education. Making recommendations about proposals to establish new institutions, residence centers, or degree programs. Recommending development, consolidation, or elimination of programs, degree offerings, and physical facilities. Recommending formulas to be used in making budget requests. Biennial reports to the governor and general assembly (p. 18).

An advisory council was also formed, consisting of both required membership and optional members, including all members from each institution's governing board, presidents, and the Commissioner of Higher Education (Z. Mulligan, personal communication, February 24, 2020).

During the 1970s, the State of Missouri went through reform actions, reducing the number of departments reporting directly to the governor (Valentine, 2004). The restructure resulted in 10 departments, including the Missouri Department of Higher Education, to be overseen by a board ("little Hoover asks", 1971). In 1972, then republican candidate for governor, recommended to create a super board that would oversee all the higher education institutions in Missouri ("Bond proposes super", 1972). However, in 1973, then Governor Bond, in discussion with republican and democratic senators, formed the Coordinating Board of Higher Education (CBHE), which would leave local boards intact but gave greater control to the newly formed CBHE (Church, 1973). Duties of CBHE include:

> Coordination. Studying enrollment and population trends Identifying higher education needs. Developing arrangements for specialization Developing a coordinated plan for higher education. Making recommendations about proposals to establish new institutions, residence centers, or degree programs.

> Recommending development, consolidation, or elimination of programs, degree offerings, and physical facilities. Recommending formulas to be used in making budget requests. Biennial reports to the governor and general assembly.

With local boards remaining intact, the duties of CBHE focus more on implementing state-wide educational policies such as performance-based funding models (Z. Mulligan, personal communication, February 24, 2020).

According to the 2014 Missouri senate bill 492, public higher education institutions in the State of Missouri must adhere to the performance funding program administered through the Department of Higher Education and Workforce Development, however, the legislature has the option on whether the model is used for funding or not in any given year (Missouri Revised Statutes: Mo. Rev. Stat. § 163.191 (2014)). Based upon the outcome on the performance funding measures, new monies to the core budget of institutions are recommended by the Commissioner of Higher Education.

The State of Missouri utilizes a complex system of governance and administration to operate the higher education system. The governor's office gives direction and has veto power on budget items, the state legislature proposes a budget and creates laws, the coordinating board of higher education also makes budget recommendation, and local boards approve individual institution budgets. The Missouri Department of Higher Education and Workforce Development, as well as the administration and local institutions, enforce, administer, and operate the higher education system.

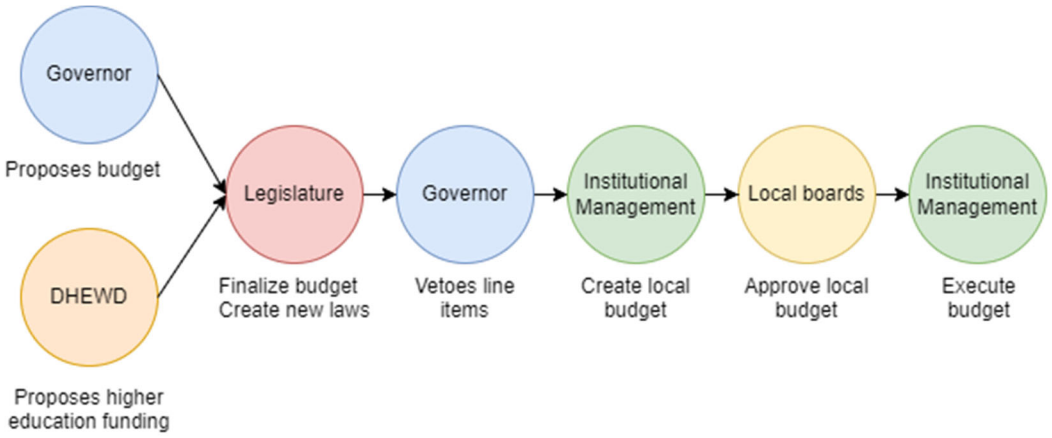


figure 1. Budget process flow in Missouri for higher education.

Organizational Analysis

To understand the operation and workings of complicated systems it is important to understand how an organization functions, even when the interactions are cross-organizational (Bolman and Deal, 2013). In the case of Missouri public university performance funding policy, many different entities can be considered, these include the Missouri house of representatives, the Missouri senate, the Governor of Missouri, the Coordinating Board of Higher Education, the Missouri Department of Higher Education and Workforce Development, and local public universities and colleges. In this section the influence on the performance funding policy will be looked at through two different lenses. First, through a structural lens, we review how different stakeholders interact and second, through a political lens, how resources are allotted. A structural lens, according to Bolman and Deal (2013), attempts to analyze an organization through its hierarchy, whereas the political lens attempts to explain the organizations and interactions from a power and influence perspective.

Structural Frame

The structural frame can also be interpreted as a scientific look at how an organization is structured and governed (Bolman and Deal, 2013). The groundwork for this lens comes from Taylor's (1916/2005) "The principles of scientific management", where in the researcher defines the structure, operations, and governance through a systemic scientific approach. To apply this structural lens to institutions of education, Weick (1978/1983) built upon the model and introduced the concept of loosely coupled systems. In the case of this study, loosely coupled system will be described as the groups influencing the political process of performance funding in Missouri. Each stakeholder has a modicum of decision power and impacts individual institutional outcomes. Mintzberg (1979/2005) has also contributed to the body of work describing parts of an organization through five basic parts, strategic apex, middle line, operating core, technostructure, and support staff.

As an example, in the early 2010s, work began on the current performance funding model. This model was officially voted upon through the Missouri legislature, but the details of the policy were developed through input from various stakeholders. Some of these stakeholders included the Missouri Department of Higher Education and Workforce development, the individual institutions, the Council on Public Higher Education in Missouri, the Governor's Office, the state Division of Budget and Planning, external consulting agencies, as well as the Coordinating Board of Higher Education (Performance Funding in Missouri, n.d.). Some of these entities, such as the Governor's Office, the Missouri Department of Higher Education and Workforce Development have an official hierarchical relationship within state governance in Missouri. Others, such as

the various individual institutions, operate within the same education space, but otherwise have their own governance with little to no impact on each other's governance. The individual institutions are on one end of the spectrum as truly loosely coupled systems, while the Governor's Office and the Missouri Department of Higher Education and Workforce Development are a coupled system. Understanding these structural relationships between the various entities is important to keep in mind while exploring performance funding policy.

Political Frame

Bolman and Deal (2013) describe the political frame as a lens through which organizations can be analyzed based on power, politics, and coalitions. Within this frame are concepts such as authorities, people or organizations with power, and partisans, it is people or organizations who can influence those who are considered authorities (Bolman and Deal, 2013). French and Raven (1959/2005) have contributed significantly to the body of work having identified five bases of power, coercive, reward, legitimate, referent, and expert. Pusser and Marginson (2012) have contributed to this body of work from the lens of higher education and more specifically, the impact global ranking instruments have on the relationship between politics and higher education. The concept of overbounded systems, where power is highly concentrated, and underbounded systems, where power is decentralized is also an important concept of the political frame (Bolman & Deal, 2013).

When it comes to developing performance funding policy, various stakeholders held various roles of power. Again, the Governor's Office has a legitimate power role with the Missouri Department of Higher Education and Workforce Development.

External consulting agencies however utilize their power differently, one that comes from knowledge and information, often referred to as expert power (Bolman & Deal, 2013). Individual institutions can team up to ensure that the measures selected are mutually beneficial, forming a coalition of power among loosely coupled institutions. The individual institutions operate within a underbounded system of power, and rely on mutual interest, while other portions of the more formal government structure leans towards an overbounded system, where the power is concentrated.

Implications for research in practitioner setting

This study will add to the knowledge of how various performance funding models work in higher education. By analyzing the model in Missouri, the researcher hopes to contribute to the body of work on this topic. This study will add to the knowledge of research from Burke and Modarresi (2000) who found that early indicators of the first performance funding model (v.1) showed effectives. Eventually a meta-analysis of all the various performance funding models could be conducted by other researchers. This type of research will help stakeholders such as legislators, governors, and educational professional better understand what implication a performance funding model may have on retention and graduation rates at four-year public institutions of higher education.

The G.I. Bill introduced post World War II, opened college to the masses, and an influx of monies became available to institutions (Bound & Turner, 2002; Mettler, 2002). This led to growth in the number of students as well as the number of institutions (Geiger, 2016). Now that those resources are becoming more scares, it is important to study how we fund our higher education model for the future. It is important to know how funding policies impact the outcomes for institutions and how the investments made

in students impact society. The accountability movement is not new to government, nor is it new to higher education, but the recent popularity and the emergence of new models of funding higher education require research to better inform those working in higher education.

Summary

Education in the United States and the governance of Higher Education has changed over the years. Various structures have been in place at both the federal level as well as within the State of Missouri. Performance funding policy as an organizational setting is broad and includes a variety of stakeholders. These include the individual institutions impacted by the policy, the Missouri legislature, the Coordinating Board of Higher Education, the Missouri Department of Higher Education and Workforce Development, the Governor's Office, as well lobby groups like the Council on Public Higher Education. To truly understand how each of these components interact it is important to look at the relationship between each stakeholder from both a structural lens as well as a political or power lens. Understanding how the components interact helps understand the efficacy of the policy.

SECTION THREE – SCHOLARLY REVIEW

The purpose of this section is to present a scholarly review related to the dissertation in practice. First, the researcher will provide a short overview of the problem in practice, followed by the purpose of the study. Last, the conceptual underpinnings, which consist of three pillars, will be presented. These research sections will be supported by an overall organizational theory that ties the analysis and interpretation together.

Problem in practice

While working in higher education in the State of Missouri at a four-year public university for 14 years, the researcher has noticed that the funding models keep shifting. Originally performance funding policies were not in place, later when they did come into play, the measures used would change based on who was in the Governor's Office. Since 2014, the state of Missouri has adopted a new version of performance funding policy (Performance Funding in Missouri, n.d.). Performance funding, through outcomes and efficiency measures, tries to fund universities by holding them accountable for their performance (Perna & Finney, 2014). The researcher works in Institutional Research and Effectiveness and provides feedback to organizations on how to best ensure funding through performance funding. Evaluating metrics is another common responsibility of institutional researchers (Saupe, 1990)

The state of Missouri, through the work of the Department of Higher Education and Workforce Development and with the approval of Coordinating Board of Higher Education, has a goal to increase degree attainment among its population (A Coordinated Plan for Higher Education in Missouri, n.d). This study will determine the impact of

performance funding policy on degree attainment in Missouri from 1993 to 2018. Metrics such as retention and graduation rates will be utilized to determine the level of impact and statistical significance of performance funding policy on vital metrics to evaluate public four-year universities' performance related to goals and outcomes for student success.

Purpose of the study

The purpose of this study is to examine the impact of performance funding policy in the State of Missouri on retention and graduation metrics. Since the State of Missouri has the policy to fund higher education institutions based upon their performance, and it has the policy to increase degree attainment, research should be conducted to see if these policies together achieve the goals of the State. Although only one of the six measures in the performance funding model directly focuses on degree attainment, measure one from table 1, all six measures will be used to analyze the effects of performance funding as each measure has an influence on the dollars an institution receives.

While research from Burke and Modarresi (2000) showed that an early 1990s model utilized in Missouri had succeeded in increasing performance, we still know very little about the 2014 (v.2) adopted performance funding model in the state of Missouri nor the long-term graduation rate impacts of the earlier model from 1993 (v.1). Research has shown that some performance funding models seem to show results while others do not (Hazelkorn, 2015; Rutherford & Rabovsky, 2014; Umbricht, Fernandez, & Ortagus, 2017). As addressed by Hillman, Tandberg, and Gross (2014), this is due to the realization that performance funding models are often politically driven and hard to compare as each model tries to achieve different outcomes. Therefore, a gap of

knowledge exists that addresses how the various funding models in Missouri impacts metrics such as student retention and graduation rates. To do this study, it is important to understand the higher education system in the United States of America and how it has evolved over time.

Conceptual Underpinnings

Post-World War II Higher Education

Higher education in the United States of America underwent a significant transformation post World War II (WWII) as the industry shifted from education for the privileged and few and moved towards an education model for the masses (Bound & Turner, 2002; Mettler, 2002; Geiger, 2016). The G.I. Bill, introduced post-war, was intended to offer both housing benefits as well as a path to a reduced cost college degree (Elder, 1987). According to Bledstein (1976), the impact of the changes in higher education post-WWII and a new culture of professionalism led to an increase in what is now known as the middle class. Bound and Turner (2002), argue that the impact of the G.I. Bill lead to an increase in degree attainment among veterans; however, their study had a hard time separating the effects of World War II in comparison with the impact of the Korean War. Others have argued that though the G.I. bill did bring many veterans to American colleges and universities, many of them did not complete college (Lazerson, 1998).

In the 1960s, universities kept growing, in part due to government funded research grants; at the same time, universities turned into large bureaucratic organizations (Heller, 2016). Although the 1950s had come with an economic boom, by the mid-to-late 1960s, it had reached its peak, resulting in unrest among college students (Fraser, 1988).

Many students were unhappy about the direction the country was heading, and protests organized by college students were frequent (Heller, 2016). During this time, the government also got more involved in higher education policy with the passing of the Higher Education Act of 1965 (Henry, 1975).

During the 1970s and the 1980s college enrollment was once again increasing, and the number of institutions of higher education also increased during this period (Lucas, 1994). During the time in the 1970s, rising costs were forcing institutions towards support from philanthropy, drastically increasing monies received from private giving (Henderson, 1974). It was also during this time that higher education started to feel the influence of politics and a push to begin measuring performance and focus on outcomes (Lucas, 1994).

The enrollment growth of the 1960s was also felt in Missouri, where the general assembly created a new University of Missouri System (Olson, 1993). Higher Education in Missouri has a long history; the state currently funds 13 public four-year institutions and 20 two-year colleges. The first institution founded in 1839 in Columbia, MO, is now part of the larger University of Missouri System, which was founded in 1963 when the University of Missouri combined with the Missouri University of Science and Technology, the formerly private University of Kansas City, and a brand-new campus in St. Louis (Olson, 1993). Table 6 lists when each institution in Missouri was founded in chronological order.

Table 6

Four-Year Public Institutions in Missouri and When They Were Founded.

Institution	Founded

University of Missouri-Columbia	1839
Harris-Stowe State University	1857
Lincoln University	1866
Truman State University	1867
Missouri University of Science and Technology	1870
University of Central Missouri	1871
Southeast Missouri State University	1873
Missouri State University	1905
Northwest Missouri State University	1905
Missouri Western State University	1915
University of Missouri-Kansas City	1929
Missouri Southern State University	1937
University of Missouri-St. Louis	1963

In 2014 enrollment in Missouri at four-year public universities was 153,346 students, which translates to a full-time equivalency (FTE) of 119,925 (MDHE Statistical Summary, 2018). FTE is a standardization method that accounts for all student credit hours generated and divides those credit hours by what is considered a full-time load [Integrated Postsecondary Education Data System, 2018). In 1981 the FTE in Missouri at all four-year public universities was 94,157, which means that in the past three decades, Missouri has seen an increase in FTE of 27 percent (MDHE Statistical Summary, 2018).

Effectiveness and Metrics

With more students attending college, an ever-increasing rise of cost, and many states defunding higher education, there is now a push for universities to be more productive and measure outcomes. The Integrated Postsecondary Education Data System (IPEDS) consists of annual surveys collected by the National Center of Educational Statics (NCES), participation is required for all Title IV granting institutions in the United States (About IPEDS, n.d.). The requirement stems from the adoption of the

Higher Education Act of 1965 (About IPEDS, n.d). Through this data collection, a standardized set of data for research purposes has become available (Ginder & Kelly-Reid, 2013). Table 7 identifies the various component surveys of IPEDS, each survey collects a variety of data related to the survey topic.

Table 7

IPEDS Surveys

Survey	Collection Cycle
Institutional Characteristics	Fall
Completions	Fall
12-month Enrollment	Fall
Student Financial Aid	Winter
Graduation Rates	Winter
Admissions	Winter
Outcome Measures	Winter
Fall Enrollment	Spring
Finance	Spring
Human Resources	Spring
Academic Libraries	Spring

With standard definitions, it is easier to do meaningful research (Field, 2017). IPEDS provides definitions for both retention rates and graduation rates. IPEDS methodology defines retention as first-time, full-time first-year students who retain from their first fall academic period to their second fall academic period (Integrated Postsecondary Education Data System, 2018). IPEDS methodology defines graduation rate as the percentage of first-time, full-time first-year students who complete an undergraduate degree within 150% of the length of the program (Integrated Postsecondary Education Data System, 2018).

Using these definitions, many have done research related to these metrics. To research retention, a combination of other data points, such as a student's first-generation status, socioeconomic status, academic preparedness, gender, and race or ethnicity are needed (DeBerard, Spielmans, & Julka, 2004). In 1975, Tinto introduced his model of college student retention, which theorized that students who are more socially integrated with their campus community are more likely to be retained, Tinto referred to this as the integration model (Tinto, 1975). In 1993, Tinto recognized three bases as to why student depart an institution, 1) academic difficulties, 2) a person's individual resolution to achieve goals, and 3) an inability to become part of, or remain part of, the institutions social and intellectual life (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006).

Similar studies exist for graduation rates. These studies are often combined with the same data points to look at different segments of first-year students to determine impacts on graduation rates (Scott, Bailey, & Kienzl, 2006). Alon and Tienda (2005) argue that the selectivity of an institution has an impact on graduation rates. Others have gone a step further, explaining that the IPEDS' right to know graduation rate is not the end all be all by which in institutions graduation rate should be measured (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006). Cook and Pullaro (2010) highlight the nuances behind graduation rates and caution it as a sole use for measuring an institution's effectiveness.

Besides the research on retention and graduation rates, a more significant movement started in the early 1990s through the 2000s in which colleges and universities wanted to be self-involved and determine what it means to be successful (Miller, 2008). This movement was in response to ranking surveys, such as U.S. News and World

Report, which had existed for decades, and although some institutions previously consulted on data that should be collected, many argued that the ranking formulas used favored the few (Altbach, 2006). Others, through analysis of multiple ranking tools, have argued that there are underlying systematic differences between ranking surveys, but the impact of these differences is speculative and requires further research (Stolz, Hendel, & Horn, 2010). With the introduction of ranking surveys, various legislatures around the country saw a new way of holding higher education accountable.

Accountability in Higher Education

To understand accountability in higher education, it is vital first to understand the meaning of accountability. Romzek (2000), defines accountability as a way or form in which one can provide answers to performance. What is now known as performance funding found its origin out of the Hoover Commission in the 1950s, which introduced performance budgeting for government agencies (Jordan & Hackbart, 1999). The Hoover Commission was formed to reorganize and shrink the number of departments within the federal branch of government post-World-War II budget constraints (Arnold, 1976). The modern version of performance funding in higher education came out of the New Accountability movement in early 1990. (Hillman, Tandberg, & Fryar, 2015). Although this new version of evaluating higher education based on performance gained popularity quickly in the political arena, by the early 2000s several states around the country gave up on the idea of funding higher education based upon performance metrics (Dougherty, Natow, Bork, Jones, & Vega, 2013). This abandonment of performance funding was in part due to a lack of both financial and political support, which was only short-lived in the 1990s (Dougherty et al., 2013). Eventually, in the mid-2000s, performance funding

regained momentum due to support from the Bill and Melinda Gates Foundation, Lumina Foundation, National Governors Association, Complete College America, and National Conference of State Legislatures (Hillman et al., 2015).

Performance funding in Missouri dates to 1993, when it was introduced as a new model to evaluate the performance of public universities and fund institutions according to performance metrics (Serban & Burke, 1998). The model introduced in Missouri lasted until 2002 and at its peak in 1999 only accounted for 1.6% of the total public funding the institutions received from the State (Dougherty, Natow, Bork, & Vega, 2010). Tennessee, in comparison, has had performance funding in place for higher education since 1979, and the contribution of public funds through performance funding accounts for 4.4% (Miao, 2012). South Carolina had one of the most aggressive funding formulas using performance funding with 38% of all funds coming from performance funding in 1999, this model however only lasted seven years (Dougherty et al., 2010).

Measurement in performance funding models varies greatly, but the intent is to provide a system in which institutions become more efficient and deliver on outcomes (Dougherty & Natow, 2015). The model introduced in Missouri in 1993 was named Funding for Results and included eight different measures for four-year public universities (Stein & Fajen, 1995). Funding for Results included the following measures 1) freshman success rates, 2) success of underrepresented groups, 3) performance of graduates, 4) successful transfer, 5) quality of new undergraduate students, 6) quality of new graduate students, 7) quality of prospective teachers, 8) and attainment of graduation goals (Stein, 2002; Naughton, 2004). However, by 2002 Funding by Results had lost momentum in the general assembly and new dollars were not being distributed to the

institutions using the formula which resulted in the abandonment of the model (Schmidt, 2002).

By 2011, the Missouri Department of Higher Education was directed to develop a new funding strategy for higher education institutions, which led to the Commissioner of Higher Education forming a taskforce to develop a new performance funding policy. The new performance funding policy was established in 2012 and codified in state statues in 2014 by the general assembly (Missouri Department of Higher Education, 2016). The performance funding model adopted measures performance in five different categories, which institutions being able to select from varying metrics at the end of every three-year cycle. The categories are 1) student success and progress, 2) increasing degree attainment, 3) quality of student learning, 4) financial responsibility and efficiency, and 5) an institution specific measure approved by the Coordinating Board of Higher Education in Missouri (Missouri Department of Higher Education, 2016).

Later, after an audit of the performance funding model by the Missouri State Auditor's office, the model was revised as required by the state, and new metrics were adopted (Galloway, 2017). These changes include the elimination of menu options that allowed institutions to have different metrics and the introduction of a sixth measure, measuring the placement of students after graduation (Performance Funding in Missouri, n.d.). The current metrics are degree completion per FTE, quality of student learning, financial responsibility, salary increases in comparison to Missouri household income, net tuition and fee increases in comparison to Missouri household income, and placement (Performance Funding in Missouri, n.d.). However, policy analysis of individual performance funding models is needed to better understand the actual impact on

institutional outcomes (Lahr, Pheatt, Dougherty, Jones, Natow, & Reddy, 2014; Umbricht et al., 2017). These days the cost of college to a student has increased significant, yet the average cost to educate an individual has not changed as drastically, it is who pays that has for at least public institutions changed, as state appropriations keep getting reduced (Hillstrom, 2020). To understand how a performance funding model impacts the work of higher education, it is important to understand how the governance structure of higher education operates.

Loosely couple systems

The researcher is utilizing loosely coupled systems introduced by Weick (1978/1983) as an overarching organizational theory. The intent is to highlight how the different stakeholders in performance funding policies are governed differently. Weick (1978/1983) refers to these varying degrees of control between different aspects of the organization as coupling. In the case of this dissertation in practice, the organization is the public four-year higher education system in Missouri. The individual stakeholders operating within the organization can either be highly coupled or loosely coupled. Weick (1978/1983) defines (or states) a highly coupled system as parts of the organization in which rules are clearly stated, all stakeholders agree on the rules set, some sort of compliance review is in place, and a feedback system or program evaluation are used to improve upon the system. In contrast, Weick (1978/1983) describes loosely coupled systems, in which one or more of the four aspects of a tightly coupled system described above is missing.

Loosely coupled systems have an inherent tendency to be contradictory to scholars as it forces one to think simultaneously about rationality and indeterminacy

(Orton & Weick, 1990). Thompson (1969) defines rationality within an organizational model as reason or logic. Indeterminacy on the other hand is defined as the quality of being vague and poorly defined, those items which cannot be easily explained (Thompson, 1969). The strength of this model lies in the fact that it describes both how the organization is interdependent, referred to as coupled, and how the organization can include spontaneous change without consultation, referred to as loosely (Orton & Weick, 1990).

According to Creswell (2014), for any research study to be conducted, one first needs to have a clear definition of the problem. Field (2017) indicates that to do a proper statistical analysis, the researcher should be aware of the issues related to the investigation. Orton and Weick (1990) take that a step further and explain that effectiveness and excellence are often determined differently within a loosely couple system. Therefore, the researcher finds it important to analyze the organization using loosely couple systems, highlighting that effectiveness of the policy may be interpreted differently within the organization.

Summary

Before World War II, education was not readily available to the masses; this changed with the introduction of the G.I. Bill which allowed veterans to attend college, which many did. As more people attended college, questions came forward on whether outcomes were being achieved. The government in the United States of America got more involved, and through the passing of the Higher Education Act of 1965 introduced the Integrated Postsecondary Education Data System. The passing of the Higher Education Act allowed researchers and policymakers to have access to large sets of data

from higher education institutions. Standard definitions were developed for items such as retention and graduation rates, and these were utilized in research studies. With the introduction of ranking surveys and the accountability movement, institutions started getting involved in regulating performance evaluation themselves. However, in the 1990s, partly due to rising costs, several states began adopting performance funding policies.

Missouri adopted a policy in 1993 that was abandoned in 2002 (v.1) and later took a new model in 2014 (v.2) that is still currently in effect. The organizational theory that can give insights into performance funding in Missouri is Weick's (1978/1983) loosely coupled systems. The researcher, through the previously discussed three pillars and the organizational theory, has a desire to analyze the impact of performance funding policy on retention and graduation metrics from four-year public universities in the state of Missouri between 1993 and 2018 and help resolve a lack of information on this topic.

SECTION FOUR – CONTRIBUTION TO PRACTICE

Plan for Dissemination of Practitioner Contribution

National Association of College and University Business Officers Conference

July 16-19, 2022

Denver, CO.

Type of Document

Slide Show Presentation

Rationale for this Contribution Type

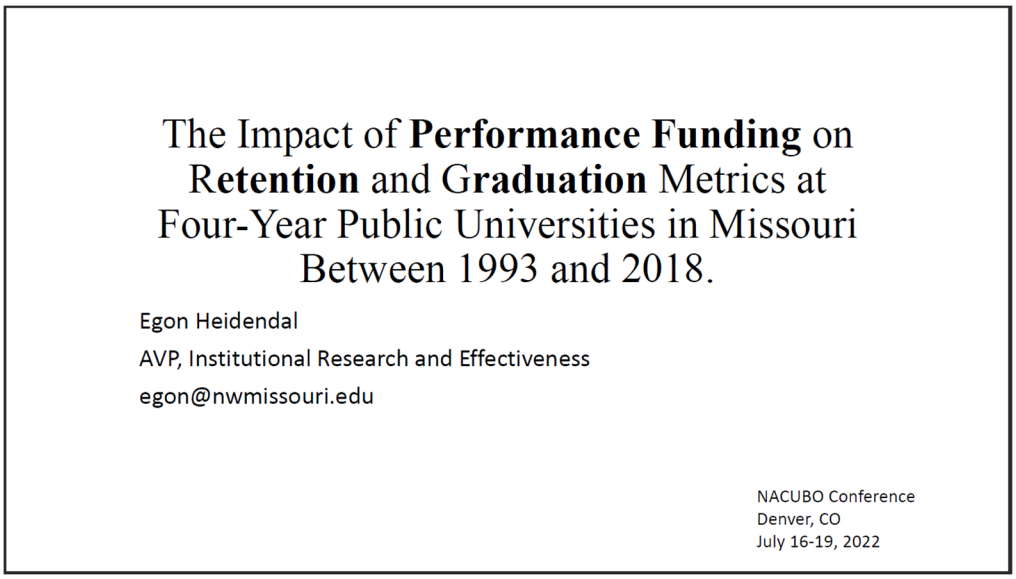
The slide show presentation is designed to assist stakeholders in making decisions based upon how proposed policy actions will likely affect the achievement of stated goals. The findings of this study will assist other business officers in determining what the probable effect of policy regarding the performance funding is on retention and graduation metrics. This information will also be useful in advocating at the state level regarding performance funding models for funding higher education.

Outline of Content

- Introduction
    - Purpose
    - Research questions
    - Organizational theory
- Methodology
    - Setting
    - Analysis
    - Timeframes

    - Models
- Findings
    - Research question 1
    - Research question 2
- Discussion
- References

Slide 1



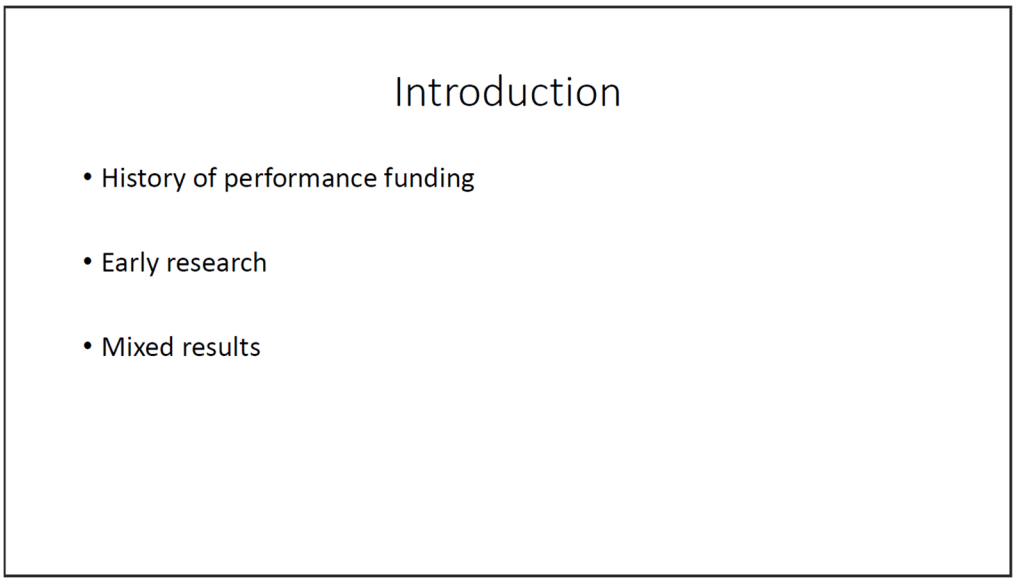
Introductions:

- Who I am
- Title
- Experience
- Educational background

Overview of the study

- The current performance funding model adopted in the State of Missouri has not been examined by other researchers to see if it has an impact on degree attainment in Missouri, which the State set a goal to increase to 60% by 2025 (A Coordinated Plan for Higher Education in Missouri, n.d.).
- Research from Hillman, Tandberg, and Gross (2014) suggest that in Pennsylvania, performance funding did not have a positive impact on degree completion.
- Also, research from Rutherford and Rabovsky (2014) shows that between 1993 and 2010, performance funding had "very little direct effect on student outcomes" (p. 205).
- Others, however, have shown that resource allocation based on the performance by an institution can have a short-term positive impact on student success (Liefner, 2003).

Slide 2

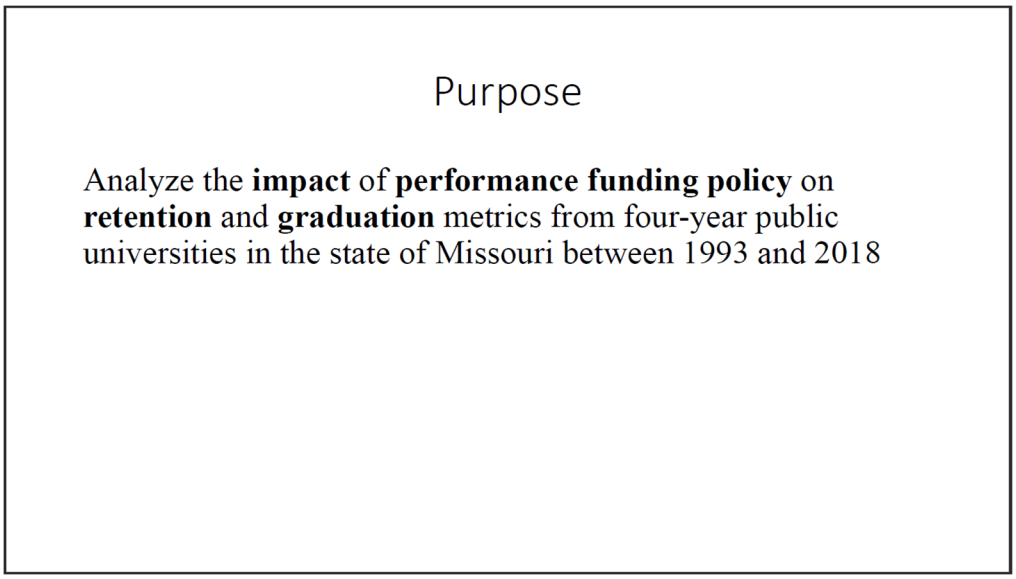


- Each model of performance funding is different. Some vary slightly, while others vary greatly, and thus it is crucial to study the model used in Missouri and its impact to inform the state, the institutions, and the public better whether funding policies align with degree attainment policies set in the State of Missouri.

- Research from Burke and Modarresi (2000) indicated that the early 1990s model utilized in Missouri had succeeded in increasing performance, limited knowledge exists about the more recently adopted performance funding model in the state of Missouri.

- Examining the literature between various performance funding models has shown that some performance funding models seem to show results while others do not (Hazlkorn, 2015; Rutherford & Rabovsky, 2014; Umbricht, Fernandez & Ortagus, 2017).

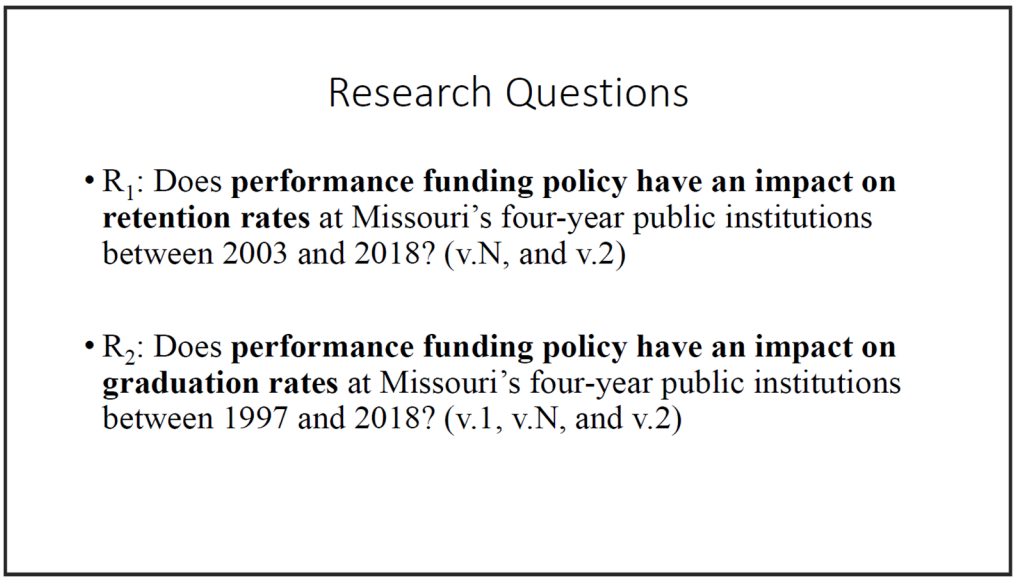
Slide 3



- The purpose of this study is to examine the impact of performance funding policy on retention and graduation rates from four-year public universities in the State of Missouri between 1993-2018.

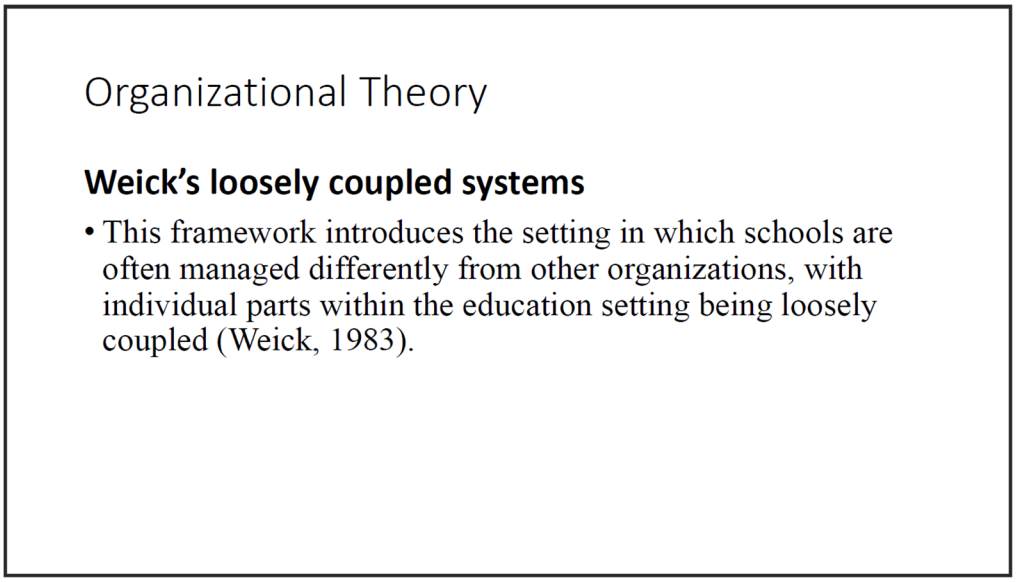
- The State of Missouri has both a policy to fund higher education institutions based upon their performance and a policy to increase degree attainment, therefore research should be conducted to see if these policies together achieve the goals of the State of Missouri.

Slide 4



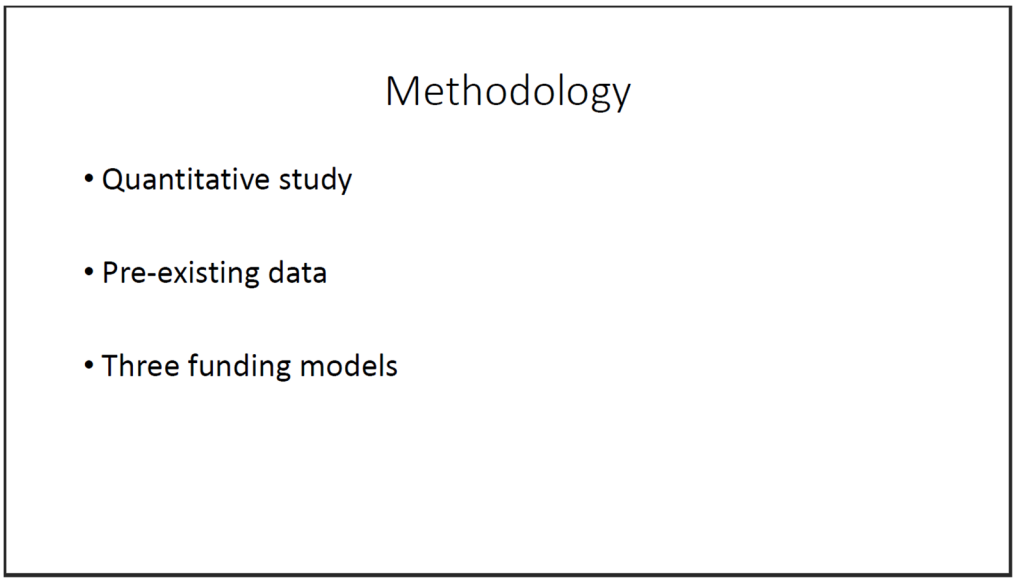
- Missouri has had performance funding in place twice, the first model of performance funding covered 1993 through 2022 and is referred to in this study as v.1.
- During the period between 2003 and 2013, there was not a performance funding model in place, this period is referred to as v.N.
- From 2014 on the State of Missouri has had a performance funding model in place again, referred to as v.2 in this study.
- Retention data is available for the time frame that covers v.N and v.2.
- Graduation rate data is available for the time frame that covers v.1, v.N, and v.2.
    - For v.1, the graduation rate starts in 1997, while the model started in 1993.

Slide 5



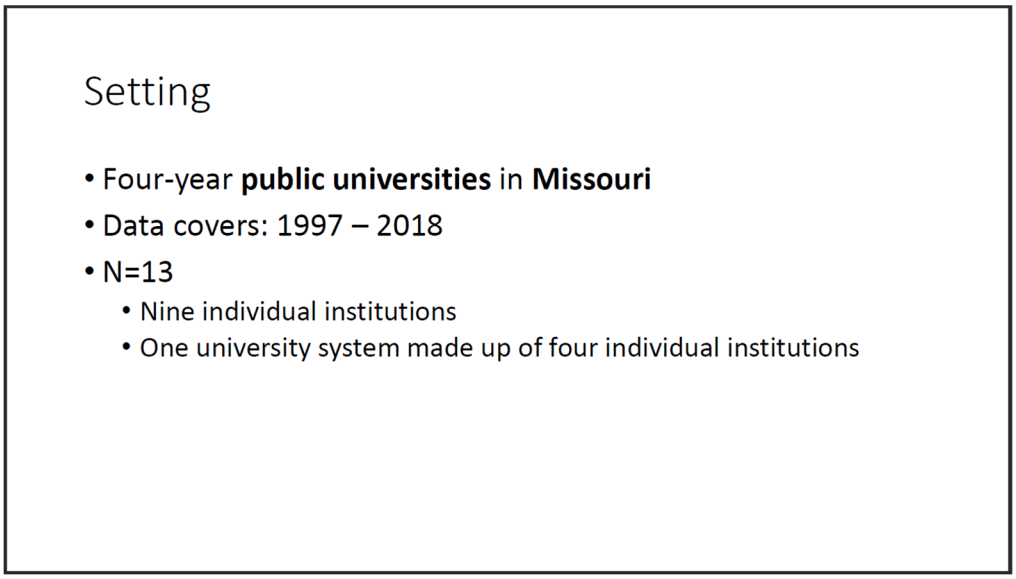
- The overarching theoretical framework utilized is loosely coupled systems introduced by Weick (1978/1983).
- The intent is to highlight how the different stakeholders in performance funding policies are governed differently.
- Weick (1978/1983) refers to these varying degrees of control between different aspects of the organization as coupling.
- The individual stakeholders operating within the organization can either be highly coupled or loosely coupled.
- Weick (1978/1983) defines (or states) a highly coupled system as parts of the organization in which rules are clearly stated, all stakeholders agree on the rules set, some sort of compliance review is in place, and a feedback system or program evaluation are used to improve upon the system.
- In contrast, Weick (1978/1983) describes loosely coupled systems, in which one or more of the four aspects of a tightly coupled system described above is missing.
    - The public 4-year higher education system in Missouri can be described as a loosely coupled system.

Slide 6

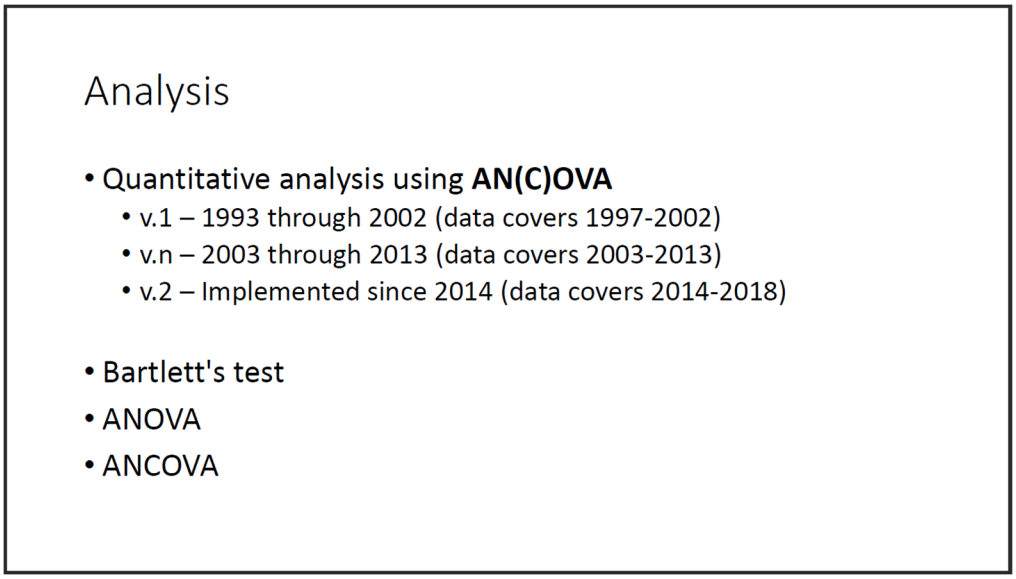


Next is a look at the setting, analysis, and timeframes used.

Slide 7

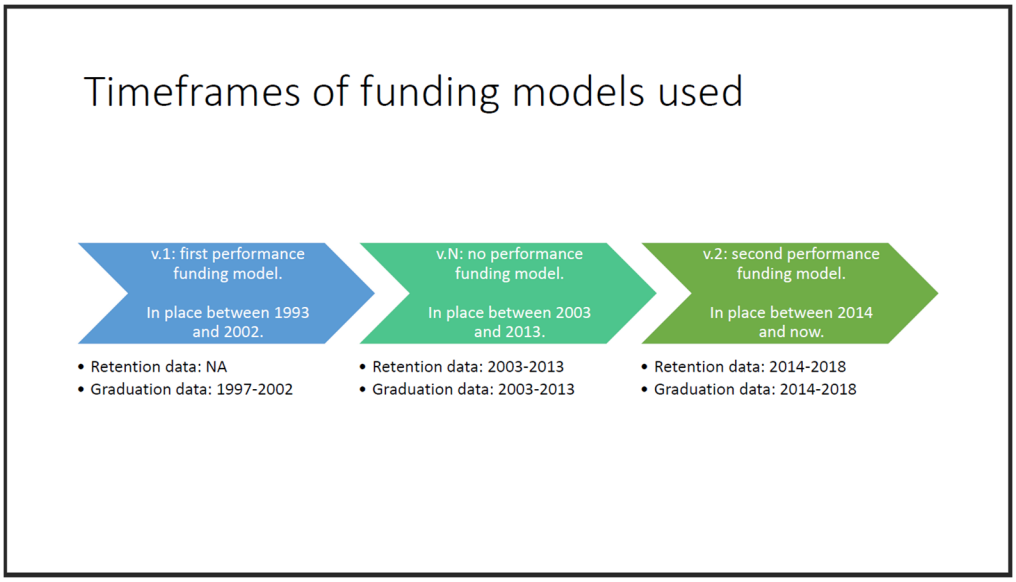

Setting
• Four-year **public universities** in **Missouri**
• Data covers: 1997 – 2018
• N=13
• Nine individual institutions
• One university system made up of four individual institutions

Slide 8



- Both Excel spreadsheets were loaded into SPSS and recoding was conducted to identify the models.
- Despite the retention data only having two groups for comparison, the researcher chose to use an ANOVA analysis to keep outputs and interpretation between research questions consistent.
- The graduation data does utilize three groups for comparison, the performance funding model used between 1993 and 2002 (v.1), the period where no performance funding model was utilized; 2003 through 2013 (v.N), and the second performance funding model used between 2014 and 2018 (v.2). For the retention analysis only v.N and v.2 data was available to the researcher.

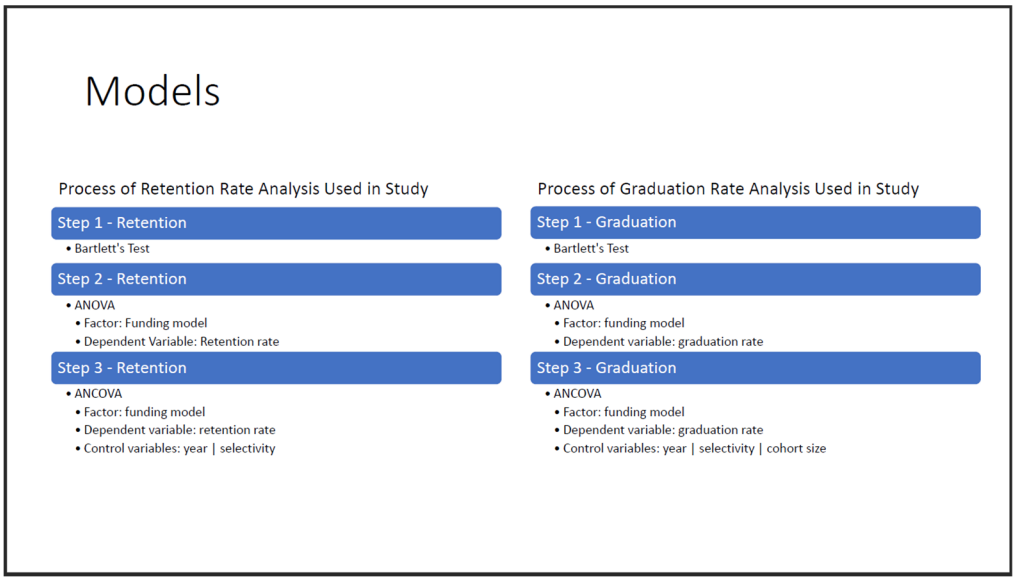
Slide 9



The study covers three separate models of funding:

- v.1 – the first performance funding model in Missouri was in effect from 1993 till 2002. Retention data is not available, graduation data covers 1997-2002.
- v.N – the period in which no performance funding model was used, 2003 – 2013. Retention and graduation data is available for the whole period.
- v.2 – the second performance funding model in Missouri has been in effect from 2014 on. Data for retention and graduation covers 2014 through 2018.

Slide 10



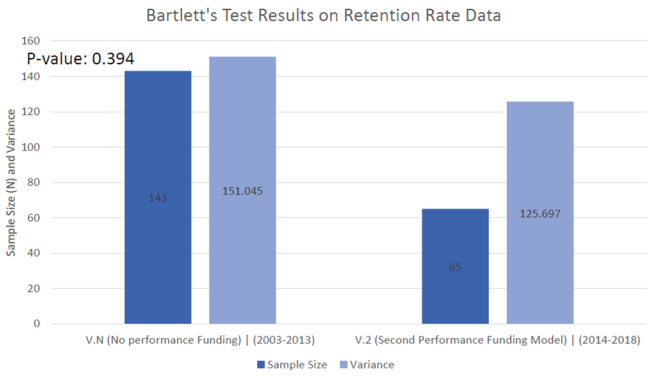
- For this study multiple models were built to answer both research questions.
- For retention, the researcher first ran Bartlett's Test, which measures the homogeneity of multi-variances. What this does is test to make sure all the groups are similar enough in nature to conduct the statistical analysis.
- According to Field (2017), this test should be run to determine whether the variances between several groups are equal. Field (2017) goes on to indicate that a one-way ANOVA assumes that the variances are equal across samples.
- This same test was run for the graduation rate data. Next the ANOVA model was designed as well as the ANCOVA model to account for control variables.

Slide 11

Findings

Slide 12

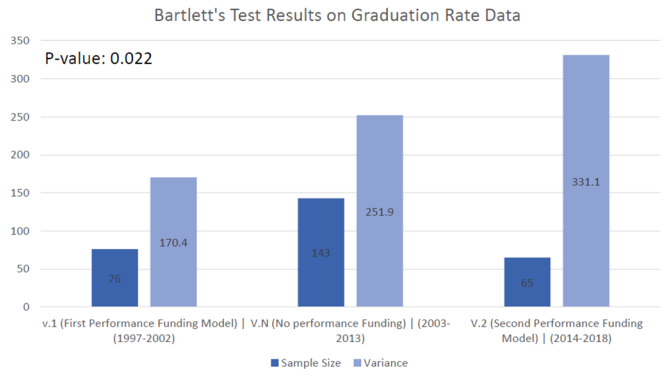
R_1: Does **performance funding policy have an impact on retention rates** at Missouri's four-year public institutions between 2003 and 2018? (v.N, and v.2)



- Bartlett's test was run to see if an ANOVA can be run between the two groups since there is not an equal number of data points between the two models. The Bartlett's test determined that the variance between the two groups was too great to produce a result using an ANOVA test that would be valid. The sample size (N) and the variance of each model are listed in on the y axis.
- This Bartlett's Test indicates that the null hypothesis on research question one remains.

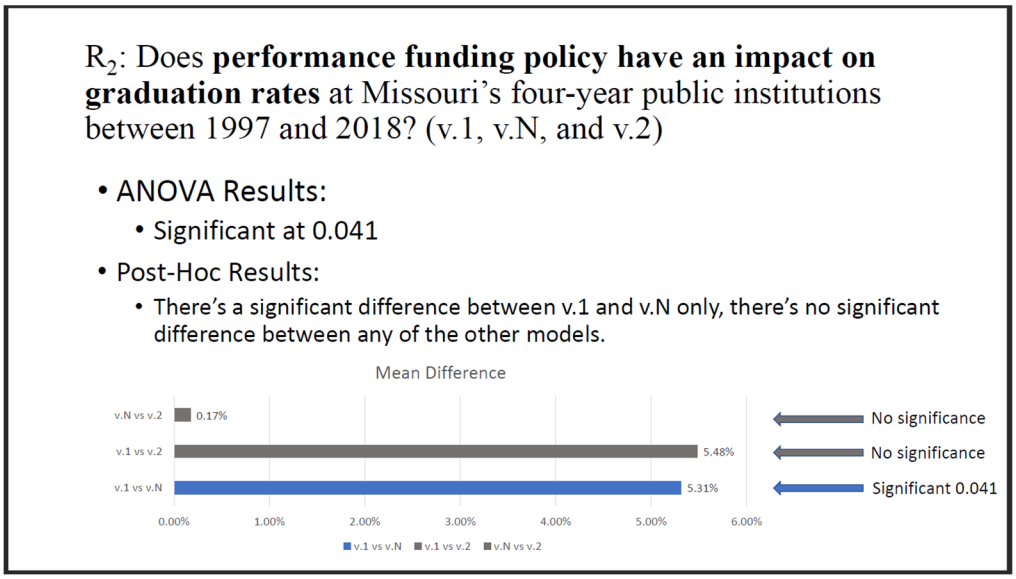
Slide 13

R_2: Does **performance funding policy have an impact on graduation rates** at Missouri's four-year public institutions between 1997 and 2018? (v.1, v.N, and v.2)



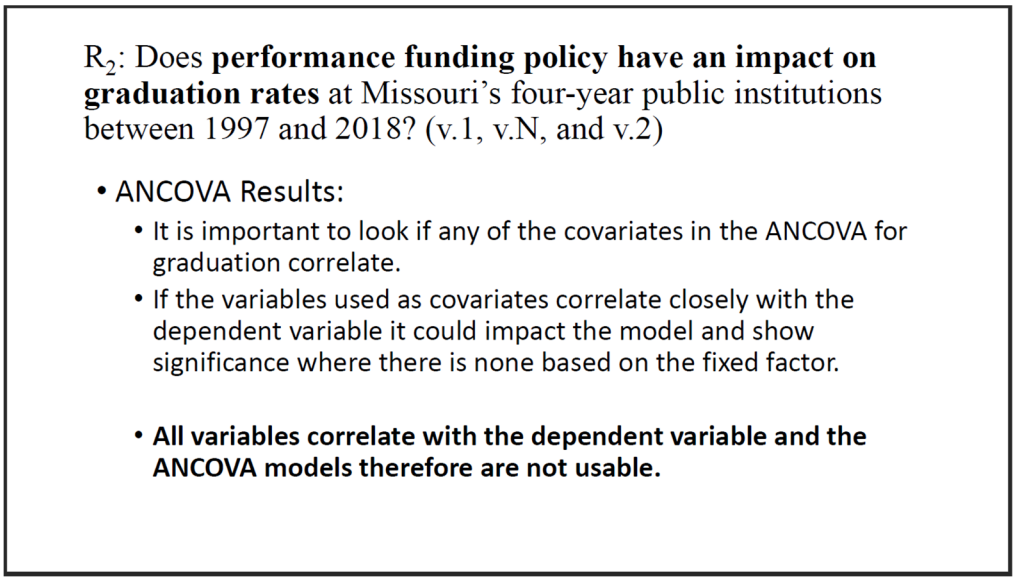
- This test concludes that there is homogeneity of variance among the three groups on graduation rates. The ANOVA and ANCOVA results can be run next. The sample size (N) and the variance of each model are listed in on the y axis.

Slide 14



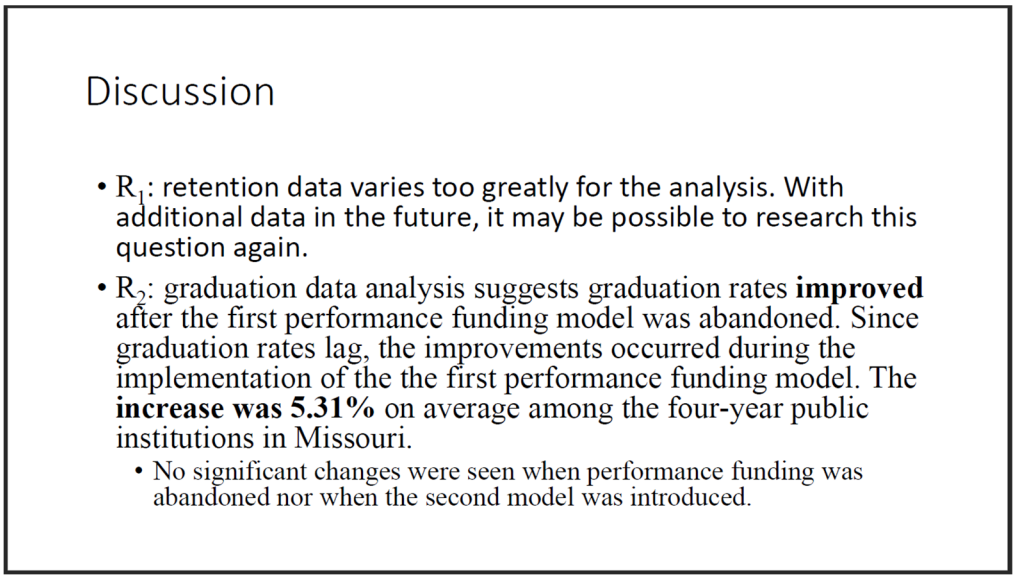
- The ANOVA shows significance at a value of 0.041, which is less than the significance value of 0.05 needed. This validates there is a significant difference between funding and the impact it has had on graduation rates.
- Next a Tukey post hoc analysis should show whether there is significance between all three funding models or not. Doing a Tukey post hoc analysis helps adjust for the experiment-wise error rate. The experiment-wise error rate corrects for the fact that the more groups you have the more likely significance will occur, it calculates an adjusted significance value between each combination of groups (Field, 2017).
- The results of the Tukey post hoc analysis show that there is only a significant difference between the first performance funding model v.1 and the period in which no performance funding model was in place v.N. The difference in graduation rate between the two models is an increase of 5.3111% from v.1 to v.N.
- This concludes there is a significant difference between the first performance funding model and the after the first performance funding model, when no performance funding model was in place.
- There was no significant impact from the second performance funding model that was started in 2014.

Slide 15



- Before discussing results, it is important to look if any of the covariates in the ANCOVA for graduation correlate. If the variables used as covariates correlate closely with the dependent variable it could impact the model and show significance where there is none based on the fixed factor.
- All correlation runs indicate that the ANCOVA model is heavily correlated and should be dropped from the analysis.

Slide 16



- It is important to note that there was a 5.31% average increase in graduation rates among four-year public universities in Missouri after the introduction of performance funding. The lagging nature of the data may have led to a delayed acknowledgement of the results of the policy. This aligns with previous research from Burke and Modarresi (2000) who had seen early indicators of success in the first performance funding model (v.1). It would have been too early to look at graduation rate impacts at that time.
- The researcher sees opportunity for additional research to be conducted in the future. The size of the sample can certainly be the issue here and reproducing this study with additional future data once it becomes available is a recommended.
- The researcher recommends that any future model should strike a balance between short-term, mid-term, and long-term metrics. A metric that looks at how many students drop-out of college each term would provide more actional data for institutions of higher education to address in the short-term. Retention rates may be a mid-term metrics, taking a couple of years to see the impact from changes, and graduation rates could be used as long-term metric, taking seven to eight years to see results from actions taken.

Slide 17

References

A Coordinated Plan for Higher Education in Missouri, (n.d.). Retrieved from https://dhe.mo.gov/blueprint.php

Burke, J. C., & Modarresi, S. (2000). To keep or not to keep performance funding: Signals from stakeholders. The Journal of Higher Education, 71(4), 432-453.

Field, A. (2017). Discovering statistics using IBM SPSS Statistics (5th ed.). Thousand Oaks, CA: Sage.

Hazelkorn, E. (2015). Rankings and the reshaping of higher education: The battle for world-class excellence. New York: Springer.

Hillman, N. W., Tandberg, D. A., & Gross, J. P. (2014). Performance funding in higher education: Do financial incentives impact college completions? The Journal of Higher Education, 85(6), 826-857.

Liefner, I. (2003). Funding, resource allocation, and performance in higher education systems. Higher Education, 46(4), 469-489.

Rutherford, A., & Rabovsky, T. (2014). Evaluating impacts of performance funding policies on student outcomes in higher education. The Annals of the American Academy of Political and Social Science, 655(1), 185-208.

Umbricht, M. R., Fernandez, F., & Ortagus, J. C. (2017). An examination of the (un) intended consequences of performance funding in higher education. Educational Policy, 31(5), 643-673.

Weick, K. (1983). Educational organizations as loosely coupled systems. In J. Baldridge & T. Deal (Eds.), *The dynamics of organizational change in education* (pp. 15-37). Berkeley, CA: McCutchan Publishing Corporation. (Reprinted from *Administrative Science Quarterly, 23,* pp. 541-552, 1978)

SECTION FIVE – CONTRIBUTION TO SCHOLARSHIP

Target Journal

The Journal for Higher Education

Rationale for this Target

The Journal for Higher Education looks at higher education and publishes original research related to the broad enterprise that is higher education. Established in 1930, it has published different research and articles on performance funding policies in the past.

Outline of Content

Basic Elements

- Separate Title Page
- Abstract
- Introduction
- Literature Review
- Data, Methods, and Findings
- Discussion of Results and Future Work

Formatting

- PDF Document
- 1” Margins, Double Spaced
- APA style guideline for formatting
- Parenthetical Citations

Plan for Submission

Who: The Journal for Higher Education

When: Summer 2022

How: Submit electronically to https://www.tandfonline.com/journals/uhej20

Manuscript

Title

The impact of performance funding on retention and graduating metrics at four-year public universities in Missouri between 1993 and 2018.

Abstract

Performance funding has been a popular form of funding colleges and universities for several decades. Often the purpose is to make universities more efficient (Miao, 2012). Missouri has had two separate models of performance funding in play, a decade apart. In this research both performance funding models are examined, including a 10-year period when no performance funding model was in place, to see if there has been an impact on retention and graduation metrics at four-year public institutions in Missouri. The organization of higher education in Missouri is examined through Weick's (1978/1983) loosely coupled systems to better understand the components of the system. Using publicly available retention and graduation data from the 13 public universities, a quantitative analysis using an ANOVA is used to see if there is a significant difference in retention and graduation rates between the three funding models. A 5.3% increase in graduation rates between the first performance funding model and the period right after was found to be significant. The lagging nature could be the cause and the researcher recommends using a mixture of measures that are leading and lagging.

Keywords

Performance funding, finance, higher education, retention, graduation, Missouri.

Introduction

State legislatures have utilized performance funding in higher education for several decades (Liefner, 2003; Miao, 2012). Most performance funding models attempt to assess higher education institutions based on output measures such as retention, graduation, course completion, degree completion, and placement, instead of inputs such as enrollment (Dougherty, Natow, Bork, Jones, & Vega, 2013). According to Burke and Modarresi (2000), to truly understand a performance funding model, which often vary from one state to another, one needs to answer first the *what* and *how* performance is measured and for which purpose. Most performance funding models see influences from political movements within a state (Burke & Modarresi, 2000; Dougherty et al., 2013; Hillman, Tandberg, & Fryar, 2015). Umbricht, Fernandez, and Ortagus (2017) found for example that performance funding in Indiana did not lead to more graduates, but instead led to declining admission rates and increased admissions selectivity.

In Missouri, the first performance funding model was implemented by the Coordinating Board of Higher Education in 1993 and this model remained the primary funding formula until its demise in 2002 (v.1) (Dougherty et al., 2013). During the period between 2003 and 2013 (v.N), there was no official performance funding model in Missouri to find higher education. In 2014 a new performance funding model (v.2) was introduced in Missouri to once again fund institutions of higher education in Missouri based on differences in performance (Performance Funding in Missouri, n.d). Research from Burke and Modarresi (2000) indicated that the early 1990s model utilized in Missouri had succeeded in increasing performance, limited knowledge exists about the more recently adopted performance funding model in the state of Missouri.

The various models of performance funding vary across states and time period, but the intent is the same, to provide a system in which institutions become more efficient and deliver on outcomes (Dougherty & Natow, 2015). The 1993 model shown in Table 2, introduced by Missouri was named Funding for Results and included a set of eight different measures for universities (Stein & Fajen, 1995). Funding for Results included the following measures 1) freshman success rates, 2) success of underrepresented groups, 3) performance of graduates, 4) successful transfer, 5) quality of new undergraduate students, 6) quality of new graduate students, 7) quality of prospective teachers, 8) and attainment of graduation goals (Stein, 2002; Naughton, 2004). In 2002, momentum was lost in the general assembly for Funding by Results, at which time the decision was made to not allocate new dollars to the institutions using the formula. Because of a lack of political will and economic pressures, the model was abandoned in Missouri in 2002. (Schmidt, 2002).

By 2011, the Missouri Department of Higher Education was directed to develop a new funding strategy for higher education institutions, which led to the commissioner of higher education forming a taskforce to develop a new performance-based funding policy. The new performance-based funding policy was established in 2012 and codified in state statues in 2014 by the general assembly (Missouri Department of Higher Education, 2016). The performance funding model adopted measures performance in five different categories, listed in Table 1, which institutions being able to select from varying metrics at the end of every three-year cycle. The categories are 1) student success and progress, 2) increasing degree attainment, 3) quality of student learning, 4) financial responsibility and efficiency, and 5) an institution specific measure approved by the

Coordinating Board of Higher Education in Missouri (Missouri Department of Higher Education, 2016).

The state of Missouri, through the work of Department of Higher Education and Workforce Development and with the approval of Coordinating Board of Higher Education, has a goal to increase degree attainment among its population (A Coordinated Plan for Higher Education in Missouri, n.d). This study will determine the impact of performance funding policy on higher education degree attainment in Missouri from 1993 to 2018. To evaluate public four-year universities' performance related to goals and outcomes for student success, metrics such as retention and graduation rates will be utilized to determine the level of impact and statistical significance of performance funding policy on significant markers of higher education success.

Literature review

Higher education in the United States of America underwent a significant transformation post World War II (WWII) as the industry shifted from education for the privileged and few and moved towards an education model for the masses (Bound & Turner, 2002; Mettler, 2002; Geiger, 2016). The G.I. Bill, introduced post-WWII, was intended to offer both housing benefits as well as a path to a reduced cost college degree (Elder, 1987). According to Bledstein (1976), the impact of the changes in higher education post war and a new culture of professionalism led to an increase in what is now known as the middle class.

In the 1960s, universities kept growing, in part due to government-funded research grants; at the same time, universities turned into large bureaucratic organizations (Heller, 2016). Although the 1950s had come with an economic boom, by the mid-to-late

1960s, it had reached its peak, resulting in unrest among college students (Fraser, 1988). Many students were unhappy about the direction the country was heading, and protests organized by college students were frequent (Heller, 2016). During this time, the government also got more involved in higher education policy with the passing of the Higher Education Act of 1965 (Henry, 1975).

With more students attending college, an ever-increasing rise of cost, and many states defunding higher education, there is now a push for universities to be more productive and measure outcomes. The Integrated Postsecondary Education Data System (IPEDS) consists of annual surveys collected by the National Center of Educational Statics (NCES), participation is required for all Title IV granting institutions in the United States (About IPEDS, n.d.). Title IV is part of the Higher Education Act of 1965 and oversees the administration of financial assistance, such as federal student loans and PELL grants (Overview of Title IV, n.d.). The requirement stems from the adoption of the Higher Education Act of 1965 (About IPEDS, n.d.). Through this data collection, a standardized set of data for research purposes has become available (Ginder & Kelly-Reid, 2013).

Performance funding in Missouri dates to 1993 when it was introduced as a new model to evaluate the performance of public universities and fund institutions according to performance metrics (Serban & Burke, 1998). The model introduced in Missouri lasted until 2002 and at its peak in 1999 only accounted for 1.6% of the total public funding the institutions received from the State (Dougherty, Natow, Bork, & Vega, 2010). Tennessee, in comparison, has had performance funding in place for higher education since 1979, and the contribution of public funds through performance funding accounts for 4.4%

(Miao, 2012). South Carolina had one of the most aggressive funding formulas using performance funding with 38% of all funds coming from performance-based funding in 1999, this model however only lasted seven years (Dougherty et al., 2010).

The researcher is utilizing loosely coupled systems introduced by Weick (1978/1983) as an overarching organizational theory. The intent is to highlight how the different stakeholders in performance funding policies are governed differently. Weick (1978/1983) refers to these varying degrees of control between different aspects of the organization as coupling. In the case of this dissertation in practice, the organization is the public four-year higher education system in Missouri. The individual stakeholders operating within the organization can either be highly coupled or loosely coupled. Weick (1978/1983) defines (or states) a highly coupled system as parts of the organization in which rules are clearly stated, all stakeholders agree on the rules set, some sort of compliance review is in place, and a feedback system or program evaluation are used to improve upon the system. In contrast, Weick (1978/1983) describes loosely coupled systems, in which one or more of the four aspects of a tightly coupled system described above is missing.

Loosely coupled systems have an inherent tendency to be contradictory to scholars as it forces one to think simultaneously about rationality and indeterminacy (Orton and Weick, 1990). Thompson (1969) defines rationality within an organizational model as reason or logic. Indeterminacy on the other hand is defined as the quality of being vague and poorly defined, those items which cannot be easily explained (Thompson, 1969). The strength of this model lies in the fact that it describes both how the organization is interdependent, referred to as coupled, and how the organization can

include spontaneous change without consultation, referred to as loosely (Orton and Weick, 1990).

Data, methods, and findings

The researcher in this quantitative study examined if there is a significant difference between three versions of funding higher education in the State of Missouri using an ANOVA and ANCOVA. According to Field (2017), ANOVA identifies whether a difference in the mean between groups is statistically significant and likely not due to random variance or chance, but related to factors within the study variables. The dependent variables are retention rate and graduation rate. These two dependent variables are used two answer two different research questions, does performance funding policy have an impact on retention rates at Missouri's four-year public institutions between 2003 and 2018? (v.N, and v.2) and does performance funding policy have an impact on graduation rates at Missouri's four-year public institutions between 1997 and 2018? (v.1, v.N, and v.2). The factor variable is the model of funding in place at the time of the retention and graduation data. The three models of funding are described in Table 5. Data analysis was completed with IBM SPSS 9 (version 26).

Data collection. Retention rates were acquired for each four-year public university in Missouri from the National Center for Education Statistics (NCES). This center maintains publicly available data on all Title IV funded institutions of higher education in the United States of America, through the Integrated Postsecondary Education Data System (IPEDS). Retention rate is defined as those students who entered a postsecondary education institution as a first-time, full-time freshman, and were retained at the same institution the next year (Integrated Postsecondary Education Data System, 2018).

Graduation rates were also acquired as publicly available data from NCES through IPEDS data collections. Graduation rate is defined as those students who entered a postsecondary education institution as a first-time, full-time freshman, and completed an undergraduate award within 150% of the length of the program (Integrated Postsecondary Education Data System, 2018). For example, a bachelor's degree that requires four years to complete allows the student to be counted as graduated in the graduation rate if they complete that program within six years of entering the postsecondary institution. An associate degree that requires two years would allow for three years to complete to be counted in an institutions graduation rate.

Data Analysis. Both Excel spreadsheets were loaded into SPSS and recoding was conducted to identify the models. This was done through recoding the time variable, year, into a categorical variable indicating the funding model (v.1, v.N, and v.2). Despite the retention data only having two groups for comparison, the researcher chose to use an ANOVA analysis to keep outputs and interpretation between research questions consistent. The graduation data does utilize three groups for comparison, the performance funding model used between 1993 and 2002 (v.1), the period where no performance funding model was utilized; 2003 through 2013 (v.N), and the second performance funding model used between 2014 and 2018 (v.2). For the retention analysis only v.N and v.2 data was available to the researcher.

For this study multiple models were built to answer both research questions. For retention the researcher first ran Bartlett's Test, which measures the homogeneity of multi-variances. According to Field (2017), this test should be run to determine whether the variances between several groups are equal. Field (2017) indicates that a one-way ANOVA assumes equal variances across samples. This same test was run for the graduation rate data. Next the ANOVA model was designed as well as the ANCOVA model to account for control variables.

Findings. The purpose of this study is to see if the various funding models in Missouri have had an impact on degree attainment among Missouri residents. The State of Missouri has had various funding models in place to fund higher education and it is important to understand the impact of those on retention and graduation metrics. The State of Missouri, in 2015, set a goal of 60%-degree attainment among Missouri residents in its strategic plan, a blueprint for higher education in Missouri (A Coordinated Plan for Higher Education in Missouri, n.d.). In addition, previous research has shown that certain performance funding models are successful in attaining goals set out in the model, while others do not (Hazelkorn, 2015; Rutherford & Rabovsky, 2014; Umbricht, Fernandez, & Ortagus, 2017). This research study will add to the literature base by providing additional data on a model previously not researched.

Research question 1. The purpose of this question is to examine the impact performance funding policy may have had on retention at four-year public institutions in the State of Missouri. Such impact is important to know since retention rates are an early indicator for degree completion and student success. The funding model is being used to predict the impact on retention rates:

R_1: Does performance funding policy have an impact on retention rates at Missouri's four-year public institutions between 2003 and 2018? (v.N, and v.2)

To start a Bartlett's test was run to see if an ANOVA can be run between the two groups since there is not an equal number of data points between the two models. The Bartlett's test determined that the variance between the two groups was too great to produce a result using an ANOVA test that would be valid. The Bartlett's test results, shown in Table B7, indicate a variance of 151.145 with a sample size of 143 for v.N. It

also shows a variance of 125.697 with a sample size of 65 for v.2. The Chi-square value is 0.72518 and the P-value is above the threshold that would indicate significance (0.05) at 0.394, indicating no significance. This test concludes that there is no homogeneity of variance among the two groups and the results of an ANOVA would be invalid. The researcher found no significance on research question one.

Research question 2. The purpose of this question is to examine if there is an impact on graduation rates based on the performance funding model being utilized at four-year public institutions in the State of Missouri. Such an impact would measure degree completion of additional students. The funding model is being used to predict the impact on graduation rates:

> R_2: Does performance funding policy have an impact on graduation rates at Missouri's four-year public institutions between 1997 and 2018? (v.1, v.N, and v.2)

To begin the research on the second question, a Bartlett's test was conducted to determine if there is a small enough variance between the three unequal groups, v.1 (the first performance funding model used between 1993 and 2002), the v.N (the period in which no performance funding model was used), and v.2 (the second performance funding model which started in 2014). For v.1 the data is available from 1997 through 2002, for v.N there is graduation rate data that covers 2003 through 2013, and for v.2 the data covers 2014 through 2018. Table B10 shows the results of the Bartlett's test. Unlike with the retention data, the variance between the three funding models is small enough that it is significant and further research can be conducted using an ANOVA and ANCOVA.

There is a variance of 0.01704 with a sample size of 76 for v.1. It also shows a variance of 0.02519 with a sample size of 143 for v.N. Last the variance for v.2 is 0.3311 with a sample size of 65. The Chi-square value is 7.62982 and the P-value is less than threshold that would indicate significance (0.05) at 0.022. This test concludes that there is homogeneity of variance among the three groups on graduation rates. This means that the outcome of the ANOVA analysis would be valid, the researcher is able to look at the difference in graduation between the three funding models.

Table B11 shows the results of the ANOVA. The ANOVA shows significance at a value of 0.041, which is less than the significance value of 0.05 needed. This validates there is a significant difference between funding and the impact it has had on graduation rates. More importantly, there is a difference between graduation rates between the three funding models.

Next a Tukey post hoc analysis should show whether there is significance between all three funding models or not. Doing a Tukey post hoc analysis helps adjust for the experiment-wise error rate. The experiment-wise error rate corrects for the fact that the more groups you have the more likely significance will occur. It calculates an adjusted significance value between each combination of groups (Field, 2017).

The results of the Tukey post hoc analysis are displayed in Table B12 and show that there is only a significant difference between the first performance funding model v.1 and the period in which no performance funding model was in place v.N. The difference in graduation rate between the two models is an increase of 5.3111%. This concludes there is a significant difference between the first performance funding model and the after the first performance funding model, when no performance funding model was in place.

There was no significant impact from the second performance funding model that was started in 2014.

This indicates that significance has been found regarding the second research question. The funding model seems to have an impact on graduation rates. More particularly, there's a 5.3% increase in the average graduation rate among the 13 public four-year institutions of higher education in Missouri from when the first model of performance funding existed to when the model was abandoned. The improvement in graduation rates did not show until the model was abandoned since graduation rates lag six years. There is no significance in the 0.17% change that occurred when the second performance funding model was introduced.

Table B13 shows the ANCOVA results for the entire model, where once again the three funding models are used to see if there's a significant difference in graduation rates. This time the model has three control variables, the year associated with the graduation rate, the selectivity of the institution, and the size of the incoming cohort. Once again, the ANCOVA model used shows significance, with an adjusted R Squared of 0.798. All variables, except for the year, show significance. This means, from a statistical point of view, that the results of the analysis are validated, and the variables control for additional impact on graduation rates.

Correlation check. Before discussing results, it is important to look if any of the covariates in the ANCOVA for graduation hold significant correlations. If the variables used as covariates corollate closely with the dependent variable it could impact the model and show significance where there is none based on the fixed factor. The results from the correlation analysis between selectivity and graduation rates. With an R squared of 0.811 it accounts for a significant portion of the variability in graduation rates among the institutions at a significance level of 0.01. Selectivity should be removed from the ANCOVA. The results from the year variable correlation also shows significant correlation at 0.129. The year variable should also be dropped from the ANCOVA due to correlation with the dependent variable. Last, the cohort size variable also shows correlation at 0.588 with a significance level of 0.01. This indicates that the ANCOVA model is heavily correlated and should be dropped from the analysis.

Discussion of Results and Future Work

Discussion of results. The null hypothesis for research question one is accepted, there is no measurable impact from performance funding on retention rates at Missouri's four-year public institutions between 2003 and 2018 using the data available. There is no significant difference between the performance funding model and retention rate at four-year public universities in Missouri. The null hypothesis for research question 2 was rejected, as there is a difference in graduation rates at Missouri's four-year public institutions between 199 and 2018. More specifically, the analysis shows that there was an increase in graduation rates after the first performance funding model was abandoned. This is most likely due to the nature of the data, as graduation rates utilize a six-year cohort model and are considered a lagging indicator. Cook and Pullaro (2010) have explained how the lagging nature of graduation rates make it an ineffective tool to measure student outcomes. It is possible this lagging nature of the graduation rate data lead to the full impact of the first performance funding model (v.1) not being evident until after the model was already abandoned. The result of analysis shows that the increase in graduation rates following the period of the first performance funding model was 5.31%.

The analysis also shows that there was no significant difference comparing the first performance funding model (v.1) to the second performance funding model (v.2). The same is true for comparing the second performance funding model (v.2) to the period when no performance funding model was in place (v.N) This means that graduation rates increased only after the first performance funding model (v.1) was abandoned, and since then there has not been a significant difference in graduation rates in Missouri. The

variation in sample sizes required the utilization of the Bartlett's test to ensure homogeneity of multi-variances (Field, 2017). According to Field (2017), this test makes sure the sample sizes, although not consistent, are similar enough for the analysis to be valid. The Bartlett's test did indicate the variance was normal for the graduation rate data among the three groups, but an analysis between only two groups was not conducted.

However, it is important to note that there was a 5.31% average increase in graduation rates among four-year public universities in Missouri after the introduction of performance funding. The lagging nature of the data may have led to a delayed acknowledgement of the results of the policy. This aligns with previous research from Burke and Modarresi (2000) who had seen early indicators of success in the first performance funding model (v.1). It would have been too early to look at graduation rate impacts at that time.

Future work. The researcher sees opportunity for additional research to be conducted in the future. There was no significance in the graduation rate data between the second performance funding model (v.2) and the other two funding methodologies (v1. and v.N). The size of the sample can certainly be the issue here and reproducing this study with additional future data once it becomes available is a recommended. In addition, it is possible to go back further and include additional data supplied by the 13 individual institutions for the first performance funding model (v.1) to add data for 1993 through 1996. The hope is this study will contribute to a future meta-study of performance funding models. In addition, building upon the research of Hillman, Tandberg, and Gross (2014), who argue providing a monetary incentive may make administrators wary of the program, future studies might provide a more in depth look at Missouri's second performance funding model (v.2) by seeing how the dollars received from the performance funding model impacted retention and graduation rates.

From the lens of the researcher's practice, it is important to note how lagging some of the metrics, such as graduation rate, can be in higher education. The hope is this study shows to the various stakeholders that results may not be available during the period in office. In Missouri, the legislature has term limits, limiting both house representatives and senators to two terms of four years. Since graduation rates at four-year publics take six years to calculate, even if a freshman representative introduced legislation in their first year, results would not be published until either year eight or the year after they leave office. In that scenario the assumption is also made that the freshman representative would be reelected. The researcher recommends that any future model should strike a balance between short-term, mid-term, and long-term metrics. A

metric that looks at how many students drop-out of college each term would provide more actional data for institutions of higher education to address in the short-term. Retention rates may be a mid-term metrics, taking a couple of years to see the impact from changes, and graduation rates could be used as long-term metric, taking seven to eight years to see results from actions taken.

Last, it will be important to look at sub sections of the population to avoid unintended consequences. Umbricht, et al. (2017) found that performance funding in Indiana did not lead to more graduates, but instead led to declining admission rates and increased admissions selectivity. This decline was disproportionately among low-income students and minority groups. The researcher recommends a future model include metrics on inputs, such as acceptance rates, and not just outcomes measures, such as degrees attained.

References

A Coordinated Plan for Higher Education in Missouri, (n.d.). Retrieved from https://dhe.mo.gov/blueprint.php

About IPEDS (n.d.). Retrieved from: https://nces.ed.gov/ipeds/aboutIPEDS/

Bledstein, B. (1976). *The culture of professionalism. The middle class and the development of higher education in america*. New York: Norton.

Bound, J., & Turner, S. (2002). Going to war and going to college: Did World War II and the GI Bill increase educational attainment for returning veterans? *Journal of Labor Economics*, *20*(4), 784-815.

Burke, J. C., & Modarresi, S. (2000). To keep or not to keep performance funding: Signals from stakeholders. *The Journal of Higher Education*, *71*(4), 432-453.

Cook, B., & Pullaro, N. (2010). *College graduation rates: Behind the numbers.* Washington, DC: American Council on Education.

Dougherty, K. J., & Natow, R. S. (2015). *The politics of performance funding for higher education: Origins, discontinuations, and transformations*. Baltimore, MD: JHU Press.

Dougherty, K. J., Natow, R. S., Bork, R. H., Jones, S. M., & Vega, B. E. (2013). Accounting for higher education accountability: Political origins of state performance funding for higher education. *Teachers College Record*, *115*(1), n1.

Dougherty, K. J., Natow, R. S., Bork, R. J. H., & Vega, B. E. (2010). The political origins of state-level performance funding for higher education: The cases of Florida, Illinois, Missouri, South Carolina, Tennessee, and Washington. New York, NY: Community College Research Center, Teachers College, Columbia Univ.

Elder, G. H. (1987, June). War mobilization and the life course: A cohort of World War II veterans. In *Sociological Forum* (Vol. 2, No. 3, pp. 449-472). Kluwer Academic Publishers-Plenum Publishers.

Field, A. (2017). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Thousand Oaks, CA: Sage.

Fraser, R. (1988). *A student generation in revolt.* New York: Pantheon.

Geiger, R. L. (2016). *The history of American higher education: Learning and culture from the founding to World War II* (Vol. 80). Princeton University Press.

Ginder, S. A., & Kelly-Reid, J. E. (2013). 2012-13 Integrated Postsecondary Education Data System (IPEDS) Methodology Report. NCES 2013-293. *National Center for Education Statistics*.

Hazelkorn, E. (2015). *Rankings and the reshaping of higher education: The battle for world-class excellence*. New York: Springer.

Heller, H. (2016). *The capitalist university: The transformations of higher education in the United States (1945-2016)*. London, UK: Pluto Press.

Henry, D. D. (1975). *Challenges past, challenges present: An analysis of American higher education since 1930*. San Francisco: Jossey-Bass Publishers.

Hillman, N. W., Tandberg, D. A., & Fryar, A. H. (2015). Evaluating the impacts of "new" performance funding in higher education. *Educational Evaluation and Policy Analysis*, *37*(4), 501-519.

Hillman, N. W., Tandberg, D. A., & Gross, J. P. (2014). Performance funding in higher education: Do financial incentives impact college completions? *The Journal of Higher Education, 85*(6), 826-857.

Liefner, I. (2003). Funding, resource allocation, and performance in higher education systems. *Higher Education*, *46*(4), 469-489.

Mettler, S. (2002). Bringing the state back in to civic engagement: Policy feedback effects of the GI Bill for World War II veterans. *American Political Science Review, 96*(2), 351-365.

Miao, K. (2012). Performance-based funding of higher education: A detailed look at best practices in 6 states. *Center for American Progress*.

Missouri Department of Higher Education. (2016). Performance Funding [PDF]. Retrieved from https://dhe.mo.gov/documents/PerformanceFundingfinal.pdf

Naughton, B. A. (2004). The efficacy of state higher education accountability programs (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. Digital Dissertations AAT 3145567

Orton, J. D., & Weick, K. E. (1990). Loosely coupled systems: A reconceptualization. *Academy of management review*, *15*(2), 203-223.

Performance Funding in Missouri, (n.d.). Retrieved from https://dhe.mo.gov/PerformanceFunding.php

Rutherford, A., & Rabovsky, T. (2014). Evaluating impacts of performance funding policies on student outcomes in higher education. *The Annals of the American Academy of Political and Social Science*, *655*(1), 185-208.

Schmidt, P. (2002, November 29). Dashed hopes in Missouri. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com

Serban, A. M., & Burke, J. C. (1998). Meeting the performance funding challenge: A nine-state comparative analysis. *Public Productivity & Management Review*, 157-176.

Stein, R. B. (2002). Integrating budget, assessment and accountability policies: Missouri's experiment with performance funding. In J. C. Burke (Ed.) *Funding public colleges and universities for performance: Popularity, problems, and prospects* (pp. 107–132). Albany, NY: State University of New York Press.

Stein, R. B., & Fajen, A. L. (1995). Missouri's funding for results initiative. *New Directions for Higher Education, 1995*(1), 77–90.

Thompson, K. (1969). Constitutional Theory and Political Action. *1*(3), 655-681.

Umbricht, M. R., Fernandez, F., & Ortagus, J. C. (2017). An examination of the (un) intended consequences of performance funding in higher education. *Educational Policy*, *31*(5), 643-673.

Weick, K. (1983). Educational organizations as loosely coupled systems. In J. Baldridge & T. Deal (Eds.), *The dynamics of organizational change in education* (pp. 15-37). Berkeley, CA: McCutchan Publishing Corporation. (Reprinted from *Administrative Science Quarterly, 23,* pp. 541-552, 1978)

SECTION SIX – LEADERSHIP REFLECTION

In this leadership development reflection, I will look back on the knowledge I have gained while progressing through State-wide Cooperative Ed.D Program. I will synthesize this knowledge and weave it through my practice as an educational leader in higher education. I will address four main themes, 1) leadership theory and practice, 2) organizational analysis, 3) policy analysis, and 4) content and context for learning. Throughout the entire reflection, I will address items related to ethics and diversity. Last, I will present a summary combining all the knowledge gained and how it has impacted my practice.

Leadership Theory and Practice

Levi (2017) indicates that developing the ability to lead a team well involves learning through feedback and practice. Northouse (2016) goes on further to explain that leadership is complex and multidimensional, having gained attention from researchers globally. Kotter (1990/2011) highlights how leadership is different from management, explaining that in modern America, organizations tend to over-manage and under-lead. Furthermore, Northouse (2016), shows how different lenses and theories can explain leadership, such as the skill approach, trait approach, situational approach, or a behavioral approach.

As shown by the literature explored during the course work and the dissertation process, leadership is broad and has many different interpretations. Leadership theory and practice have both been exciting topics to me throughout the program. Before starting the program, I had a narrow vision of what leadership meant; it mostly focused on leading a department. However, during the first summer of the program, I learned that leadership is

far more extensive. A change in the understanding of leadership was only emphasized more in the first fall semester, in which we explored several different leadership theories. I feel the combination of both semesters set me up to look at leadership in all our coursework. For example, it has prepared me to understand different leadership styles that are needed when analyzing policy or developing curricula for adult learners. This skillset aided the work during the dissertation process.

During my time in the program, I have had two changes in my practice. During the first semester of the program, I became the Director of Institutional Research at Northwest Missouri State University. I went from being a member of the team to becoming the leader of the team. Such a change, according to Levi (2017), can bring complications to a group through the introduction of new leadership styles in contrast with specific previous knowledge and skills no longer being present. My dynamic with the director earlier was one of mutual respect and one where I played a role where I could freely and openly challenge the direction of the team. Looking back, it did not take me long to realize that the change in the group could result in groupthink. According to Janis (1971/2005), groupthink occurs when members of a team do not criticize their ideas nor do they challenge the direction the team is heading, blindly following the leader and the rest of the unit without reflecting on alternative views. Levi (2017) indicates that through awareness, organizations can avoid groupthink. Once the team was aware of the missing skill, we adjusted quickly, and when it came time to backfill a position, we made sure the person filling that role was comfortable challenging thoughts and ideas different from the rest of the group.

The second change in my leadership situation is more recent. At the end of the course work and at the beginning of my dissertation process, my institution named me the new Assistant Vice President of Institutional Research and Effectiveness. With this change comes a whole new look at leadership. My role now includes facilitating both the strategic planning efforts of the university as well as helping senior leadership with knowledge sharing and prioritization work. My approach to this change is to incorporate different leadership theories as needed. One of those, as it relates to strategic planning, is the path-goal theory. The path-goal theory integrates motivation principles into the theory of leadership and includes four different leadership styles to be utilized pending the motivational factors of the followers (Northouse, 2016). Strategic planning, in my opinion, requires buy-in from all areas of the institutions. Through the path-goal leadership theory, I can utilize four different styles of leadership to get buy-in on the strategic planning efforts. For example, when needed, I can be directive. According to Northouse (2016), this style is called for when the work is ambiguous and complex. Another method is being supportive. This style, Northouse (2016) explains, can assist with repetitive tasks. This one I can see being valuable for those leaders who have gone through several iterations of strategic planning at the institution. The dissertation process itself helped tremendously in this new role, which requires collaboration at all levels of leadership. The committee work I have done during the dissertation process allowed me to learn that skill both in an educational setting and a work setting.

Besides those members who have been on the strategic planning team for a while, some members come on and off based upon their roles at the institutions. Both staff and faculty at the institution can serve on a senate or council that represents their employee

classification. The executive leadership from both groups serve for a limited time on the strategic planning team. In my opinion, it is essential to manage such changes which can be challenging to achieve. My dissertation process again assisted in this change, especially when there was a change made to my committee. Levi (2017) highlights the importance of onboarding members and reestablish ground rules whenever adding new members or when conflict arises. As indicated by Heifetz and Laurie (1990/2011), conflict often has deeper roots than the surface problem visible during the conflict. As a leader, it is crucial to dig deeper to understand the underlying phenomena to be effective (Heifetz & Laurie, 1990/2011).

Organizational Analysis

Besides specific leadership styles and theories, it is also essential to understand the dynamics of an organization. Bolman and Deal (2013) do this by looking at organizations through four different frames, the structural frame, the human resources frame, the political frame, and the symbolic frame.

Structural Frame

The structural frame is a scientific look at an organization; it focuses on how pieces of the organization are structured (Bolman & Deal, 2013). Furthermore, Bolman and Deal (2013) highlight that the structural frame is the earliest attempt at looking at how organizations operate. Within the structural frame is work from Taylor's (1916/2005) principles of scientific management, which through measurement and observations, attempts to explain efficiency. Research by Weick (1978/1983), who describes educational institutions operations as loosely coupled systems, also fits within the structural frame.

The evolution of my leadership has made me realize it is essential to understand an organization from the structural framework; in my opinion, it provides a logical lens. My department, Institutional Research and Effectiveness (IRE), operates under the Vice President of Culture, who besides IRE also oversees human resources and the university police department. We are one of six vice president areas at the university, all of which report to the university president. Within my unit, reporting lines are clear, and approval processes are well described. Outside my area, the other five vice president areas, reporting lines are different, and this causes some confusion as it is inconsistent. As mentioned by Weick (1978/1983), it is common for education to have different areas that are loosely coupled, meaning that there are multiple ways to achieve the same goal. Looking at my organization through this frame makes me a better leader, it makes me realize there are times in which I should go up through my own Vice President of Culture, but it also makes me realize that I can achieve similar outcomes by working with other vice presidents, sidestepping, when appropriate, the logical structure of our unit. The dissertation process also highlighted this need to work with various members of the community. I have received valuable feedback from not only my dissertation advisor, but also from other committee members as well as other faculty in the program and former students. Knowing when to reach out, and to whom to reach out, was a learning process.

Human Resources Frame

The second frame that Bolman and Deal (2013) address is the human resources frame, which focuses on people, how they can be change agents, and how they should be empowered, which leads to a possible increase in morale within an organization. Within my department, I try to operate within the human resources frame. I do this by

empowering my employees to make decisions on their own. Bolman and Deal (2013) highlight how it is important to emphasize support using this framework. I have an open communication style with my staff. For example, my team knows that if I do not like a decision that was made by one of them, I will address it one-on-one and not in public. In public, I will support their choice; this gives them comfort and makes them feel empowered. By being able to address a mistake one-on-one learning is occurring in a comfortable setting. I also believe strongly in the idea that if we are performing well, the credit goes to the team. In contrast, whereas if something goes wrong, it is my fault, and not the teams' failure.

I want to emphasize that this leadership style has not come to me quickly. My StrengthQuest finding did not show that I had strengths in this area. It takes a constant effort on my part to remember to keep this in mind, even now in the dissertation process. Levi (2017) indicates that it is possible to force missing skills in a group setting or a team via establishing group norms. Within our department, each member knows they have been empowered to make decisions and that I will not be calling them out if they make a wrong decision in public. This standard is an example of a group norm established in our department that helps me operate more effectively within the human resources frame. Besides, Levi (2017) explains how group norms can assist when conflict arises by establishing appropriate behavior during different situations.

Political Frame

The political frame is the framework I am most comfortable operating within. Bolman and Deal (2013) describe this frame as a political landscape, focusing on coalitions and power. Within the political framework are overbounded systems, in which

power has a high concentration, and underbounded systems, which operate through decentralization of power (Bolman & Deal, 2013). French and Raven (1959/2005) describe five different bases of power, coercive, reward, legitimate, referent, and expert power. Throughout my leadership, I have operated mostly within the expert power base since my job requires high technical and analytical skills.

During the last five years, I have been operating within the legitimate power base; being comfortable with this transition has taken me some time. Johnson (2018) discusses how those that have decision power can be perceived differently despite the content knowledge a person has. Levi (2017) highlights the processes by which teams can come to a consensus agreement through listening, respecting, and allow differentiating ideas during meetings. I must admit that this was a struggle for me, but I now understand how important this is to avoid groupthink.

Symbolic Frame

Last, ideas in the symbolic frame, according to Bolman and Deal (2013), are the influences of an organization's culture, beliefs, and values. Understanding these elements, in my opinion, are essential when instituting change at an organization. Traditions can be an active resistor to change (Heifetz & Laurie, 1990/2011). This resistance has been evident at my institution during strategic planning across the past eight years. During these eight years, we have been able to go through three separate versions of a strategic plan without too much resistance. In contrast, changing the mission, vision, and values of our institution has been a harder proposition, and one that has not been successful yet. As I conclude my dissertation process, I hope to approach a review of our mission, vision, and values through the symbolic framework.

Policy Analysis

Besides understanding leadership theories and how an organization operates through different frameworks, it is also essential to understand how policy has an impact on practice. Working at a higher education institution, we have many different agents trying to assert doctrines to achieve outcomes. These include, but are not limited to, federal and state government policies, accreditation policies, legal policies, and internal policies. According to Bardach and Patashnik (2016), policies are both social and political activities attempting to solve or improve a problem.

Policy impacts can be measured through two different concepts, policy outputs, "things actually done by agencies in pursuance of policy" (p. 290) and policy outcomes, which can be measured as the impact on society (Anderson, 2014). As a practitioner, reading this made me understand the differences in which people judge the success of a policy. As an example, a new policy attempting to improve the academic achievement of minority students can have an output of an increased graduation rate. This policy can impact many different areas of a university, but it can also have negative impacts on society. For example, say the graduation rate increased, which in the eyes of the policy is a welcomed output, but achieving this increase was because the admissions office admitted only the higher prepared students. The policy outcome and impact on society would be that fewer minority students are now attending college and earning a degree.

This negative outcome and positive impact in the previous example has stuck with me; it aligns closely with the concept of implicit bias. According to Johnson (2018), implicit bias refers to thoughts, feelings, and actions we take without knowing our internal upbringing influences us. The admissions office, in the earlier example, should

not be blamed in my opinion. In their worldview, admission standards have a strong correlation with academic success, when instead, it is only a small piece of the puzzle that is student success. Research from Sulaiman and Mohezar (2006) has shown that many factors contribute to student success. This example only further highlights the importance of policy analysis.

In my practice, my office is often asked to measure the impact of a policy. In these situations, we usually receive the concept of what we should measure. However, reflecting has made me realize that the measures suggested are often policy outputs and not outcomes. As a department, we now ask for a copy of the policy, interpret the policy on our own, and then have a conversation with different stakeholders on their interpretation and goals for the policy. Adding this request has resulted in us being able to explore the outcomes of policies, instead of only being focused on the outputs of policies. It is crucial to have the right stakeholders represented while gathering information on how to measure the output and outcomes of a policy (Bardach & Patashnik, 2016). In addition, the dissertation process has really shown the need to do a review of literature on topics we analyze.

Besides being asked to measure the impact of a policy, we are also involved in forming new policies. Bardach & Patashnik's (2016) eightfold path on policy analysis includes the following eight steps, 1) define the problem, 2) assemble some evidence, 3) construct the alternatives, 4) select the criteria, 5) project the outcomes, 6) confront the trade-offs, 7) stop, focus, narrow, deepen, decide, and 8) tell your story. During our coursework on policy analysis, I found following these eight steps extremely beneficial. In my practice, I have learned that situations arise in which to skip specific steps. As an

example, through work with the Missouri General Assembly and the Missouri Department of Higher Education and Workforce Development, I have been part of a task force to look at the performance funding measures being used to evaluate the public institutions in the State of Missouri. Our task was only to look at the measures currently being used and propose changes to them. This limiting scope resulted in skipping several steps, such as defining the problem, assembling appropriate evidence, and projecting the outcomes.

During the process of evaluating the measures and proposing changes, I started realizing that the events unfolding were best interpreted through the political frame. The political framework involves power, agendas, and influence (Bolman and Deal, 2013). As soon as I realized the taskforce was there to achieve a political outcome while showing the illusion that stakeholders were involved, I started asking many of the questions that the eightfold path suggests. In doing so, I was able to get some more productive and in-depth discussions. The part I am most proud of relates to equity; I was able to insert into the performance funding model a Pell eligibility weight for specific measures. The Pell grant is a federal financial aid award available to lower-income families to send their students to college (Baime & Mullin, 2011). It is important to note though, that Pell eligibility is not a perfect measure for low income, it has many limitations, but is readily available for comparison among higher education institutions (Tebbs & Turner, 2005). Using such measures of accountability has been utilized in K-12 education for a lot longer than higher education, but they have become more common in higher education (Loss & McGuinn, 2016). This involvement led me to writing this dissertation.

Content and Context for Learning

A successful leader adjusts and helps others improve. Therefore, it is vital to understand how team members learn (Chatalalsingh & Reeves, 2014). According to Chen (2014), adults prefer a self-directed learning style. It is also important to realize that adults come into a learning situation with preconceived worldviews (Merriam & Bierema, 2014). Chatalalsingh and Reeves (2014) discuss how a top-down approach to learning within a team can result in fear, hindering learning. While Gill (2010) explains that for an organization to perform at a high level, it is essential the entire organization learns.

Each year my department gets together at an annual retreat to plan for the upcoming year and to learn from each other. The very first year I implemented this retreat, I took a top-down approach. I led most sessions during the day. After the day was over, I heard back from my staff that they did not feel the day had been successful. In reflecting, I realized that my top-down approach had hindered their adult learning. In the next retreat, I took a step back, offering only an introduction to the day and allowing my staff to provide different sessions. This type of learning can help individuals within an organization learn as a team (Gill, 2010; Levi, 2017). It made me realize that in the first retreat I had only brought my worldview to the retreat, instead of introducing everyone to different worldviews, which in my opinion can help adults realize that they are coming to the learning environment with preconceived values.

Through the StrengthQuest finder we took during our first summer in the program; I learned that ideation and learner are two of my top strengths. Clifton, Anderson, and Schreiner (2006) indicate that “those who align with this theme [ideation]

are delighted when they discover beneath the complex surface an elegantly simple concept to explain why things are the way they are" (p. 51). The learner theme involves an individual always striving to gain new knowledge (Clifton, Anderson, & Schreiner, 2006). These strengths have made me realize I have a natural tendency to learn new concepts and ideas, but not everyone has these themes as strengths.

Johnson (2018) addresses the fact that all of us come to the table with certain privileges. One of my privileges is that I like to learn, and I realize that may not be the case for everyone on my team. The organizational context can have a significant impact on the performance of a team (Levi, 2017). If I can frame the learning activities for my team, such as our annual retreat, into the correct context, I will be able to improve upon the commitment of my team members. Having commitment and buy-in on team activities can ease the work of the leader (Levi, 2017, Heifetz & Laurie, 2011)

Levi (2017) talks about how individuals on a team can make others improve their performance through their differences. I have since realized that members of my team learn in different ways. Therefore, I take different approaches to learning activities with my team than I would with myself. Caffarella & Daffron (2013) talk about the importance of assessing adult learning programs to measure success and improve the outcomes. After the retreat, I met with different team members to gather feedback to see if the format we are using now is an improvement over the previous setup. According to Newcomer, Hatry, and Wholey (2015), it is vital to have some evaluation at the end of a program to gather insights into how effectively the program achieved its outcomes.

Last, I want to highlight one of my differences, having grown up in Europe, my educational equivalent of the American K-12 experience was different. This different lens

allows me to take a step back and often ask additional clarifying questions. During these situations, I make sure to show respect to the other people involved, I listen, and I take notes. A good leader, according to Northouse (2016), can listen and show respect while doing so. Northouse (2016) goes further and shows how listening skills and reflection skills are incorporated into different leadership theories. For myself, the more important aspect is that not just me, but also the other people involved in the situation are learning together as a team. This lens allows me a glimpse into someone else's worldview without using too many technical terms. As Johnson (2018) indicates, we should be celebrating our differences as they provide richness in our lives.

Summary

Reflecting on my leadership through the course content we have covered, the literature we have reviewed, the dissertation process, and my practice has been a welcoming experience. It has made me realize that there are many different aspects to what leadership is, what good leadership looks like, and how leadership should be applied. There are many different lenses through which a leader can look at their actions. I now feel that I have a brand-new toolkit that allows me to look at leadership in different ways. I now have all these various tools available, which will enable me to function as a well-rounded leader in many different situations. I also want to highlight that through the program, I have become far more aware of my weaknesses and limitations. I have also learned that being aware of those can help you improve in those areas. In my opinion, a good leader knows many different styles and theories on leadership, can look through different lenses to interpret situations, knows the impact of policies, and understand that

all of us learn in different ways and that we should never stop learning. Last, we should all celebrate our differences.

References

A Coordinated Plan for Higher Education in Missouri, (n.d.). Retrieved from https://dhe.mo.gov/blueprint.php

About IPEDS (n.d.). Retrieved from: https://nces.ed.gov/ipeds/aboutIPEDS/

Alon, S., & Tienda, M. (2005). Assessing the "mismatch" hypothesis: Differences in college graduation rates by institutional selectivity. *Sociology of Education*, *78*(4), 294-315.

Altbach, P. (2006). The dilemmas of ranking. *International Higher Education*, (42), 2-3.

Anderson, J. E. (2014). *Public policymaking*. Boston, MA: Wadsworth/Cengage Learning.

Anonymous. (1971, November 12). 'Little Hoover' asks sweeping changes. *Daily Capital News,* p. 2.

Anonymous. (1972, October 26). Bond proposes 'superboard' for colleges universities. *The Joplin Globe,* p. 9A.

Arnold, P. E. (1976). The first hoover commission and the managerial presidency. *The Journal of Politics*, *38*(1), 46-70.

Bailey, T., Calcagno, J. C., Jenkins, D., Leinbach, T., & Kienzl, G. (2006). Is student-right-to-know all you should know? An analysis of community college graduation rates. *Research in Higher Education*, *47*(5), 491-519.

Baime, D. S., & Mullin, C. M. (2011). Promoting educational opportunity: The Pell Grant program at community colleges. *Washington, DC: AACC Policy Brief*.

Bardach, E., & Patashnik, E. M. (2016). *A practical guide for policy analysis: The eightfold path to more effective problem solving*. (5th ed.). Thousand Oaks, CA: CQ Press.

Bledstein, B. (1976). *The culture of professionalism. The middle class and the development of higher education in america*. New York: Norton.

Bolman, L. G. &, Deal, T. E. (2013). *Reframing organizations: Artistry, choice, & leadership* (5th ed.). San Francisco; Jossey-Bass.

Bound, J., & Turner, S. (2002). Going to war and going to college: Did World War II and the GI Bill increase educational attainment for returning veterans? *Journal of Labor Economics*, *20*(4), 784-815.

Brubacher, J. (2017). *Higher education in transition: History of American colleges and universities*. London, UK: Routledge.

Burke, J. C., & Modarresi, S. (2000). To keep or not to keep performance funding: Signals from stakeholders. *The Journal of Higher Education*, *71*(4), 432-453.

Caffarella, R. S., & Daffron, S. R. (2013). *Planning programs for adult learners: A practical guide* (3rd ed.). San Francisco, CA: Jossey-Bass.

Cafferky, M. (2010). *Breakeven Analysis: The definitive guide to cost-volume-profit analysis*. New York: Business Expert Press.

Campbell, R. R. (1967). Population and Higher Education in Missouri, 1960-1975.

Church, J. (1973, December 7). Bond, senators talk reorganization issues. *The Joplin Globe,* p. 1E.

Clifton, D. O., Anderson, E., & Schreiner, L. (2006). *StrengthsQuest: Discover and develop your strengths in academics, career, and beyond* [PDF file]. New York: Gallup.

Cook, B., & Pullaro, N. (2010). *College graduation rates: Behind the numbers.* Washington, DC: American Council on Education.

Coordinating Board for Higher Education. (2017). *Organizational Information* [PDF file]. Retrieved from https://dhewd.mo.gov/cbhe/boardbook/documents/tabr1217.pdf

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.

Cuéllar, M. F. (2009). " Securing" the nation: Law, politics, and organization at the federal security agency, 1939–1953. *The University of Chicago Law Review*, 587-718.

DeBerard, M. S., Spielmans, G., & Julka, D. (2004). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College Student Journal*, *38*(1), 66-80.

Dougherty, K. J., & Natow, R. S. (2015). *The politics of performance funding for higher education: Origins, discontinuations, and transformations*. Baltimore, MD: JHU Press.

Dougherty, K. J., Natow, R. S., Bork, R. H., Jones, S. M., & Vega, B. E. (2013). Accounting for higher education accountability: Political origins of state performance funding for higher education. *Teachers College Record*, *115*(1), n1.

Dougherty, K. J., Natow, R. S., Bork, R. J. H., & Vega, B. E. (2010). The political origins of state-level performance funding for higher education: The cases of Florida, Illinois, Missouri, South Carolina, Tennessee, and Washington. New York, NY: Community College Research Center, Teachers College, Columbia Univ.

Elder, G. H. (1987, June). War mobilization and the life course: A cohort of World War II veterans. In *Sociological Forum* (Vol. 2, No. 3, pp. 449-472). Kluwer Academic Publishers-Plenum Publishers.

Field, A. (2017). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Thousand Oaks, CA: Sage.

Fraser, R. (1988). *A student generation in revolt.* New York: Pantheon.

French, J. R., & Raven, B. (2005). The bases of social power. In J. M Shafritz, J. S. Ott, & Y. S. Jang (Eds.), *Classics of organization theory* (6th ed., pp. 311-320). Belmont, CA: Wadsworth. (Reprinted from *Studies in social power*, pp. 150-167, by D.P. Cartwright, Ed., 1959, Ann Arbor, MI: Institute for Social Research, University of Michigan)

Galloway, N. (2017). Department of Higher Education Performance Funding (Report No. 2017-001). Jefferson City, MO: Office of Missouri State Auditor.

Galvan, J. L., & Galvan, M. C. (2017). *Writing literature reviews: A guide for students of the social and behavioral sciences* (7th ed.). Glendale, CA: Pyrczak Publishing.

Geiger, R. L. (2016). *The history of American higher education: Learning and culture from the founding to World War II* (Vol. 80). Princeton University Press.

Gill, S. J. (2010). *Developing a learning culture in nonprofit organizations*. Los Angeles: CA: Sage.

Ginder, S. A., & Kelly-Reid, J. E. (2013). 2012-13 Integrated Postsecondary Education Data System (IPEDS) Methodology Report. NCES 2013-293. *National Center for Education Statistics*.

Hazelkorn, E. (2015). *Rankings and the reshaping of higher education: The battle for world-class excellence*. New York: Springer.

Heifetz, R. A., Laurie, D. L. (2011). The work of leadership. In *Harvard Business Review's 10 Must Reads on Leadership* (pp. 57-78). Boston, MA: Harvard Business Review Press. (Reprinted from *Harvard Business Review, 68*(3), 103-111, 1990)

Heller, D. E. (2004). Pell Grant recipients in selective colleges and universities. *America's untapped resource: Low-income students in higher education*, 157-166.

Heller, H. (2016). *The capitalist university: The transformations of higher education in the United States (1945-2016)*. London, UK: Pluto Press.

Henderson, A. D. (1974). *Higher education in America:[Problems, priorities, and prospects]*. San Francisco: Jossey-Bass Publishers.

Henry, D. D. (1975). *Challenges past, challenges present: An analysis of American higher education since 1930*. San Francisco: Jossey-Bass Publishers.

Hillman, N. W., Tandberg, D. A., & Fryar, A. H. (2015). Evaluating the impacts of "new" performance funding in higher education. *Educational Evaluation and Policy Analysis*, *37*(4), 501-519.

Hillman, N. W., Tandberg, D. A., & Gross, J. P. (2014). Performance funding in higher education: Do financial incentives impact college completions? *The Journal of Higher Education, 85*(6), 826-857.

Hillstrom, L. C. (2020). *The College Affordability Crisis.* ABC-CLIO.

Integrated Postsecondary Education Data System. (2018). *Institutional characteristics* [Data file and code book]. Retrieved from https://nces.ed.gov/ipeds/datacenter/DataFiles.aspx

Janis, I. (2005). Groupthink: The Desperate Drive for Consensus at Any Cost. In J.M. Shafritz, J.S. Ott & Y.S. Jang (Eds.), *Classics of organization theory* (6th ed., pp. 185-192). Belmont, CA: Wadsworth, Cengage Learning. (Reprinted from *Psychology Today*, pp. 43-44, 46, 74-76, 1971)

Johnson, A. G. (2018). *Privilege, power, and difference* (3rd ed.). New York: McGraw-Hill.

Jordan, M. M., & Hackbart, M. M. (1999). Performance budgeting and performance funding in the states: A states assessment. *Public Budgeting & Finance*, *19*(1), 68-88.

Kotter, J. P. (2011). What leaders really do. In *Harvard Business Review's 10 Must Reads On Leadership* (pp. 37-55). Boston, MA: Harvard Business Review Press. (Reprinted from *Harvard Business Review, 68*(3), 103-111, 1990)

Kuh, G. D., Kinzie, J. L., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature* (Vol. 8). Washington, DC: National Postsecondary Education Cooperative.

Lahr, H. E., Pheatt, L. E., Dougherty, K. J., Jones, S. M., Natow, R. S., & Reddy, V. T. (2014). *Unintended impacts of performance funding on community colleges in three states*. New York, NY: Community College Research Center, Teachers College, Columbia University.

Lazerson, M. (1998). The disappointments of success: Higher education after World War II. *The annals of the American Academy of Political and Social Science, 559*(1), 64-76.

Levi, D. (2017). *Group dynamics for teams* (5th ed.). Thousand Oaks, CA: Sage.

Liefner, I. (2003). Funding, resource allocation, and performance in higher education systems. *Higher Education*, *46*(4), 469-489.

Loss, C. P., & McGuinn, P. J. (2016). *The Convergence of K-12 and Higher Education: Policies and Programs in a Changing Era. Educational Innovations Series.* Harvard Education Press.

Lucas, C. (1994). *American higher education: A history*. New York: St. Martin's Press.

Lykes, R. W. (1975). *Higher Education and the United States Office of Education, 1867-1953.* Bureau of Postsecondary Education, United States Office of Education.

McPherson, P., & Shulenburger, D. (2006). Toward a voluntary system of accountability program (VSA) for public universities and colleges. *National Association of State Universities and Land-Grant Colleges*.

MDHE Statistical Summary. (2018). *Enrollment and Demographics* [Data file]. Retrieved form https://dhe.mo.gov/data/statsum/

Meltsner, A. J. (1972). Political feasibility and policy analysis. *Public Administration Review*, 859-867.

Merriam, S. B., & Bierema, L. L. (2014). *Adult learning: Linking theory and practice.* San Francisco, CA: Jossey-Bass.

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.

Mettler, S. (2002). Bringing the state back in to civic engagement: Policy feedback effects of the GI Bill for World War II veterans. *American Political Science Review, 96*(2), 351-365.

Miao, K. (2012). Performance-based funding of higher education: A detailed look at best practices in 6 states. *Center for American Progress*.

Miles, R. E. (1974). *The department of health, education, and welfare* (No. 39). New York: Praeger.

Miller, M. A. (2008). The voluntary system of accountability: Origins and purposes: An interview with George Mehaffy and David Shulenberger. *Change: The Magazine of Higher Learning*, *40*(4), 8-13.

Mintzberg, H. (2005). The five basic parts of the organization. In J. M. Shafritz, J. S. Ott, & Y.S. Jang (Eds.), *Classics of organization theory* (6th ed., pp. 219-230). Belmont, CA:

Missouri Department of Higher Education. (2016). Performance Funding [PDF]. Retrieved from https://dhe.mo.gov/documents/PerformanceFundingfinal.pdf

Missouri Revised Statutes: Mo. Rev. Stat. § 163.191 (2014)

Mitchell, M., Leachman, M., & Masterson, K. (2017). A lost decade in higher education funding: State cuts have driven up tuition and reduced quality. Center on Budget and Policy Priorities, Washington, DC.

Mulligan, Z. (2019). *Missouri Higher Education History Institutions and CBHE.* [Personal Communication]. Unpublished

Naughton, B. A. (2004). The efficacy of state higher education accountability programs (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. Digital Dissertations AAT 3145567

Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (2015). *Handbook of practical program evaluation*. Hoboken, NJ: John Wiley & Sons.

Northouse, P. G. (2016). *Leadership: Theory and practice*. Thousand Oaks, CA: Sage.

Olson, J. C. (1993). *Serving the University of Missouri: a memoir of campus and system administration*. University of Missouri Press.

Orton, J. D., & Weick, K. E. (1990). Loosely coupled systems: A reconceptualization. *Academy of management review*, *15*(2), 203-223.

Overview of Title IV, (n.d.). Retrieved from https://fsapartners.ed.gov/knowledge-center/library/functional-area/Overview%20of%20Title%20IV

Performance Funding in Missouri, (n.d.). Retrieved from https://dhe.mo.gov/PerformanceFunding.php

Perna, L. W., & Finney, J. E. (2014). *The attainment agenda: State policy leadership in higher education*. Baltimore, MD: JHU Press.

Phillips, C. A. (1911). *A History of Education in Missouri: The Essential Facts Concerning the History and Organization of Missouri's Schools*. Hugh Stephens Printing Company.

Pusser, B., & Marginson, S. (2012). The elephant in the room: Power, politics, and global rankings in higher education. In M. N. Bastedo (Ed.), *The organization of*

higher education: Managing colleges for a new era (pp. 86-117). Baltimore, MY: The John Hopkins University Press.

Romzek, B. S. (2000). Dynamics of public sector accountability in an era of reform. *International Review of Administrative Sciences, 66*(1), 21-44.

Rutherford, A., & Rabovsky, T. (2014). Evaluating impacts of performance funding policies on student outcomes in higher education. *The Annals of the American Academy of Political and Social Science*, *655*(1), 185-208.

Saltman, E. K. J. (2010). From Carnegie to Gates: The Bill and Melinda Gates Foundation and the venture philanthropy agenda for public education. In *The Gates foundation and the future of US public schools* (pp. 17-36). Routledge.

Saupe, J.L. (1990), The Functions of Institutional Research, The Association of Institutional Research, Tallahassee, FL.

Sulaiman, A., & Mohezar, S. (2006). Student success factors: Identifying key predictors. *Journal of Education for Business*, *81*(6), 328-333.

Schmidt, P. (2002, November 29). Dashed hopes in Missouri. *The Chronicle of Higher Education*. Retrieved from http://chronicle.com

Schmiesing, K. (2006). The Department of Education battle, 1918–1932: Public Sschools, catholic schools, and the social order by Douglas J. Slawson. *Catholic Social Science Review*, *11*, 340-342.

Scott, M., Bailey, T., & Kienzl, G. (2006). Relative success? Determinants of college graduation rates in public and private colleges in the US. *Research in Higher Education*, *47*(3), 249-279.

Serban, A. M., & Burke, J. C. (1998). Meeting the performance funding challenge: A nine-state comparative analysis. *Public Productivity & Management Review*, 157-176.

Stein, R. B. (2002). Integrating budget, assessment and accountability policies: Missouri's experiment with performance funding. In J. C. Burke (Ed.) *Funding public colleges and universities for performance: Popularity, problems, and prospects* (pp. 107–132). Albany, NY: State University of New York Press.

Stein, R. B., & Fajen, A. L. (1995). Missouri's funding for results initiative. *New Directions for Higher Education, 1995*(1), 77–90.

Stolz, I., Hendel, D. D., & Horn, A. S. (2010). Ranking of rankings: Benchmarking twenty-five higher education ranking systems in Europe. *Higher Education*, *60*(5), 507-528.

Taylor, F. W. (2005). The principles of scientific management. In J. M. Shafritz, J. S. Ott, & Y.S. Jang (Eds.), *Classics of organization theory* (pp. 61-72). Belmont, CA: Wadsworth. (Reprinted from *Bulletin of the Taylor Soc*iety, 1916)

Tebbs, J., & Turner, S. (2005). Low-income students a caution about using data on pell grant recipients. *Change: The Magazine of Higher Learning*, *37*(4), 34-43.

Thelin, J. R. (2011). *A history of American higher education*. JHU Press.

Thygesen, L. C., & Ersbøll, A. K. (2014). When the entire population is the sample: strengths and limitations in register-based epidemiology. *European Journal of Epidemiology*, *29*(8), 551-558.

Tinto, V. (1975). Dropouts from higher education: A theoretical synthesis of recent literature. *A Review of Educational Research, 45*, 89-125.

Thompson, K. (1969). Constitutional Theory and Political Action. *1*(3), 655-681.

Umbricht, M. R., Fernandez, F., & Ortagus, J. C. (2017). An examination of the (un) intended consequences of performance funding in higher education. *Educational Policy*, *31*(5), 643-673.

Valentine, D. C. (2004). Effective Government: Reorganization of Executive Departments. *Public Policy publications (MU)*.

Vandal, B. (2014). Promoting Gateway Course Success: Scaling Corequisite Academic Support. *Complete College America*.

Walter, S. D., Eliasziw, M., & Donner, A. (1998). Sample size and optimal designs for reliability studies. *Statistics in Medicine*, *17*(1), 101-110.

Weick, K. (1983). Educational organizations as loosely coupled systems. In J. Baldridge & T. Deal (Eds.), *The dynamics of organizational change in education* (pp. 15-37). Berkeley, CA: McCutchan Publishing Corporation. (Reprinted from *Administrative Science Quarterly, 23,* pp. 541-552, 1978)

APPENDIX A

IRB Approval

MU eCompliance

IRB Determination Notice Project #2090537 Review #374900

Project #2090537
Project Title: THE IMPACT OF PERFORMANCE FUNDING ON RETENTION AND GRADUATION METRICS AT FOUR-YEAR PUBLIC UNIVERSITIES IN MISSOURI BETWEEN 1993 AND 2018
Principal Investigator: Egon Heidendal (MU-Student)
Primary Contact: Egon Heidendal (MU-Student)

Dear Investigator,

The MU Institutional Review Board reviewed your application and supportive documents. It has been determined that this project does not constitute human subjects research according to the Department of Health and Human Services regulatory definitions. As such, there are no further IRB requirements.

If you have questions, please feel free to contact the MU IRB office at 573-882-3181 or email at muresearchirb@missouri.edu.

Sincerely,

MU Institutional Review Board

APPENDIX B

Methods and Findings

Methods, findings, discussions, limitations, and recommendations from this study are in this appendix. This researcher in this study examined if there is a significant difference between three versions of funding higher education in the State of Missouri using an ANOVA and ANCOVA. The dependent variables are retention rate and graduation rate. These two dependent variables are used two answer two different research questions, the research questions are listed in Table X. The factor variable is the model of funding in place at the time of the retention and graduation data. The three models of funding are described in Table 5. Data analysis was completed with IBM SPSS 9 (version 26).

Methods

Data collection. Retention rates were acquired for each four-year public university in Missouri from the National Center for Education Statistics (NCES). This center maintains publicly available data on all Title IV funded institutions of higher education in the United States of America, through the Integrated Postsecondary Education Data System (IPEDS). Retention rate is defined as those students who entered a postsecondary education institution as a first-time, full-time freshman, and were retained at the same institution the next year (Integrated Postsecondary Education Data System, 2018).

Graduation rates were also acquired as publicly available data from NCES through IPEDS data collections. Graduation rate is defined as those students who entered a postsecondary education institution as a first-time, full-time freshman, and completed

an undergraduate award within 150% of the length of the program (Integrated Postsecondary Education Data System, 2018). For example, a bachelor's degree that requires four years to complete allows the student to be counted as graduated in the graduation rate if they complete that program within six years of entering the postsecondary institution. An associate degree that requires two years would allow for three years to complete to be counted in an institutions graduation rate.

The data for retention rates was downloaded from IPEDS and transformed to create a new Excel spreadsheet to be imported into SPSS. The spreadsheet was prepared by IPEDS ID, institution name, year, model, retention/graduation rate, as well as additional measure to account for such as year, ACT percentiles, and selectivity of the institution. A similar process was completed for the second Excel spreadsheet using graduation rates, this file included two additional variables, the size of the starting cohort and how many of those students graduated.

Data Analysis. Both Excel spreadsheets were loaded into SPSS and recoding was conducted to identify the models. This was done through recoding the time variable, year, into a categorical variable indicating the funding model (v.1, v.N, and v.2). Despite the retention data only having two groups for comparison, the researcher chose to use an ANOVA analysis to keep outputs and interpretation between research questions consistent. The graduation data does utilize three groups for comparison, the performance funding model used between 1993 and 2002 (v.1), the period where no performance funding model was utilized; 2003 through 2013 (v.N), and the second performance funding model used between 2014 and 2018 (v.2). For the retention analysis only v.N and v.2 data was available to the researcher.

For this study multiple models were built to answer both research questions. For retention the researcher first ran Bartlett's Test, which measures the homogeneity of multi-variances. According to Field (2017), this test should be run to determine whether the variances between several groups are equal. Field (2017) indicates that a one-way ANOVA assumes equal variances across samples. This same test was run for the graduation rate data. Next the ANOVA model was designed as well as the ANCOVA model to account for control variables.

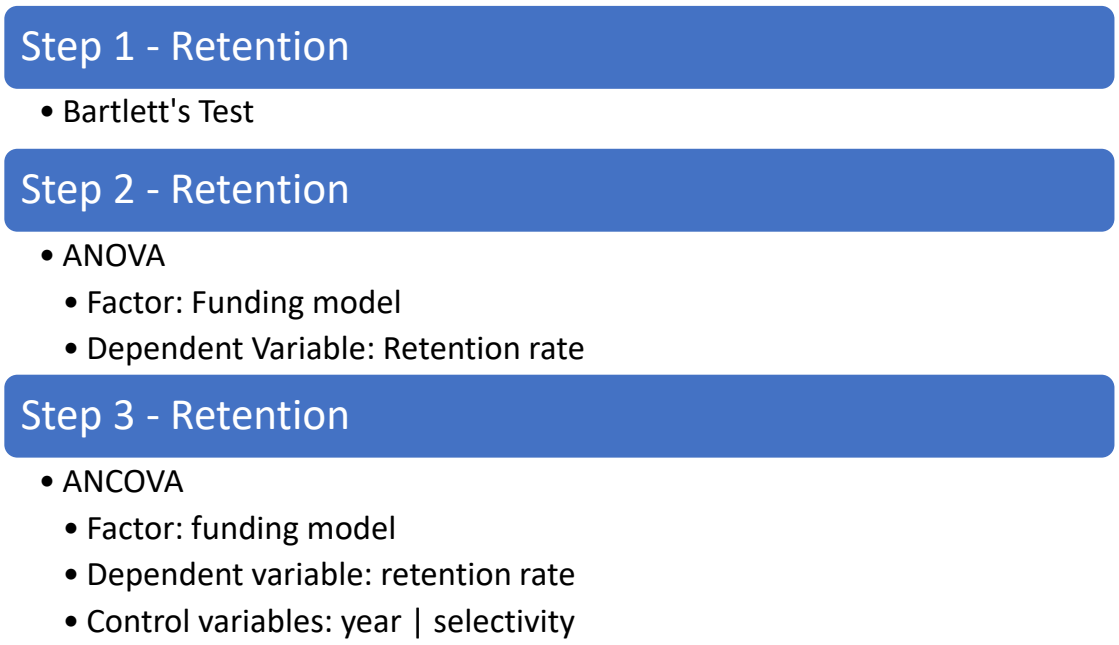


Figure B1. Process of retention rate analysis used in study

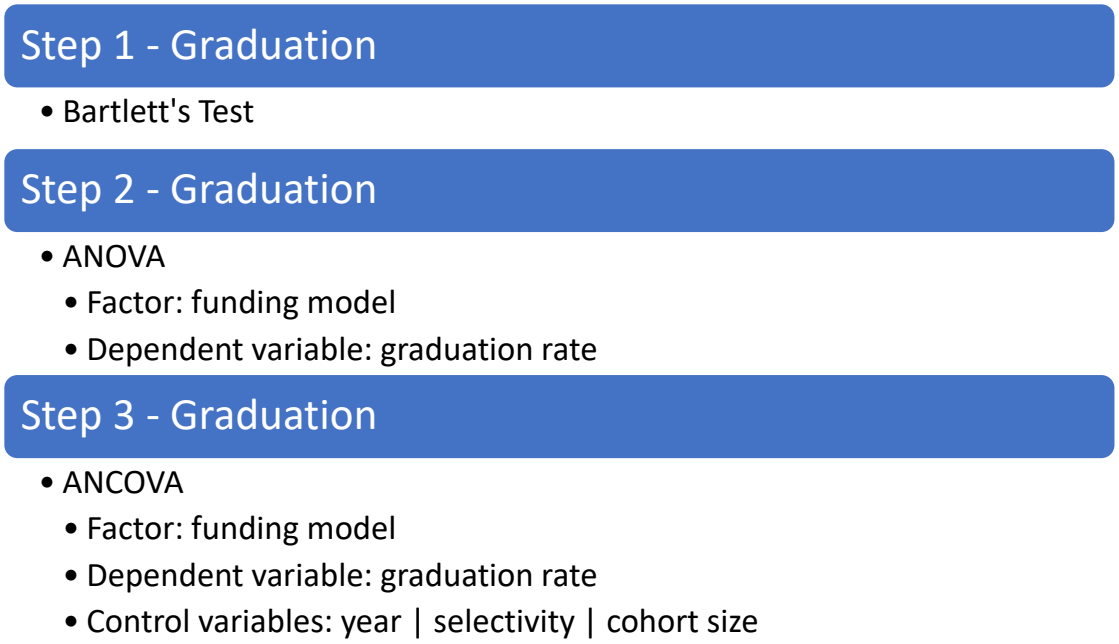


Figure B2. Process of graduation rate analysis used in study

Findings

The purpose of this study is to see if the various funding models in Missouri have had an impact on degree attainment among Missouri residents. The State of Missouri, in

2015, set a goal of 60%-degree attainment among Missouri residents in its strategic plan, a blueprint for higher education in Missouri (A Coordinated Plan for Higher Education in Missouri, n.d.). In addition, previous research has shown that certain performance funding models are successful in attaining goals set out in the model, while others do not (Hazelkorn, 2015; Rutherford & Rabovsky, 2014; Umbricht, Fernandez, & Ortagus, 2017). This research study will add to the literature base by providing additional data on a model previously not researched.

Descriptive statistics. The data used in this study was obtained from the IPEDS data collection through NCES. Metrics included within the data set are the institution's IPEDS ID, the description of the institution, the year related to the data elements, the funding model in place, the retention/graduation rate, the selectivity of the institutions. Also included in the data set is the size of the incoming cohort for the graduation rate data. Table B1 includes the retention statistics, indicating how many data points there were per model, the mean retention rate, the number of data points, the minimum value, the maximum value, and the standard deviation. Table B2 displays the average retention rate per institutions and Table B3 displays the average retention rate per year. Regarding Table B1, v.N refers to the time frame between 2003 and 2012 when there was no performance funding model in place, v.2 refers to the second version of performance funding in Missouri, which covers data from 2014 through 2018.

Table B1

Summary Statistics on Retention Data Between v.N and v.2

	Mean	Minimum	Maximum	N	Std. Deviation
v.N no pf model (2002-2013)	70.13	36	89	143	12.290
v.2 second pf model (2014-2018)	72.08	46	89	65	11.211

Table B2

Summary Statistics on Retention Data Between Institutions

	Mean	Minimum	Maximum	N	Std. Deviation
Harris-Stowe State University	49.31	39	65	16	7.190
Lincoln University	51.00	36	65	16	5.865
Missouri Southern State University	63.56	60	71	16	2.966
Missouri State University	75.50	73	79	16	1.932
Missouri Western State University	62.06	56	68	16	3.530
Northwest Missouri State University	72.37	66	81	16	4.064
Southeast Missouri State University	72.31	69	75	16	2.058
Truman State University	86.13	83	89	16	1.821
University of Central Missouri	71.00	67	74	16	1.789
University of Missouri-Columbia	85.31	84	88	16	1.352
University of Missouri-Kansas City	71.88	48	76	16	6.682
Missouri University of Science and Technology	84.81	81	88	16	2.136
University of Missouri-St. Louis	74.38	68	79	16	3.462

Table B3

Summary Statistics on Retention Data Between Years

	Mean	Minimum	Maximum	N	Std. Deviation
2003	70.00	53	85	13	11.299
2004	70.00	48	87	13	12.288
2005	69.77	50	87	13	11.791
2006	69.92	42	88	13	13.251
2007	70.77	44	86	13	12.444
2008	71.08	45	88	13	12.223
2009	69.23	39	87	13	13.857
2010	69.85	44	86	13	13.196
2011	68.31	36	89	13	15.644
2012	69.77	43	87	13	12.491
2013	72.77	51	88	13	10.442
2014	71.38	46	89	13	13.556
2015	71.54	47	87	13	12.501
2016	72.31	53	87	13	10.363
2017	72.31	50	87	13	10.475
2018	72.85	54	88	13	10.566

Table B4 includes graduation statistics, indicating how many data points there were per model, the mean graduation rate, the number of data points, the minimum value, the maximum value, and the standard deviation. Table B5 displays the average graduation rate per institutions and Table B6 displays the average graduation rate per year. Regarding Table B4, v.1 refers to the time frame between 1993 and 2012, when the first performance funding model was in place, actual data available covers 1997 through 2012. In addition, v.N refers to the time frame between 2003 and 2012 when there was no performance funding model in place, v.2 refers to the second version of performance funding in Missouri, which covers data from 2014 through 2018.

Table B4

Summary Statistics on Graduation Data Between v.1, v.N, and v.2

	Mean	Minimum	Maximum	N	Std. Deviation
v.1 first pf model (1997-2002)	40.80	12.1	66.1	76	13.0541
v.N no pf model (2003-2013)	46.11	8.2	73.6	143	15.8742
v.2 second pf model (2014-2018)	46.28	5.6	74.9	65	18.1986

Table B5

Summary Statistics on Graduation Data Between Institutions

	Mean	Minimum	Maximum	N	Std. Deviation
Harris-Stowe State University	15.33	5.6	27.9	22	6.6743
Lincoln University	24.47	15.8	36.5	20	5.1370
Missouri Southern State University	32.63	28.1	37.1	22	2.4547
Missouri State University	49.67	36.6	55.4	22	6.4490
Missouri Western State University	30.17	25.2	36.5	22	2.9980
Northwest Missouri State University	49.30	39.6	56.2	22	4.6761
Southeast Missouri State University	47.80	36.5	52.1	22	3.7871
Truman State University	67.98	59.5	74.9	22	4.2828

University of Central Missouri	47.67	35.4	53.6	22	5.2631
University of Missouri-Columbia	66.53	57.5	70.8	22	3.8005
University of Missouri-Kansas City	44.59	36.6	52.2	22	4.4725
Missouri University of Science and Technology	61.09	51.6	67.2	22	4.4680
University of Missouri-St. Louis	42.40	31.2	55.6	22	6.7898

Table B6

Summary Statistics on Graduation Data Between Years

	Mean	Minimum	Maximum	N	Std. Deviation
1997	39.22	18.5	59.5	12	11.9850
1998	37.68	12.1	63.7	13	15.0912
1999	40.12	22.6	31.5	13	12.8019
2000	40.37	22.6	61.6	13	12.5260
2001	43.02	27.3	64.8	13	13.0988
2002	44.21	18.1	66.1	13	13.9746
2003	45.13	19.6	66.5	13	13.7962
2004	47.65	24.2	67.8	13	14.1141
2005	45.39	13.7	66.0	13	15.8530
2006	46.16	19.5	68.9	13	16.0993
2007	45.69	19.4	69.9	13	16.1517
2008	46.43	19.2	69.0	13	15.9425
2009	4559	20.8	70.8	13	16.4780
2010	46.07	13.3	69.8	13	17.3663
2011	45.30	8.5	68.9	13	18.6597
2012	46.62	8.2	73.6	13	18.3506
2013	47.18	10.4	71.7	13	17.3710
2014	47.08	8.3	70.5	13	17.5777
2015	45.24	6.9	72.8	13	19.1964
2016	46.28	5.6	71.8	13	19.0940
2017	46.36	7.0	74.9	13	19.9363
2018	46.45	9.3	71.9	13	18.0257

Research question 1. The purpose of this question is to examine the impact performance funding policy may have had on retention at four-year public institutions in the State of Missouri. Such impact is important to know since retention rates are an early indicator for degree completion and student success. The funding model is being used to predict the impact on retention rates:

R_1: Does performance funding policy have an impact on retention rates at Missouri's four-year public institutions between 2003 and 2018? (v.N, and v.2)

To start a Bartlett's test was run to see if an ANOVA can be run between the two groups since there is not an equal number of data points between the two models. The Bartlett's test determined that the variance between the two groups was too great to produce a result using an ANOVA test that would be valid. The Bartlett's test results, shown in Table B7, indicate a variance of 151.145 with a sample size of 143 for v.N. It also shows a variance of 125.697 with a sample size of 65 for v.2. The Chi-square value is 0.72518 and the P-value is above the threshold that would indicate significance (0.05) at 0.394, indicating no significance. This test concludes that there is no homogeneity of variance among the two groups and the results of an ANOVA would be invalid. The researcher found no significance on research question one.

Table B7

Research Question 1, Retention, Bartlett's Test Results

	Sample Size	Variance	Chi-square	P-value
v.N no pf model (2003-2013)	143	151.045	0.72518	0.394
v.2 second pf model (2014-2018)	65	125.697		

For the purpose of this dissertation in practice, the researcher ran both the ANOVA and ANCOVA. Although those results are invalid, going through the research steps are an important part of the practice. Table B8 shows the results of the ANOVA. The ANOVA shows no significance either with a value of 0.279, which is above the significance value of 0.05 needed. This invalid ANOVA test indicates that the null hypothesis on research question one remains.

Table B8

Research Question 1, Retention, ANOVA Test Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	168.890	1	168.890	1.180	.279
Within Groups	29493.091	206	143.170		
Total	29661.981	207			

Although also invalid based on the Bartlett's test results, the ANCOVA results are shown in Table B9. This model does show significance below the 0.05 threshold at 0.000. It is the selectivity that seems to be the best predictor for retention rates in this model. Looking at the year as a variable or the funding model as a variable, neither have significance below the 0.05, indicating they should be dropped from the model. Although the adjusted R squared = 0.730, it is driven by the selectivity of the institution. This result clearly states that the funding has minimal impact compared, and instead the performance on retention rates for the state is being driven by the selectivity of each institution. As mentioned earlier, this analysis is moot since there is too big of a variance between the two funding models and the retention rate.

Table B9

Research Question 1, Retention, ANCOVA Test Results

	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	21778.580[a]	3	7259.527	187.856	.000
Intercept	6.494	1	6.494	.168	.682
Selectivity	21597.659	1	21597.659	558.886	.000
Year	12.031	1	12.031	.331	.557
Model	24.310	1	24.310	.629	.429
Error	7883.400	204	38.644		
Total	1070536.000	208			
Corrected Total	29661.981	207			

a. R Squared = .734 (Adjusted R Squared = .730)

Research question 2. The purpose of this question is to examine if there is an impact on graduation rates based on the performance funding model being utilized at four-year public institutions in the State of Missouri. Such an impact would measure degree completion of additional students. The funding model is being used to predict the impact on retention rates:

R_2: Does performance funding policy have an impact on graduation rates at Missouri's four-year public institutions between 1997 and 2018? (v.1, v.N, and v.2)

To begin the research on the second question, a Bartlett's test was conducted to determine if there is a small enough variance between the three unequal groups, v.1 (the first performance funding model used between 1993 and 2002), the v.N (the period in which no performance funding model was used), and v.2 (the second performance funding model which started in 2014). For v.1 the data is available from 1997 through 2002, for v.N there is graduation rate data that covers 2003 through 2013, and for v.2 the data covers 2014 through 2018. Table B10 shows the results of the Bartlett's test. Unlike with the retention data, the variance between the three funding models is small enough

that it is significant and further research can be conducted using an ANOVA and ANCOVA.

Table B10

Research Question 2, Graduation, Bartlett's Test Results

	Sample Size	Variance	Chi-square	P-value
v.1 first pf model (1997-2002)	76	0.01704		
v.N no pf model (2003-2013)	143	0.02519	7.62982	0.022
v.2 second pf model (2014-2018)	65	0.03311		

There is a variance of 0.01704 with a sample size of 76 for v.1. It also shows a variance of 0.02519 with a sample size of 143 for v.N. Last the variance for v.2 is 0.3311 with a sample size of 65. The Chi-square value is 7.62982 and the P-value is less than the threshold that would indicate significance (0.05) at 0.022. This test concludes that there is homogeneity of variance among the three groups on graduation rates.

Table B11 shows the results of the ANOVA. The ANOVA shows significance at a value of 0.041, which is less than the significance value of 0.05 needed. This validates there is a significant difference between funding and the impact it has had on graduation rates.

Table B11

Research Question 2, Graduation, ANOVA Test Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1602.953	2	801.481	3.228	.041
Within Groups	69759.492	281	248.254		
Total	71362.455	283			

Next a Tukey post hoc analysis should show whether there is significance between all three funding models or not. Doing a Tukey post hoc analysis helps adjust for

the experiment-wise error rate. The experiment-wise error rate corrects for the fact that the more groups you have the more likely significance will occur. It calculates an adjusted significance value between each combination of groups (Field, 2017).

The results of the Tukey post hoc analysis are displayed in Table B12 and show that there is only a significant difference between the first performance funding model v.1 and the period in which no performance funding model was in place v.N. The difference in graduation rate between the two models is 5.3111%. This concludes there is a significant difference between the first performance funding model and the after the first performance funding model, when no performance funding model was in place. There was no significant impact from the second performance funding model that was started in 2014.

Table B12

Research Question 2, Graduation, Tukey Post Hoc ANOVA Test Results

Model 1	Model 2	Mean Difference (1-2)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
v.1	v.N	-5.3111%	2.2366%	0.48	-10.581%	-0.041%
v.1	v.2	-5.4811%	2.6619%	.100	-11.753%	0.791%
v.N	v.2	-0.1700%	2.3570%	.997	-5.723%	5.384%

This indicates that significance has been found regarding the second research question. The funding model seems to have an impact on graduation rates. More particularly, there's a 5.3% increase in the average graduation rate among the 13 public four-year institutions of higher education in Missouri from when the first model of performance funding existed to when the model was abandoned. There is no significance

in the 0.17% change that occurred when the second performance funding model was introduced.

Table B13 shows the ANCOVA results for the entire model, where once again the three funding models are used to see if there's a significant difference in graduation rates. This time the model has three control variables, the year associated with the graduation rate, the selectivity of the institution, and the size of the incoming cohort. Once again, the ANCOVA model used shows significance, with an adjusted R Squared of 0.798. All variables, except for the year, show significance. This means, from a statistical point of view, that the results of the analysis are validated, and the variables control for additional impact on graduation rates.

Table B13

Research Question 2, Graduation, ANCOVA Test Results

	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	57187.920[a]	5	11437.584	224.321	.000
Intercept	25.362	1	25.362	.497	.481
Year	27.715	1	27.715	.544	.462
Selectivity	31424.906	1	31424.906	616.325	.000
Cohort	8287.787	1	8287.787	162.545	.000
Model	723.036	2	361.518	7.090	.001
Error	14174.535	278	50.988		
Total	639528.362	284			
Corrected Total	71362.455	283			

a. R Squared = .801 (Adjusted R Squared = .798)

Correlation check: before discussing results, it is important to look if any of the covariates in the ANCOVA for graduation hold significant correlations. If the variables used as covariates corollate closely with the dependent variable it could impact the model and show significance where there is none based on the fixed factor. Table B14 shows the results from the correlation analysis between selectivity and graduation rates. With an R squared of 0.811 it accounts for a significant portion of the variability in graduation rates among the institutions at a significance level of 0.01. The selectivity variable should be removed from the ANCOVA. Table B15 shows that the year variable also shows significant correlation at 0.129. Year should also be dropped from the ANCOVA due to correlation with the dependent variable. Last, Table B16 shows that the cohort size variable also shows correlation at 0.588 with a significance level of 0.01. This indicates that the ANCOVA model is heavily correlated and should be dropped from the analysis.

Table B14

Research Question 2, Graduation, Correlation Selectivity, Test Results

		Selectivity	Graduation Rate
Selectivity	Pearson Correlation	1	.811**
	Sig. (2-tailed)		.000
	N	284	284
Graduation Rate	Pearson Correlation	.811**	1
	Sig. (2-tailed)	.000	
	N	284	284

*. Correlation is significant at the 0.01 level (2-tailed).

Table B15

Research Question 2, Graduation, Correlation Year, Test Results

		Year	Graduation Rate
Year	Pearson Correlation	1	.129*
	Sig. (2-tailed)		.030
	N	284	284
Graduation Rate	Pearson Correlation	.129*	1

	Sig. (2-tailed)	.030	
	N	284	284

*. Correlation is significant at the 0.05 level (2-tailed).

Table B16

Research Question 2, Graduation, Correlation Cohort Size, Test Results

		Cohort Size	Graduation Rate
Cohort Size	Pearson Correlation	1	.588**
	Sig. (2-tailed)		.000
	N	284	284
Graduation Rate	Pearson Correlation	.588**	1
	Sig. (2-tailed)	.000	
	N	284	284

*. Correlation is significant at the 0.01 level (2-tailed).

Discussion of Results and Future Work

Discussion of results

The null hypothesis for research question one is accepted, there is no measurable impact from performance funding on retention rates at Missouri's four-year public institutions between 2003 and 2018 using the data available. There is no significant difference between the performance funding model and retention rate at four-year public universities in Missouri. The null hypothesis for research question 2 was rejected, as there is a difference in graduation rates at Missouri's four-year public institutions between 199 and 2018. More specifically, the analysis shows that there was an increase in graduation rates after the first performance funding model was abandoned. This is most likely due to the nature of the data, as graduation rates utilize a six-year cohort model and are considered a lagging indicator. Cook and Pullaro (2010) have explained how the lagging nature of graduation rates make it an ineffective tool to measure student outcomes. It is possible this lagging nature of the graduation rate data lead to the full impact of the first performance funding model (v.1) not being evident until after the model was already abandoned. The result of analysis shows that the increase in graduation rates following the period of the first performance funding model was 5.31%.

The analysis also shows that there was no significant difference comparing the first performance funding model (v.1) to the second performance funding model (v.2). The same is true for comparing the second performance funding model (v.2) to the period when no performance funding model was in place (v.N) This means that graduation rates increased only after the first performance funding model (v.1) was abandoned, and since then there has not been a significant difference in graduation rates in Missouri. The

variation in sample sizes required the utilization of the Bartlett's test to ensure homogeneity of multi-variances (Field, 2017). According to Field (2017), this test makes sure the sample sizes, although not consistent, are similar enough for the analysis to be valid. The Bartlett's test did indicate the variance was normal for the graduation rate data among the three groups, but an analysis between only two groups was not conducted.

However, it is important to note that there was a 5.31% average increase in graduation rates among four-year public universities in Missouri after the introduction of performance funding. The lagging nature of the data may have led to a delayed acknowledgement of the results of the policy. This aligns with previous research from Burke and Modarresi (2000) who had seen early indicators of success in the first performance funding model (v.1). It would have been too early to look at graduation rate impacts at that time.

Future work

The researcher sees opportunity for additional research to be conducted in the future. There was no significance in the graduation rate data between the second performance funding model (v.2) and the other two funding methodologies (v1. and v.N). The size of the sample can certainly be the issue here and reproducing this study with additional future data once it becomes available is a recommended. In addition, it is possible to go back further and include additional data supplied by the 13 individual institutions for the first performance funding model (v.1) to add data for 1993 through 1996. The hope is this study will contribute to a future meta-study of performance funding models. In addition, building upon the research of Hillman, Tandberg, and Gross (2014), who argue providing a monetary incentive may make administrators wary of the program, future studies might provide a more in depth look at Missouri's second performance funding model (v.2) by seeing how the dollars received from the performance funding model impacted retention and graduation rates.

From the lens of the researcher's practice, it is important to note how lagging some of the metrics, such as graduation rate, can be in higher education. The hope is this study shows to the various stakeholders that results may not be available during the period in office. In Missouri, the legislature has term limits, limiting both house representatives and senators to two terms of four years. Since graduation rates at four-year publics take six years to calculate, even if a freshman representative introduced legislation in their first year, results would not be published until either year eight or the year after they leave office. In that scenario the assumption is also made that the freshman representative would be reelected. The researcher recommends that any future

model should strike a balance between short-term, mid-term, and long-term metrics. A metric that looks at how many students drop-out of college each term would provide more actional data for institutions of higher education to address in the short-term. Retention rates may be a mid-term metrics, taking a couple of years to see the impact from changes, and graduation rates could be used as long-term metric, taking seven to eight years to see results from actions taken.

Last, it will be important to look at sub sections of the population to avoid unintended consequences. Umbricht, et al. (2017) found that performance funding in Indiana did not lead to more graduates, but instead led to declining admission rates and increased admissions selectivity. This decline was disproportionately among low-income students and minority groups. The researcher recommends a future model include metrics on inputs, such as acceptance rates, and not just outcomes measures, such as degrees attained.

VITA

Egon Joseph Agnes Hubertus Heidendal was born in Heerlen, The Netherlands in 1983, he grew up in Margraten, The Netherlands, where lived until he was 20. He attended Maurice Rose elementary school in Margraten and graduated from Sophianum High School in Gulpen, The Netherlands. His undergraduate degree was in Communication and Multimedia Design, earned at Zuyd University, Heerlen, The Netherlands. Next, he moved to Maryville, Missouri, United States of America, where he completed a Master of Business Administration degree from Northwest Missouri State University.

After completion of his master's degree, he started his career at Northwest Missouri State University in 2009 as a Data Analyst. He has had various role at Northwest, including Senior Data Analyst, Director of Institutional Research and currently he is the Assistant Vice President of Institutional Research and Effectiveness. In addition, Egon has been an adjunct for Northwest Missouri State University. Awards include Excellence in Student Success and Recruiting Bearcats, 2019; and Joe Saupe Award: Best First-Time Presenter at MidAIR, 2015.

Egon has served on the Board of Director's of MidAIR, a regional institutional research organization. First from 2015 till 2017, and again starting in 2019. Currently he is the President of the Board of Directors of the organization. Egon has also been a member of the 2016 Leadership Missouri program organized by the Missouri Chamber.

Egon is married to Ann, Financial Assistance Counselor at Northwest Missouri State University. They were married in The Netherlands among friends and family. Egon enjoys Formula 1 racing, tailgating, and traveling.