

**Retention and Graduation Rates at Public Research Universities:  
Do Medical Centers Affect Rates?**

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## **Table of Contents**

Executive Summary .....	2
Introduction.....	3
Background.....	4
Literature Review.....	6
Research Design.....	12
Analysis and Findings.....	13
Discussion.....	19
Limitations .....	20
Conclusion and Recommendations.....	22
References.....	24

## Executive Summary

Retention and six-year graduation rates have increased in relevance and importance within the last decade. As costs for post-secondary education continue to rise, the need to graduate on time becomes more important to both the student and the institution. Public, four-year, research universities currently have a 63 percent six-year graduation rate over the past decade (U.S. Department of Education). An average 20 percent of the students entering these same institutions are leaving after their freshman year (U.S. Department of Education). Institutions across the United States have started prioritizing these measures of success.

The goal of this research study is to examine the amount that certain variables may affect student success in post-secondary education. The current issue facing institutions is how to increase first-year retention rates and continue to maintain the student enrollment until graduation. A variety of factors that are commonly associated with retention and graduation rates in the literature are included in the analysis. This study attempts to fill a gap in the literature concerning institutions with medical centers on campus. There are two research questions. 1) Does the existence of a medical center affect expenditure patterns? 2) Does a medical center on campus affect six-year graduation rates or retention rates either directly or indirectly?

This study included 137 four-year, public, research universities in the United States. Approximately half of the institutions have a medical center on campus. The panel data set is from the Integrated Postsecondary Education Data System (IPEDS) spanning the years 2008 to 2013. This study used a between effects regression analysis to estimate the effect of average levels of the cost of instruction on a variety of variables. I also completed both a between effects regression analysis and a fixed effects regression analysis to estimate the effects of average levels and changes, respectively, of retention and graduation rates.

The analysis shows that the existence of a medical center on campus affects expenditure patterns. Institutions with medical centers spend on average \$6,300 more on instruction per student. There were statistically significant results with percent of students admitted and student-faculty ratio as well. The greater amount the cost of instruction per student yields a lower student-faculty ratio.

The results show that there is no statistical evidence that medical centers affect six-year graduation rates or retention rates. Therefore, it is no more likely for a student to succeed if they attend an institution with a medical center on campus or an institution without a medical center on campus. Student success often relates to other factors of the university. Variables such as out-of-state cost, percent admitted, and ethnicity do impact retention and graduation rates.

## **Introduction**

The six-year graduation rate across four-year public research institutions averages 63 percent in the last decade (U.S. Department of Education). Why do more than one-third of the students who enter college either leave without a degree or require additional time to acquire it? Furthermore, an average 20 percent of the students entering a four-year public institution leave after their freshman year (U.S. Department of Education). Student retention and six-year graduation rates at the post-secondary level increased in relevance and importance in the past decade. Universities are striving to increase the first-year retention and six-year graduation rates. What methods or factors ensure that students are achieving and succeeding? Do certain features on campus, such as a medical center, support student success indirectly?

As costs for post-secondary education continue to rise, the need to graduate on time or to find something better to do becomes more important. Choosing an institution of higher education is challenging for high school students. If a student sees that a particular university or college possesses a particularly high graduation rate, the decision may become easier. Students are becoming increasingly savvy, and their desire to keep expenses low while receiving a quality education is growing. In turn, colleges and universities must work to increase the retention and graduation rates to become more attractive institutions to prospective students. Institutions also possess goals of excellence and high enrollment. These priorities vary by institution. The institution also benefits financially when a student enrolls and completes his or her education within six years without transferring or dropping out.

The goal of this research study is to examine the amount that certain variables may affect student success in post-secondary education. The current issue facing institutions is how to

increase first-year retention rates and continue to maintain the student enrollment until graduation.

## **Background**

The University of Kentucky prioritized retention and graduation rates in the 2009-2014 strategic plan. Provost Subbaswamy declared a “War on Attrition”. Several aspirations linked specifically to increasing student retention and six-year graduation rates. The objectives and targets aimed toward this goal. The strategic plan stated as Objective 1.2, “Improve student success, with particular attention to attrition and time-to-degree” (University of Kentucky, 2010).

The strategies outlined to achieve this goal were three-fold:

Strategy 1.2.1 Increase faculty numbers to improve student to faculty ratio and academic program quality; establish an academic staffing model based on national best practices with an optimal mix of teaching assistants and full-time faculty, including clinicians and lecturers.

Strategy 1.2.2 Continue and expand current programs aimed at improving undergraduate student success in the first two years (where attrition is highest), and implement a rigorous and on-going assessment of program effectiveness across curricular and co-curricular programs.

Strategy 1.2.3 Expand efforts to monitor student progress toward degree completion and implement a robust set of intervention and support strategies (University of Kentucky, 2010).

The University has implemented and continued to support a variety of student support programs aimed at decreasing the student attrition rate.

This trend continues across a variety of four-year, public, research institutions. The University of Arkansas developed a quality initiative proposal dedicated to increasing graduation rates from 2014-2017. The University invested in methods that have proven to assist in driving rates up for both retention and graduation. The administration invested in an advising and retention software program called Starfish. This program assists students in planning their

success path. It identifies at-risk students and connects them with services such as tutoring and mentoring. The program aids in keeping the students on track throughout their academic career. They also created a mandatory freshmen course, titled “University Perspectives: Destination Graduation”, designed to assist in the college transition process. An additional portion of the budget provided the departments with funding to increase faculty excellence and learning experiences for the students through tutoring. The final step in the process for the University of Arkansas included creating an Office of Retention and Graduation. The University’s office plans to model similar offices at the University of Oklahoma, Florida State University, and Florida International University. The Office will, “implement, monitor, and assess this initiative, will serve as a conduit of information about all activity on campus related to retention and graduation, will partner with ASG to sponsor a student committee on graduation, will share information on current research about retention and graduation, and will partner with the office of Institutional Research to provide and interpret data related to retention and graduation” (University of Arkansas, 2014).

The University of Texas at Austin took the process a step further and strived to increase four-year graduation rates. The University created a task force of faculty and students responsible for increasing the four-year graduation rate from 51% in June 2011 to 70% for the Fall 2012 full time-first time incoming freshmen (University of Texas at Austin, 2012). The methods used to increase the graduation rate compare to other institutions’ methods. The task force assigned to this project recommended enhancing the first-year and orientation experience through making changes to advising, staying involved in students’ first-year experiences to intervene as early as possible if necessary, and requiring that all first-year students live in on-campus housing. They also suggested creating a new administrative position titled a Champion

of Graduation Rates. This position ensured that the recommendations of the task force were being implemented successfully. It is yet to be seen how effective the task force will be as the students will not graduate until Spring 2016. This program demonstrates the lengths that institutions need to strive for in order to reach goals and that the process is not limited to six-year goals.

The experience of these three institutions only provides a glimpse at the emphasis that higher education places on the issue of retention and graduation rates. As previously mentioned, the topic continues to receive more attention and more support. The concern of retention rates and six-year graduation rates will not disappear soon. Universities should begin looking toward the research and other similar institutions in order to increase their own rates.

## **Literature Review**

Past research focuses primarily on two aspects contributing to student retention and graduation rates: characteristics of the students and characteristics of the institution. The student characteristics often pertain to scores obtained during the student's high school career. As one would speculate, high grade point averages and high standardized exam scores, such as the ACT and SAT, were associated with student success at the post-secondary level (Harackiewicz, Barron, Tauer, & Elliott, 2002). A study completed by Astin, Korn, and Green (1987) yielded results showing students who achieved a grade point average between 3.5 to 4.0 were seven times more likely to obtain their Bachelor's degree than their peers with lower grade point averages. The researchers also found that students with higher standardized test scores were more likely to graduate in four years (Astin, Korn, & Green, 1987).

The results pertaining to high achieving students are to be expected. The students included in this population are accustomed to putting in the effort necessary to succeed in the

classroom. Institutions with higher selectivity standards typically possess higher retention and graduation rates. The students that are being accepted possess the higher grade point averages and higher standardized test scores.

Institutions started creating and implementing preparatory programs for incoming full-time, first time students. Participating in the preparatory programs requires the student to move away from his or her hometown and live on campus prior to enrollment in college. The goal of this type of program is to aid student success. Programs like this are typically referred to as Summer Bridge Programs (Kezar, 2000). The Freshman Summer Program (FSP) at the University of Kentucky provides an example of this type of program. FSP is, “a six week residential enrichment program designed to orient first year students to academic and student life at UK” (University of Kentucky, 2015). They participate and experience the challenges associated with being away from family and friends and in a new environment prior to entering the classroom for the semester.

Past research supports the belief that students participating in such an experience are more likely to succeed and graduate on time (Sidle & McReynolds, 2009). It is to be expected that there is an increased likelihood for the student to have a more successful post-secondary academic career if they have participated in such a program (Barefoot, 1998). Many institutions implement courses that target challenges commonly faced by full-time, first-time incoming students. Examples of these courses were previously discussed at the University of Arkansas and University of Texas at Austin. The University of Kentucky created a course titled UK 101 that educates students on a variety of topics. These topics relate to the challenges that the student may face in their first year on a campus of higher education (University of Kentucky, 2014).

As would be expected when considering financial aid, the students who continued to receive aid in consecutive years were more likely to return and continue working towards their degree (Wohlgemuth,2007). The author completed a meta-analysis of 31 studies that examined financial aid in relation to retention and graduation. The results found, “financial aid to have a small, but significant, positive effect on student persistence, enabling lower-income students to persist at a rate roughly equal to that of middle- and upper-income students” (Wohlgemuth, 2007, p. 461). Therefore, lower income students could be less likely to succeed due to loss of funding at some point throughout their post-secondary education career. It should also be considered that financial aid is often contingent on performance. This raises the question that this is simply another method of measuring dedicated students.

Research examining institutional characteristics is limited in comparison to student characteristics. Institutional characteristics include selectivity, expenditures, and the value added to the student as a product of the University. Gansemer-Topf and Schuh (2006) address these three characteristics specifically because they believe the organizational behavior associated with each will have a greater impact and reach a wider range of students. Their study addressed four research questions:

1. Did institutional selectivity and the amount of money that was spent per student for instruction, academic support, student services, institutional support, and institutional grants significantly predict first-year retention rates and 6-year graduation rates?
2. For institutions with differing levels of institutional selectivity, did the amount of money spent per student on instruction, academic support, student services, institutional support, and institutional grants significantly predict first-year retention and 6-year graduation rates?
3. Did institutional selectivity and the percentage of institutional expenditures for instruction, academic support, student services, institutional support, and institutional grants significantly predict first-year retention and 6-year graduation rates?

4. For institutions with differing levels of institutional selectivity, did the percentage of institutional expenditures for instruction, academic support, student services, institutional support, and institutional grants predict first-year retention and 6-year graduation rates? (Gansemer-Topf & Shuch, 2006, p. 617).

Their research found that “institutional expenditures and institutional selectivity explained 58.8% of the variance in retention rates and 60.9% of the variance in graduation rates” (Gansemer-Topf & Shuch, 2006, p. 626). It is noted that financial aid would play a more critical role at a low-selectivity institution as they are more likely to enroll low-income students (Gansemer-Topf & Schuh, 2006). The research shows that the organizational behavior does affect retention and graduation rates. The data analysis from this research shows that high selectivity institutions spend on average almost twice as much on instruction, academic support student services, and institutional support. The average retention rate for high selectivity institutions is 85%, and the average retention rate for low selectivity institutions is 70%. The average graduation rate for high selectivity institutions is 71%, and the average graduation rate for low selectivity institutions is 47%.

Institutions engage in a variety of strategies to reach students and increase retention and graduation rates. The researchers state that most strategies are aimed at a particular group or population. The examples of some of the strategies provided include learning communities, residentially-based academic programs, undergraduate student–faculty research partnership, or service learning programs (Gansemer-Topf & Schuh, 2006). It is encouraging that at least two of the strategies provided have been implemented at the University of Kentucky and are commonly seen across other four-year, public institutions as well.

Veenstra (2009) takes a variety of student characteristics and addresses each through institutional characteristics such as student success programs. Her research offers a framework

for targeting student support activities. The student characteristics include academic achievement, family background, goals, and attitudes. She notes that some of the suggested processes for implementation will require funding. However, if the program costs are less than the amount lost due to a student leaving after his or her freshman year then the program is worth the expense (Veenstra, 2009). Her article includes the importance of institutional expenditures for the student, also addressed in Gansemer-Topf and Schuh's (2006) research.

The combination of student characteristics and institutional characteristics and how the two interact is also important to consider. The matter of student involvement or engagement both in and out of the classroom is becoming a crucial factor in student success (Upcraft, Gardner, & Barefoot, 2005). A survey used to assess this is the National Survey of Student Engagement. The survey defines student engagement through two aspects of quality. The first aspect is, "the amount of time and effort students put into their studies and other educationally purposeful activities." (NSSE-National Survey of Student Engagement, 2014). The second aspect is, "how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning." (NSSE-National Survey of Student Engagement, 2014).

In the United States and Canada, 1,574 institutions have administered the National Survey of Student Engagement since 2000 (NSSE-National Survey of Student Engagement, 2014). This survey gathers data on five categories of variables:

- (1) Participation in dozens of educationally purposeful activities,
- (2) Institutional requirements and the challenging nature of coursework,
- (3) Perceptions of the college environment,
- (4) Estimates of educational and personal growth since starting college, and
- (5) Background and demographic information (NSSE-National Survey of Student Engagement, 2014).

The data gathered through the National Survey of Student Engagement is used at the institution through “identifying aspects of the undergraduate experience inside and outside the classroom that can be improved through changes in policies and practices more consistent with good practices in undergraduate education.” (NSSE-National Survey of Student Engagement, 2014). Through participation in this survey, institutions are receiving suggestions on what is working well on their campus and what could be improved upon.

The effects of institutions having a medical center on campus versus those not having a medical center on campus in relation to retention and graduation rates have yet to be studied. This factor is important to consider. With no literature directly addressing this topic, it challenges one to think what the effects may be. Do the institutions with medical centers have a higher retention and graduation rate because they also enforce higher selectivity standards? Or, do the institutions have lower rates because a higher percentage of funding is directed to the medical center rather than to student support programs that directly target improving retention and graduation rates?

I hypothesize that the institutions with medical centers will have lower retention rates and lower six-year graduation rates due to an increased amount of funding being directed to the areas other than those intended to directly support students. The funding is not provided to departments in the university such as academic or student support programs. This research project will attempt to fill the gap in the literature and answer research questions associated with the topic.

## **Research Design**

There are two research questions:

RQ1: Does the existence of a medical center affect expenditure patterns?

RQ2: Does a medical center on campus affect six-year graduation rates or retention rates either directly or indirectly?

In an attempt to answer these questions, I gathered data from the Integrated Postsecondary Education Data System (IPEDS). I included four year, public institutions in the United States. I limited the scope further by narrowing to the institutions that were named Research Universities through the Carnegie Classification as of 2010. This code is updated every five years; therefore, some of the institutions were not classified as research universities in 2008. This search resulted in 146 institutions. Due to unreported data, the number of institutions decreased to 137. Of the 137 institutions included, 66 have a medical center on campus. The data originally dated from 2004-2013, however, after analysis, the years were limited to 2008 to 2013 due to missing, unreported data in the student-faculty ratio variable. A description of all variables included in the analysis is listed in Table 1. I chose these variables because they are commonly used in retention and graduation rate research in the literature. These variables were accessible through IPEDS as well.

**Table 1: Description of Variables.**

<b>Variable</b>	<b>Description</b>
<b>Medical Center</b>	Medical Center on campus of the public, four-year institution.
<b>Retention Rate – Full Time</b>	percent of the (fall full-time cohort from the prior year minus exclusions from the fall full-time cohort) that re-enrolled at the institution as either full- or part-time in the current year
<b>6Yr Graduation Rate - Total</b>	6-year graduation rate of the sub-cohort of full-time, first-time students seeking a bachelor’s or equivalent degree
<b>Cost of Instruction/ Student</b>	operating expenses associated with the colleges, schools, departments, and other instructional divisions of the institution and for departmental research and public service that are not separately budgeted.
<b>Percent Admitted</b>	Total percent of students admitted to the institution
<b>Admissions Yield – Total</b>	Percent of the enrolled students out of the number admitted
<b>Percent receiving any financial aid</b>	Percentage of all full-time, first-time degree/certificate-seeking undergraduate students who received any financial aid
<b>Cost for In-state Students</b>	Cost of attendance for full-time, first-time degree/certificate seeking in-state undergraduate students living on campus for academic year 2013-14.
<b>Cost for Out-of-State Students</b>	Cost of attendance for full-time, first-time degree/certificate seeking out-of-state undergraduate students living on campus for academic year 2013-14
<b>Student-Faculty Ratio</b>	Total FTE students not in graduate or professional programs divided by total FTE instructional staff not teaching in graduate or professional programs.
<b>Percent Black</b>	Percent of undergraduate students that are Black or African American in the fall of the academic year.
<b>Percent Hispanic</b>	Percent of undergraduate students that are Hispanic/Latino in the fall of the academic year.

## **Analysis and Findings**

Table 2 provides summary statistics for variables included in the analysis. The average cost of instruction per student among all 137 institutions is approximately \$19,000.

Approximately 66% of students that apply to the four-year, public, research institutions are admitted. Only 9% of the undergraduate students at the institution are Black/African American.

The Hispanic student population also comprises 9% of the undergraduate population.

**Table 2: Summary Statistics of Variables**

Variable	Mean	Standard Deviation
Cost of Instruction/Student	19053.06	35258.82
Percent Admitted	66.32	16.67
Admissions Yield	38.60	11.33
% Receiving financial aid	81.23	11.13
In-State Cost	22084.61	3976.67
Out-of-State Cost	35089.37	7494.82
Student-Faculty Ratio	18.4	3.4
% Black	9.0	10.23
% Hispanic	9.3	11.38

To estimate the effect of spending or anything else, including a medical center with the panel of universities, either a within effects regression model or a between effects regression model can be used. Fixed effects estimate the effect of changes in any particular factor, such as spending changes or acquiring a medical center. Between effects estimate the effect of average levels of any particular factor, such as average spending level or having a medical center over a period of years.

**Table 3: Between Effects Regression Analysis. Instruction Cost Per Student**

	Instruction Cost Per Student		
	Coefficient	Significance	Standard Error
Medical Center	6308.36	***	1021.401
Percent Admitted	-113.94	**	58.698
Admissions Yield	193.94		297.963
% Receiving financial aid	-95.05		58.698
In-State Cost	.558		.384
Out-of-State Cost	.037		.151
Student-Faculty Ratio	-987.189	***	194.382
% Black	-68.439		56.422
% Hispanic	-18.747		

Significance Level: \* =  $p < 0.10$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$

The analysis shows that the existence of a medical center on campus affects expenditure patterns. Institutions with medical centers spend on average \$6,300 more on instruction per student. A medical center likely requires additional educational equipment and technology. The effect of cost of instruction per student is net of all other variables. Student-faculty ratio is controlled, as are scholarships.

The median student-faculty ratio of universities is about 17. If that increased to 18, the cost of instruction per student would tend to be about \$1,000 less. If there were 30,000 students, this would mean a decrease from 1,760 to 1,670 faculty.

For every additional percent of applicants admitted, instruction spending per student tends to be \$114 lower. If you increase the applicants admitted by 10%, institutions tend to spend an additional \$1,140 less per student.

I used a fixed effects regression model to estimate the effect of changes in the various explanatory variables. The medical center along with each category of cost per full-time student, percent admitted, admissions yield, total cost for in-state students living on campus, total cost of out-of-state students living on campus, student-faculty ratio, percent of Black or African American enrollment, and the percent of Hispanic enrollment are explanatory variables. These variables are commonly used as predictors of retention and graduation rates in existing studies. These are the largest ethnic classifications apart from White, which is the base case.

I also completed a between effects regression analysis of the effects of average levels of various factors over time. The factors might or might not change very much; medical centers are rarely closed. This model controlled for all expenditure and tuition cost variables. These models were estimated using retention rates and graduation rates as dependent variables.

**Table 4: Fixed Effects Regression Analysis**

Note: Medical centers do not change in the data and thus are not in this regression. Only changes in explanatory variables are relevant in these models.

	Retention			Graduation		
	Coefficient	Significance	Standard Error	Coefficient	Significance	Standard Error
Medical Center						
Percent Admitted	-0.010		0.012	0.012		0.016
Admissions Yield	-0.03		0.031	0.062		0.04
% Receiving financial aid	0.030	**	0.014	0.023		0.019
In-State Cost	0.00001		0.0001	-0.0001		0.0001
Out-of-State Cost	-0.00001		0.0001	0.0003	***	0.0001
Student-Faculty Ratio	0.058		0.046	0.075		0.06
% Black	-0.397	***	0.081	-0.141		0.106
% Hispanic	0.107		0.067	0.247	***	0.088

Significance Level: \* =  $p < 0.10$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$

**Table 5: Between Effects Regression Analysis**

Average levels of the explanatory variables below are relevant in these models.

	Retention			Graduation		
	Coefficient	Significance	Standard Error	Coefficient	Significance	Standard Error
Medical Center	1.381		0.985	1.469		1.715
Percent Admitted	-0.201	***	0.033	-0.301	***	0.058
Admissions Yield	-0.306		0.273	-1.118	**	0.476
% receiving financial aid	-0.044		0.052	-0.109		0.091
In-state Cost	-0.0006		0.0003	-0.001	**	0.0006
Out-of-State Cost	0.0006	***	0.0001	0.001	***	0.0002
Student-Faculty Ratio	0.275		0.183	0.397		0.319
% Black	-0.144	***	0.048	-0.374	***	0.084
% Hispanic	-0.106	**	0.046	-0.261	***	0.081

Significance Level: \* =  $p < 0.10$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$

The fixed effects model exclusively uses changes in the explanatory variables. The medical center variable never changes over time. No university in my data opens or closes a medical center. Most of the variation in the dependent variable is explained by enduring characteristics of the universities in my data set, which indicates that it is difficult to change the retention and graduation rates except for in small amounts or over a long period of time. There is institutional inertia. The between effects regression model controls for levels of the variables or averages.

If you increase the amount of out-of-state tuition by \$1000, the retention rate will increase by 0.6%, and the six-year graduation rate will increase by 1%. If you accept 10% more

Black students, the retention rate will drop by approximately 1.5%, and the graduation rate will drop by almost 4%. Results are similar when you accept a greater number of Hispanic students.

## **Discussion**

Through the analysis, I answered the first research question, “Does the existence of a medical center affect expenditure patterns?” There is no evidence that the existence of a medical center on campus affects expenditures as a whole in any of the estimations. Various factors do affect the results, but not medical centers. The institutions with a medical center often spend a greater amount on instruction. I believe that there is a greater amount of equipment and technology needed to instruct medical students and to operate the medical center. It may also mean that the university as a whole possesses more extensive labs across campus. An increase cost of instruction may also mean that institutions with medical centers provide a more comprehensive variety of degree program options which tends to increase the amount spent. However, this spending has no effect on retention rates or six-year graduation rates. It does not affect spending for student support, academic support or scholarship cost.

Research question two was, “Does a medical center on campus affect six-year graduation rates or retention rates either directly or indirectly?” The results show that there is no statistical evidence for that. There is no evidence that the existence of a medical center is associated with graduation or retention rates. Therefore, it is no more likely for a student to succeed if they attend an institution with a medical center on campus or an institution without a medical center on campus. Student success is due to other factors.

It appears the most effective way to increase retention rates and six-year graduation rates is to become more selective when accepting incoming full-time, first-time students. Based on the results, this in turn leads to fewer accepted students from the state of Kentucky and thus might be

controversial. It is, however, clear that selectivity and serving a state may be difficult to manage at the same time.

It is also beneficial to the retention and graduation rates to accept out-of-state students. The variable in the model is out-of-state cost. I think that the students give the institution more consideration before attending due to expense, and therefore are more likely to stay and complete their undergraduate career. I would assume that if the students decide to leave their home state and attend an out-of-state institution then they are more likely to persevere and complete their education. It is also possible that the student is valuing their education at a higher cost, and the student perseveres due to the amount he or she is spending each semester.

Providing additional scholarship funding and financial aid will also help support students and therefore increase the likeliness of higher retention and six-year graduation rates based on other studies.

Overall, universities change very slowly. It is difficult to raise the retention and graduation rates for a particular institution. Any changes would require a great deal of time.

## **Limitations**

While this study yields interesting results, there are several limitations to it as well. This research study was limited to four-year public institutions that hold the Research University label from the 2010 Carnegie Classification. Including private institutions both with and without medical centers could yield different results. Data shows that prominent private institutions often possess higher retention and graduation rates due to increased selectivity and greater amounts of funding overall. It would also be interesting to examine public universities that hold a different Carnegie Classification coding. Those public universities that coded as Associate's Colleges, Master's Colleges and Universities, and Baccalaureate Colleges may yield different results.

These institutions will not add to the medical center research, but could supply further information on successful programs to aid retention and graduation.

A second limitation is the years included in the study. As noted, the importance of retention and six-year graduation rates has taken precedence in the last decade. Many higher education institutions included this issue or created a plan to address this issue within the last five years. This does not provide the time needed to examine the potential impact of newer programs targeted at the retention and graduation issue. Several studies should be completed in the next decade in order to see the effect of the newly implemented programs targeted at retention and graduation rates.

An additional limitation to the study is the broad overview that was used to examine the institutions. Some institutions that include a medical center on the campus did not have expenditures listed for the cost of hospital services. It could be beneficial to the research to examine institutions more closely. Delving into the detailed expenses of a university may yield some further insight on the effects of medical centers on retention and graduation rates at four-year, public, research universities.

The budget and funding provided to institutions from the government over the last decade has decreased. Although this is not a limitation, moving forward, it would be interesting to examine how the universities respond to the budget cuts and how the cuts may affect retention and graduation rates. Less funding to the university as a whole may result in less funding toward supplemental programs. Research shows that a variety of the students support programs assisted in increasing retention and graduation rates. Will the rates decrease if there is no funding available to sustain these programs? Methods to maintain the support programs and continue to increase the retention and six-year graduation rates without the desired funding may be needed.

## **Conclusion and Recommendations**

In conclusion, I do not find any evidence that medical centers on campus of four-year, public research institutions affect retention rates or six-year graduation rates. There are a number of options available to institutions to target improvement concerning these two rates.

The data from this research study supports that one of the best way to increase retention and graduation rates at higher education institutions is to accept a greater number of out-of-state students. However, this does not support the purpose of land grant institutions in the state, such as the University of Kentucky. If the University accepts fewer in-state students, it is no longer supporting its home state students. It is possible that the home state is supported if the out-of-state students stay in Kentucky after finishing their degree and contribute to the Commonwealth. The University cannot accept students from one area and maintain a high quality of retention rates and six-year graduation rates. I recommend that the University maintains its current rate of acceptance for in-state students and also directs a greater amount of funding to student support programs. The programs will assist the students in the areas that are most needed.

The data also shows that enrolling minority students is currently decreasing the retention and graduation rates. Implementing programs that assist minority students in their education may change the current trend. The literature pointed to programs that aid in the college transition to students. I believe it is important to ensure that all students are receiving the required support essential to success. Providing these programs will hopefully turn the issue around and the impact of minority students on retention and graduation rates will no longer exist.

Overall, I would advise a four-year, public, research institution to become more selective in order to increase retention and graduation rates. There may be other options to consider, but these options would require a long period of time. Universities are relatively predictable over a

period of time, and they change very slowly. The topic of retention and six-year graduation rates and its importance will not disappear. Institutions continue to face higher standards. Many programs and policies are being implemented and will continue to be created. Funding will be required to create and support the necessary programs that aid in student success.

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