

**Measuring Effectiveness in Alabama's Community Colleges  
as a Function of institutional Expenditures**

by

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## Abstract

With state resources for higher education under constant pressure, it is critical to understand how to maximize institutional performance while being economical with resource allocation. Future workforce demands will call for an increasing number of those entering the workforce to have some form of higher education instruction, beyond their primary education. In particular, community colleges will almost certainly play a central role in this process.

This study explored the relationship between institutional expenditures in Alabama's community colleges and several outcomes: graduation rates, retention rates, and the number of certificates granted between one and two years and less than one year. Data were gathered from the Integrated Postsecondary Education Data System (IPEDS) and examined with stepwise multiple regression analysis in SPSS.

Results of this study indicated that several of the institutional expenditures analyzed were predictive of outcomes in Alabama's community colleges. In particular, this research indicated institutional support expenditures were predictive of graduation rates, student services expenditures were predictive of certificates granted between one and two years in duration for completion and, instructional support expenditures were predictive of certificates granted of less than one year in duration for completion.

The aim of this research was to provide original analysis of community college expenditures in Alabama in relation to various outcomes in order to provide pertinent material for stakeholders and policymakers.

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## CHAPTER 1: INTRODUCTION

The current economic climate of higher education in the United States does bear remarkable similarity to the financial collapse of 2008, when subprime mortgages bid up an entire sector of the economy before collapsing. Increased interest and investment boost the price of an asset class (in this case, a degree), with the idea that ultimately, the return on investment will be worth the expenditure to get there (Wood, 2011).

Abel, Deitz and Su (2014) noted that, by historical standards, unemployment for recent college graduates is quite high. American higher education must take measured strides to enhance either the graduates they are producing or the process by which graduation is achieved. By focusing on the latter, policymakers and institutions alike will need to continually revisit ways to streamline the process.

With a diminishing prospectus for employment, market principles would dictate demand for a degree should drop. Agresto (2011) postulates such a notion is simply untrue: American society stands opposed to any view that shortchanges money being placed into education. The author also claims American society has placed an exceptional belief in American higher education degrees for which there is no alternative.

However, the negative information surrounding the waning value of a higher education degree, combined with student debt might guide a student considering college to take an alternative route, which could include forgoing pursuing a higher education degree or certificate altogether. Nevertheless studies clearly demonstrate that lifetime earnings are far greater for those with a postsecondary degree. Herhshbein and Kearney's (2014) study, *Major Decisions:*

What Graduates Earn Over Their Lifetimes, a collaboration between the Hamilton Project and the Brookings Institution, produced data showing differences in career earnings by college major. At the bottom of the list was a thin bar associated with those who have only a high school degree or its equivalent. The associated graph is below:

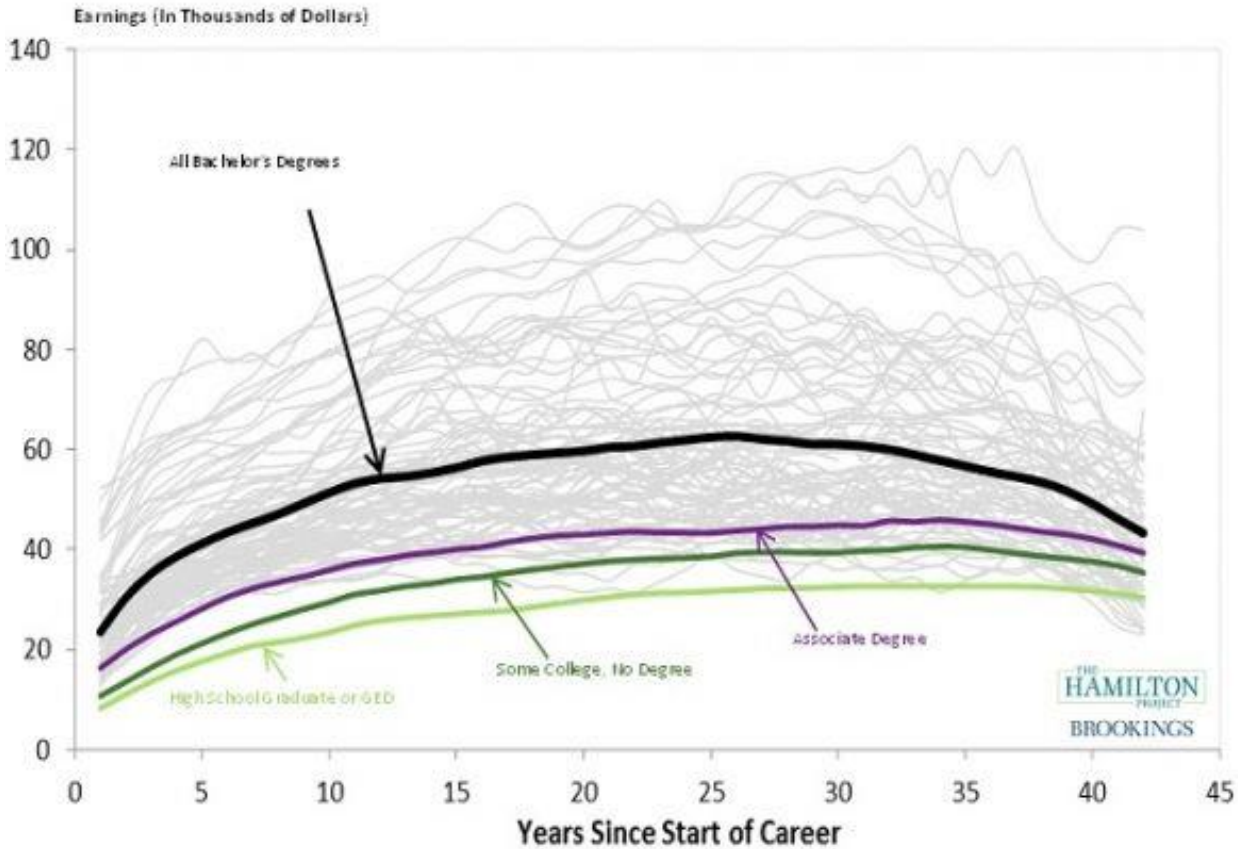


Figure 1: Earnings potential vs. educational attainment

The career outlooks for those without higher education experience is not promising. Some type of postsecondary education is surely advisable for long-term quality of life. Perhaps the answer lies in the middle for those students who do not wish to attend a four-year institution of higher education. The community college system is a viable option – especially in an environment populated by economic naysayers (Hershbein & Kearney, 2014).

Myran & Ivery (2013) contend that attending a vocational institution or community college is essential to the workforce development process in the United States. Indeed, community colleges answer an increasingly critical need. The United States Department of Education (2006) advised, “90% of the fastest growing jobs in the new knowledge driven economy will require some form of postsecondary education in the form of an associate degree, certificate, or license” (p. 1) The importance of the community college for the future of both the American economy and higher education system cannot be overstated.

Accelerate Alabama (2012) was an innovative economic development plan that outlined the southern state’s economic capacity and served as a roadmap for where the state should be focusing its industrial efforts. In the report, which garnered input from more than 1,200 stakeholders, the advanced manufacturing sector is cited as Alabama’s top employer, accounting for 16.4% of the state’s jobs. The plan specifically mentions the vital necessity of the state’s two-year college system in the development of an educated workforce.

Although the future of education and industry in the state of Alabama and the country at-large cannot be precisely predicted, what is clear is the need for an educated workforce and the opportunities some type of college education affords those who receive it (Hershbein & Kearney 2014). Understanding how these colleges perform at the state level relative to the amount of money they spend should be a critical part of the decision making process when policymakers and educators chart their course.

### **Problem statement**

There is a need to explore the relationship between institutional performance and various institutional expenditures for the State of Alabama’s community colleges in order to find the best fit for institutional expenditures relative to student performance. Where colleges choose to spend

their money should be related to where they receive the most value. Abouzeida's (2014) study used first-year retention and six-year graduation rates as a metric for assessing institutional performance. Since community colleges represent an entirely different type of institution for analysis, different, but similar metrics were used.

### **Purpose of the study**

This study is intended to satisfy one of the limitations of academic research while at the same time provide an enhanced understanding of the correlation between institutional spending and performance for Alabama's community colleges. Specifically, the study furthers academic research on community college expenditures and its relation to student outcomes in a specific environment: one state. To assess performance, graduation rate, certificates awarded, and full-time retention rates were used. The expenditures used included an agglomeration of instruction, academic support, student services and institutional support expenditures.

The purpose of this study was to analyze Alabama's community colleges for relationships between expenditures and performance indicators. The subsequent questions sought to reveal potential relationships while adding a new layer of literature to Abouzeida's (2014) research. An additional indicator – certificates granted – was added for this study. The number of certified graduates available is a critical component of Alabama's economy and demonstrates a key measure of a workforce that is ready to meet the state's needs.

It is important to note that not all of the institutional expenditure data used in Abouzeida's study are available for the two-year colleges in Alabama. Specifically, research expenditures and public services expenditures were not analyzed in this study due to lack of availability.

### **Research questions**

The following research questions were used in this study:

1. Which combination, if any, of expenditure components per FTE student best predict total cohort graduation rates in Alabama's community colleges?
2. Which combination, if any, of expenditure components per FTE student best predict retention rates in Alabama's community colleges?
3. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of 1 but less than 2-years?
4. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of less than 1 year?

### **Significance of the study**

Alabama's 2015 legislative session had a revolutionary impact on its community college system. Before being changed, the 26 two-year institutions in the state were governed by the Alabama State Board of Education, an elected body of eight members. However, in 2015, Alabama law was altered and a new Board of Trustees for the community college system was created. The new board relieved the State Board of Education from its long-held control of the state's community colleges.

With economic development at the forefront of current Governor Kay Ivey's continuing agenda, Alabama is positioned to realize efficiencies and make gains in its community college system that were previously unimaginable. The importance of understanding how institutional expenditures correlate to performance in a state where community colleges are needed to help supply an educated and ready workforce cannot be overstated.

With a growing economy to feed, the state cannot afford to see its community colleges fail to produce an educated workforce as a result of budget disagreements in the state's legislature. Determining what institutional expenditures correlate to institutional performance could help discover new efficiencies and serve as a roadmap to begin conversations about ways to maximize the educational opportunities in Alabama's community colleges.

### **Conceptual framework**

Astin's (1991) input-environment outcome framework serves as the starting point for the foundation of this study. Critically, his recommendation for analysis points out that inputs and outputs alone offer us little collective understanding. Rather, when analyzed together, they can begin to apprise us of why a certain relationship or correlation exists. Additionally, his approach to higher education assessment requires environment be used as part of the construct.

According to Astin, outcomes are what our educational institutions should be producing; he uses the word talents when describing the product(s). Inputs include specific attributes the students themselves bring to the table. Finally, environment includes those things which are controlled by either the teacher or the institution that impact the student. Astin theorizes that when combined, these three factors can help in understanding what structures can augment the final product institutions of education are producing.

This study, while not aligning exactly to the Astin input-environmental outcome model, does use the framework as a launching point. Analyzing the student outcomes of Alabama's Community College System and their association with institutional input and environment – both of which are factors influenced by expenditures – will give us a better understanding of which particular inputs have an impact on the product produced.

### **Definition of terms**

The terms used in this study are defined below. Data used were gathered from the Integrated Postsecondary Data System (IPEDS), a database under the authority of the National Center for Education Statistics (NCES). These definitions below are from the IPEDS database.

- Academic support expenditures: A functional expense category that includes expenses of activities and services that support the institution's primary missions of instruction, research, and public service. It includes the retention, preservation, and display of educational materials (for example, libraries, museums, and galleries); organized activities that provide support services to the academic functions of the institution (such as a demonstration school associated with a college of education or veterinary and dental clinics if their primary purpose is to support the instructional program); media such as audiovisual services; academic administration (including academic deans but not department chairpersons); and formally organized and separately budgeted academic personnel development and course and curriculum development expenses. Also included are information technology expenses related to academic support activities; if an institution does not separately budget and expense information technology resources, the costs associated with the three primary programs will be applied to this function and the remainder to institutional support. Institutions include actual or allocated costs for operation and maintenance of plant, interest, and depreciation (NCES).
- Certificate: A formal award certifying the satisfactory completion of a postsecondary education program. In this study, two types of certificates were studied, those whose completion takes between one and two years and those whose completion takes less than one year. Both are categorized the way in the IPEDS database, as certificates of less than two years. That definition is as follows: Programs requiring less than 2 years of full-time

equivalent college level work (4 semesters or 6 quarters) or less than 1,800 contact hours to obtain a degree, diploma, certificate, or other formal award. (IPEDS Glossary of Terms)

- Expenditure components: Agglomeration of instruction, academic support, student services and institutional support expenditures.
- Full-time equivalent of students (FTE): The full-time equivalent (FTE) of students is a single value providing a meaningful combination of full-time and part-time students. The number of FTE students is calculated based on fall student headcounts as reported by the institution (NCES).
- Institutional support expenditures: A functional expense category that includes expenses for the day-to-day operational support of the institution. Includes expenses for general administrative services, central executive-level activities concerned with management and long-range planning, legal and fiscal operations, space management, employee personnel and records, logistical services such as purchasing and printing, and public relations and development. Also includes information technology expenses related to institutional support activities. If an institution does not separately budget and expense information technology resources, the IT costs associated with student services and operation and maintenance of plant will also be applied to this function (NCES).
- Instruction expenditures: A functional expense category that includes expenses of the colleges, schools, departments, and other instructional divisions of the institution and expenses for departmental research and public service that are not separately budgeted. Includes general academic instruction, occupational and vocational instruction, community education, preparatory and adult basic education, and regular, special, and extension sessions. Also includes expenses for both credit and non-credit activities. Excludes expenses for



academic administration where the primary function is administration (e.g., academic deans). Information technology expenses related to instructional activities if the institution separately budgets and expenses information technology resources are included (otherwise these expenses are included in academic support). Institutions include actual or allocated costs for operation and maintenance of plant, interest, and depreciation (NCES).

- Retention rate: A measure of the rate at which students persist in their educational program at an institution, expressed as a percentage. For four-year institutions, this is the percentage of first-time bachelors (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled in the current fall. For all other institutions, this is the percentage of first-time degree/certificate-seeking students from the previous fall who either re-enrolled or successfully completed their program by the current fall (NCES).
- Student services expenditures: A functional expense category that includes expenses for admissions, registrar activities, and activities whose primary purpose is to contribute to students emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. Examples include student activities, cultural events, student newspapers, intramural athletics, student organizations, supplemental instruction outside the normal administration, and student records. Intercollegiate athletics and student health services may also be included except when operated as self-supporting auxiliary enterprises. These expenditures also may include information technology expenses related to student service activities if the institution separately budgets and expenses information technology resources (otherwise these expenses are included in institutional support.) Institutions include actual or allocated costs for operation and maintenance of plant, interest, and depreciation (NCES).

- Total cohort graduation rate: Graduation rate of first-time, full-time degree or certificate seeking students.

### **Assumptions**

The data utilized in this study were derived from the Integrated Postsecondary Education Data System. This study assumes the data therein were accurate.

### **Limitations**

The researcher is wholly aware of the relatively small sample size used for this study. A sample size of 26 institutions presents a unique perspective, but also an imperfect vision for the entirety of a region, or further yet, country. It is important to know what is going on at both the macro and micro level in any research. This particular study was granular and sought to study the state of Alabama and its community college system. Additionally, some schools had data that were incomplete or not fully reported to IPEDS.

### **Summary**

This study aims to provide valuable information regarding community college expenditures and performance at a time when resources are shrinking and maximizing education is pertinent. Given the importance of advanced manufacturing to Alabama's economy and the growing and forecasted need for some level of postsecondary education, this study is timely. Subsequent chapters will present a review of literature related to this research (Chapter 2), outline the particular methods utilized by the researcher (Chapter 3), present results (Chapter 4), and discuss conclusions and implications (Chapter 5).

## CHAPTER 2: REVIEW OF LITERATURE

### **Overview of literature**

Cohen and Kiskar (2010) acknowledge that outcomes in higher education are increasingly focused on the production of a trained population that possesses an increased ability to move between social strata. Cohen would also suggest the addition of another nuance – a workforce that is not just mobile, but is one that contributes greatly to society.

In his presentation to the Metropolitan Club of New York, Richard Eckman, president of the Council of Independent Colleges notes that the attributes of a college student in our modern era are a moving target – and are increasingly diverse (Speech, October 7, 2013). Additionally, he admits there exists a dwindling environment for investment return amid uncertain economic times – especially for colleges with endowments. It is this environment that bears down on the infrastructure of today’s American higher education. Endowment growth was rocked by the advent of the great recession (Blumenstyk, 2010).

While the markets took their toll on traditional four year institutions that saw their return on investment disintegrate, their partners in the higher education realm, community colleges, saw their enrollments tick up. Workers who lost their jobs as a result of the financial collapse were faced with dwindling options and often chose to retool their marketability to employers by advancing their educational history. Many opted to do this through the community college system (Felix & Pope, 2010).

Employability skills are absolutely critical. In its 2012 report, *Reclaiming the American Dream: Community Colleges and the Nation’s Future*, the 21<sup>st</sup>-Century Commission on the

Future of Community Colleges noted that “nearly two thirds of all American jobs will require a postsecondary certificate or degree by 2018” (p. viii). Furthermore, in the same report, the study notes the troubling position American education finds itself in with regards to completion rates. The United States once led the world in the degree completion for students aged 25-34 years old; at the time of the study’s (2012) publication, however, the United States ranked 16<sup>th</sup> in the world for the same metric.

In order to answer the call of today’s employers while maintaining institutional effectiveness, community colleges must be able to quickly respond and adapt to changing environments and scenarios. McClenney (2013) notes that while innovation is uncomplicated, transformation is “horrendously difficult,” for a variety of reasons (p. 28). Community colleges cannot shy away from transformation, if necessary, in order to keep up with the pace demanded.

### **Purpose of the study**

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### **Community college in the United States and Alabama**

Cohen and Kiskar's (2010) account of the transformative era of higher education offers a great starting point for understanding the growth of college in the United States. Between the years of 1870-1944, higher learning opportunities expanded with vigor. The Civil War's end marked the beginning of increased industrial and geographic expansion that would ultimately be accompanied by an expansion in higher education as well. During this period student enrollment grew by over a million, while faculty enrollment grew by over one hundred thousand (p.97).

In order to better understand the community college of today, its genealogy must be traced back to the beginning of Cohen and Kiskar's transformative era, when higher education garnered robust federal support through the Morrill Act of 1862. George Vaughn (1985) characterized the expansion as one that broadened the base of higher education, and taught students subjects previously excluded from higher education. It should be noted that Vaughn (1985) pays homage to the early colonial institutions by noting the subjects they taught were not common or necessarily practical.

The early colleges were based largely on European models and revolved around strict academic curriculum – often heavily tied to the prevailing religious sentiment of the day. Those subjects not tied to religion included the study of “classical writers... liberal arts and natural science” (Cohen & Kiskar 2010, p. 15). The Morrill Act of 1862 donated lands to states so that they might enter the higher education world through the creation of land-grant institutions. The purpose of these institutions, according to the act itself, was to begin incorporating studies in the fields of agriculture and mechanic arts. Noted with importance is language that highlights the Act's desire to promote the “liberal and practical education of the industrial classes in the several pursuits and professions in life” (Morrill Act of 1862). The Morrill Act represents a critical mark in education history as it begins to introduce the idea of a college accessible to the people that also taught practically (Vaughn, 1985).

The idea of accessible postsecondary education makes up the very roots of community college existence in the United States. Characterized as a uniquely American creation, early community colleges were remarkably focused on the communities in which they were located (Thelin, 2011). One of the early drivers of their existence was an increased amount of high school graduates who desired a way to continue their education without travelling to enroll in a

baccalaureate degree granting institution (Cohen & Kiskar 2010). Community colleges served their communities by giving these high school graduates a way to complete their first two years of higher education at home – in their communities – before transferring to another institution to complete their studies.

The explosion of geographical and industrial expansion (Cohen & Kiskar, 2010), combined with acts of congress (e.g. The Morrill Act of 1862) created an opportunity for average Americans to access something that was steeped in inaccessible traditional academia (Cohen & Kiskar, 2010) in order to provide a better quality of life through practical education (Vaughn, 1985).

The concept of accessibility is one of the more important distinctions of a community college. In fact, in a marked response to the restrictive admissions policies of some baccalaureate degree granting institutions, the community college serves most anyone through open enrollment (Lane, 2003). The Truman Commission of 1947 hastened the call for this open access. Gilbert and Heller (2013) present the commission report as one that “created, arguably for the first time, a national rhetoric on higher education policy” (p. 417). Indeed, one of the goals was to double college attendance in just thirteen years. In order to attain such an ambitious undertaking, one of the commission’s recommendations was to increase the role of community colleges in American higher education.

With increased enrollment came differing expectations. Due to the amorphous nature of their existence, it can be difficult for community colleges to determine whom they are serving and for what purpose (Lane, 2003). Certainly there is an opportunity to allow students a chance to complete two years of education before transferring to a four-year institution. There is also opportunity for an enrollee to take up a program where the end result is an associate’s degree and

potential employment that comes with it. Further, there are some who might choose to enter into a certificate granting program in order to seek immediate and applicable job based skills (Lane, 2003). The baccalaureate granting institutions during the time of the Truman Commission were amenable to community colleges serving students who sought only an associates degree or vocational education, but were more apprehensive about the role of the community college in liberal arts instruction. In fact, there were calls for the community colleges to be subsumed into each state's university system and to show deference first to the needs of the baccalaureate granting institutions therein (Thelin, 2011).

Although there was tension between community colleges and their baccalaureate granting peers, history shows that, in fact, some four-year institutions appreciated the open enrollment policy of community colleges as it allowed them to retain their restrictive admissions policies and forgo the burdensome and sprawling process of freshman admissions (Cohen, 2010).

### **Alabama community college history**

In 1925, the first community college – a state run trade school – opened. Some forty years later, after the call for expansion as outlined in the Truman Commission, the Alabama Legislature gave the State Board of Education authority over the two-year colleges extant in the state. In 1982, the legislature created the Alabama Department of Postsecondary Education, giving the State's two year colleges a separation from the Alabama State Department of Education while creating a position of leadership through the establishment of a new position – Chancellor of the Alabama Community College System.

In 2015, the Alabama State Legislature passed legislation removing the state's community colleges from the State Board of Education's oversight by giving the Department of



Postsecondary Education its own board of trustees. Following the creation of the new board, the department renamed itself the Alabama Community College System.

The system's stated mission is "To provide a unified system of institutions dedicated to excellence in delivering academic education, adult education and workforce development". A student enrolled in the Alabama Community College System can find opportunity to transfer to a baccalaureate degree granting institution, earn an associates degree or any number of credentials with workforce value.

Currently, the Alabama Community College System is comprised of 26 institutions. While the institutional profile of each institution is different, each serves a unique body of students and will be analyzed in this research. In alphabetical order, the institutions are:

- Alabama Southern
- Bevill State
- Bishop State
- Calhoun
- Central Alabama
- Chattahoochee Valley
- Drake State
- Enterprise State
- Faulkner State
- Gadsden State
- Ingram
- Jeff Davis
- Jefferson State
- Lawson State
- Lurleen B. Wallace
- Northeast Alabama
- Northwest Shoals
- Reid State
- Shelton State
- Snead State
- Southern Union
- Trenholm State
- Wallace – Dothan
- Wallace – Hanceville
- Wallace – Selma
- Marion Military

## **Funding community colleges in 2018: Accountability, performance based funding**

Community colleges are not immune to challenges in state budgets. In fact, they are reliant upon state funding. According to Zeidenberg (2008), community colleges have few places to look for funding; those places include local property taxes, state allocation and tuition and fees from enrollees. It is important to note that state funding is never without waver – periods of economic stagnation are sure to impart some fiscal damage. Hannover Research’s 2013 report, *Planning for the Future in Community Colleges* presents three key findings and goals for community colleges in the current and future landscape:

1. Community colleges are seeking new sources of funding
2. Collecting and analyzing data effectively are increasingly essential
3. In the interest of increasing student success, community colleges are strengthening partnerships (p. 3)

Significantly, all three findings are in some way related to funding. The first finding, as accentuated by Zeidenberg above, reinforces the need for community colleges to be wary of state budget constraints by aggressively seeking new sources of funding. Finding two is important as higher education in general – not just community colleges – must be able to answer to the increasing calls for performance based funding models in higher education (Fain, 2014). Finding three is not all that dissimilar from the first finding – new partnerships could locate new money.

A survey of college presidents in early 2014 indicated that although the deep and immediate gashes of the 2008 great recession are over, presidents did not have a confident outlook for their economic future. According to Dowd and Shieh (2014), there are concerns that the fiscal situation in some states may be changing the very character of the community college system. As Zeidenberg (2008) notes, since the income stream for a community college is

relatively limited, they have relatively few options for staying afloat during difficult times. In other words, unlike at four-year state institutions, community colleges cannot rely nearly as heavily on philanthropic giving to help cover funding shortfalls.

One option to gain protection from diminishing state funding could come through increased tuition. How this hurts enrollment is not fully known: Dowd and Shieh (2014) speculate the full impact of an increase in tuition on enrollment is uncertain because a significant amount of tuition is subsidized and therefore not necessarily out of pocket. The biggest concern with increasing tuition to offset state cuts would certainly be a declining enrollment, even if research shows no obvious direct link.

Some note that in response to budget constraints, higher education institutions in general are not adept at making good choices. Ehrenberg (2002) notes that unlike a corporate enterprise where bottom lines can be increased through significant changes – like packing up and moving to a new location, colleges must utilize different means to see cost reduction. Ehrenberg goes further by chiding institutions for not acting prudently. Increased spending can lead to increased quality, but the author points out that they could also be realized through efficiency, cost cutting and reallocation (Ehrenberg, 2002).

In order to make efficient choices in times of uncertain funding, it is imperative that community colleges move towards more data based decision-making. The idea of performance based funding in higher education is not new. In fact the early reputational studies of universities in the 1930s were created to bring forth some way to measure university quality. Although the sample pool was small and generally relied on the opinions of those within PhD granting departments, it is a notable benchmark in the concept of evaluating a university for quality (Brooks, 2005).

The more modern focus on accountability (and not perception of those within) began to bloom in the 1990s. According to Shin (2009), these new efforts were developed to enhance institutional autonomy and performance by focusing more on the output of a college or university than on the input. The incentive based model for modern performance based funding seeks to influence university decision-making or behavior by tying its outcomes to the funding it receives (Nisar, 2015). The current budgetary constraints outlined above leave institutions little choice but to respond when the calls for accountability arrive.

Performance based funding (PBF) is not a new phenomenon. Thornton and Friedel (2016) note that PBF was introduced by the Tennessee Higher Education Commission in 1978. The extent and reach of programs vary by state and should be tailored to state-specific needs. Indeed, when “designed with stakeholder input and mission differentiation, PBF offers several possible benefits. Emphasizing the state’s education and workforce goals through the funding model allows for further alignment of public institutional missions with the state’s goals” (Friedal & Thornton, 2016, p. 190 ).

Performance based funding, in its traditional sense (referred to as 1.0), rewarded institutions of higher learning with an amount of monetary compensation that was in addition to their normal state-funded appropriations. The amount of additional compensation was determined by certain outcome metrics that factors such as graduation rates, retention statistics, and employment after graduation. Importantly, performance based funding seeks to reward colleges and universities based on actual outcomes, not simply because they increase enrollment (Gross, Hillman & Tandberg, 2014; Dougherty & Reddy, 2011). The later and most recent iteration of performance based funding (referred to as 2.0) strives to take into account other aspects of the collegiate experience that are not necessarily limited to the outcomes listed above.

Dougherty and Reddy (2011) note that these 2.0 programs put “considerable emphasis on indicators of intermediate achievement” (p.6). In other words, analyzing metrics that were not the final product of a student’s body of work. Course completions or other student achievement benchmarks are measured by performance based funding 2.0. Notably, the newer model does not neglect or ignore the outcomes measured by its predecessor – it simply creates a more complete picture.

Perhaps the most important distinction between the two variants of PBF, according to Dougherty and Reddy, however, is the actual transfer of resources from the state to the institutions. Whereas performance based funding 1.0 allocated money above and beyond typical appropriation in exchange for optimized performance, performance based funding 2.0 bakes the appropriations into the formula that determines the amount of state aid institutions receive. (Dougherty & Reddy, 2011).

Although the idea behind performance based funding is a top down incentive system designed by policymakers to squeeze better performance out of institutions of higher education (Dougherty & Reddy 2011), there are mixed opinions as to whether or not it is effective in achieving its goal. By holding the monetary purse strings, policymakers believe they can drive change. Indeed, PBF represents a fundamental shift in how colleges are evaluated. Instead of measuring inputs, the PBF model measures outcomes. Tandberg and Hillman and Gross (2014) analyzed the effects of performance based funding on 25 state community colleges and found little correlation between degree completion and PBF.

Natow, et al., (2014) agree with Tandberg and Hillman, citing the myriad of influences and needs of each state on the institutions themselves as something that can clog the mission of PBF. According to their study, exogenous factors, including “state mandates... accreditation

requirements... and third party influence” all impacted institutions in a way that made the use of performance based funding more complicated (Natow, et al., 2014, p. 55). Nisar (2015) notes that students at one college might have decidedly different backgrounds or goals and to penalize based on those predetermined variables would be a mistake. Further, the cost of providing for those students might tilt the scale out of the institution’s favor, but considering the population it is serving, should not be used a punishment (Jenkins, et al., 2009, p. 37).

McClendon, et al (2006) agree that the tying of institutional output to funding is certainly one way to get them listening, but argue that the practicality and process have not always been easy or transparent. While states might succeed in getting their institutions to report data, the question remains as whether or not it is used to make informed decisions. Indeed, many at colleges and universities see the furor around performance based funding as just that – something that is largely a symbolic practice (ASHE report, 2013, p. 57). As the calls for accountability grow louder, we must turn our attention to student outcomes and we must familiarize ourselves with what the institutions should be accountable for: their work product, or graduates.

### **Measuring Student Outcomes in 2016: Retention rates, graduation rates and number of certificates granted**

The ASHE report, *Obstacles to Effectiveness of Performance Funding*, (2013) outlines several output areas that are commonly associated with performance based funding: learning gains, retention and graduation rates, and job placement rates. Below, the review of literature is focused on retention and graduation.

## **Retention**

The idea of optimizing graduation and retention rates is not new – Hamrick, Schuh and Shelley (2004) analyzed different forms of institutional expenditures in order to uncover paths to optimization. His study even accounted for costs such as library expenditures. Of note and importance, the study acknowledged that both graduation and retention rates should be used as the baseline for judging whether or not an institution is effective.

Indeed, Reisberg (1999) has noted that both graduation rate and retention rates have been heavily studied in the policy and academic fields. A good deal of study has revolved around various predictors of the students enrolling in an institution themselves. Hyers and Zimmerman (2002) note that graduation rates are typically greater for students with multiple distinguishing characteristics upon enrollment – including but not limited to – things like test scores or high school rank. Although pre-existent factors are important, they are not the primary focus of this study.

Smith, Liguori, O'Connor and Postle (2009) analyze retention in a unique way. Imagine discovering a way to save one million dollars by simply increasing an institution's retention rate by three percent. In an era of diminishing state funding, increasing revenue by increasing retention rates seems logical. Their research indicated that the traditional methods of dealing with retention issues are aimed at a specific population of students: minority or otherwise at risk student populations (Smith, Liguori, O'Connor & Postle, 2009). One of the elements discovered was a lower retention rate because of bureaucratic quagmire. Holds preventing students from registering from classes or other gatekeeping measures almost assuredly stunted continued enrollment. Imagine a closer analysis of redundant policies that yielded an increase in revenue. Coveted dollars could return to the coffers of institutions that need it badly. The studies of Smith,

et al. highlight an issue that should not be overlooked: retention issues are not necessarily the fault of the student.

A 2011 study conducted by the American Institute for Research corroborated Smith, et al.'s (2009) analysis of retention rates and sunk costs. According to their research, based on the academic year 2008-2009, the total amount of money spent on first time students at community colleges who would become non completers or dropouts was just shy of one billion dollars, an increase of 35% from an analysis conducted five years prior. The same study also noted that during the observation period of their study, the state of Alabama spent \$17,000,000 on "First-year community college students who subsequently dropped out," (p. 10) while the federal government spent \$5,100,000 on the same population of students. (Schneider & Yen, 2011).

If, however, retention rates are, as described by Hamrick, one of the two most important ways of evaluating institutional effectiveness, and as Smith notes, can be negatively impacted by institutional policy, we would be derelict not to search for ways to address deficiencies. Several studies show institutions, at times, choose to spend their time and money on concerns other than retention. Smith would oppose such notions. Astin (1993) points to the almost ironic reality that although it is more expensive to recruit students, institutions spend more on that than they do on retention. Likewise, Hossler (2005) observed that many colleges and universities do not perform enough diligence on the evaluation of their strategic retention programs.

Retention is not merely about the student who chooses to stay or leave – it is vitally important to the institution itself. A (2008) study by Fike, et al, outlines several key reasons why retention rates are important.

1. The retention of students is necessary for financial stability and accountability.



2. Possibility of the Federal Government using graduation rates as a measure of institutional effectiveness. (It should be noted that at the time of publication – October 2008 – the full ramifications of the newly enacted Higher Education Opportunity Act (HEOA) were not yet known. The HEOA did call for a more full disclosure of graduation rates for consumers.)
3. Institutions want their students to succeed, accomplish their goals and enter the workforce.

Bearing in mind the importance retention rates have not just for students but for the institutions themselves, community colleges should be focused on ways to increase retention. Tinto (1993) and Astin (1991) each endeavor to explain the developmental stages of a college student. Tinto's work focuses primarily on the maturation process of the student as both a person and an academician, both being impacted by their respective spheres of influence – the person through social life and the academician through the rigor of the academy. Astin's input-environment-outcome model focuses on the way input and environment impact the outcome of a student. Fike et al (2008) acknowledges that both Astin (1991) and Tinto (1993) ponder ways in which students interact with their institution.

It is critically important to this study and others that a distinction highlighted by Fike et al (2008) is understood: in the study of retention, students who attend community colleges cannot simply be lumped together with those who attend four-year baccalaureate conferring institutions. They are and should be distinguished from one another. As previously noted, the community college grew out of need to serve the community in which it was located while at the same time meet the needs of those who enrolled. A study by Fike, et al., (2008) uses work from Aslanian, Cohen and Brawer, McCabe and Thayer to accentuate the differences. They are outlined below.

1. Students who attend community colleges are usually older than baccalaureate attending students (Aslanian, 2001, p. 29)
2. Community colleges attract a greater number of minority students (Cohen & Brawer, 1996)
3. Community colleges attract a greater number of underprepared students (McCabe, 2000, p. 4)
4. Community colleges attract a greater number of first generation college students (Thayer, 2000, p. 3)

Astin's (1991) input-environment-outcome model becomes increasingly important when we examine the predisposition community colleges have to a more volatile student body. Based on the nature of the community college, with its low barriers to entry and inclusive embrace, the environment becomes more important.

### **Graduation**

According to the Cook and Pullaro's 2010 study, *College Graduation Rates: Behind the Numbers*, the concept of measuring graduation rates is still, relatively speaking, a new practice. In fact, the rates were not compiled for the first time until 1996 (Cook & Pullaro, 2010). Before 1996, states and individual institutions both set their own standard and gathered their own data, creating an environment ripe for confusion (Kelly & Whitefield, 2014). In 1997, the National Center for Education Studies began requiring all Title IV-eligible institutions to report graduation rates to the Integrated Postsecondary Education Data System – IPEDS, for short (Kelly & Whitefield, 2014). Now, just two decades later, the evaluations of retention and graduation rates stand as a staple for determining institutional efficacy.

One of the challenges facing community colleges is how to balance the open enrollment, needs based education they provide with calls for greater accountability. Keeping students on the right track to completion starts first with retention but culminates in the awarding of a degree or certificate. Keeping the door open for enrollees is no longer enough. A framework for those students must also exist before they enroll. The door can remain open, but needs to lead into “a community college with high academic standards that are clearly defined and carefully communicated to current and prospective students” (Habley & McClanahan, 2004, p. 20).

Sullivan (2008) argues that when evaluating community college graduation rates, the researcher needs to take a careful approach when comparing the results with institutions with selective admissions procedures. The graduation rates of an Alabama community college should not be analyzed alongside the graduation rates of an Ivy League university. Nevertheless, the graduation rates at community colleges must still be overserved – even if their populations are volatile. Bailey, Calcagno, Jenkins, Leinbach and Kienzel (2006) rebuff the notion of graduation rates being a poor indicator for community college evaluation. Specifically, they note that students who enroll in community colleges are (a) ambitious; they note that (b) the variations in graduation rates among community colleges do have important things to tell us and should not be disregarded because these institutions have open door policies and a volatile student base; finally (c) they note the importance of using graduation rates to compare comparable institutions, not to single out any particular institution at a given point in time. The authors caution using graduation rates for community colleges to unfairly compare them to institutions that do not share the same limiting factors.

## **Certificates granted**

Hershbein and Kearney's (2014) study noted above shows that any college education, regardless of amount, helps with career earning potential. Certainly, the goal of higher education, prospectively, will not be for everyone to have a Ph.D. by the time they are thirty. However, with the needs of a future workforce pressing, every bit of college education counts. According to Carnevale, Hanson and Rose's Gateway to Gainful Employment and College Degrees study commissioned in 2012, certificates are very technical in nature and "rely on training in specific fields as opposed to the broader general education of two- and four-year degrees" (Carnevale, Rose & Hanson, 2012, p. 1). Included in the same study is a figure that brings additional resonance when considering the certificate: they consist of 22% of postsecondary awards. With almost a quarter of the market share for postsecondary degrees, it is incredibly important to focus on ways to maximize their attainment.

The value community colleges and two-year schools bring in the realm of professional certificates cannot be overstated. Bosworth (2011) notes that declining education attainment is a certain threat to the United States' labor force and that the "most practical route for many individuals... will be to [obtain] not an academic degree but a certificate that signifies completion of a rigorous, occupationally focused program of study" (p. 51). Bosworth lends further credence to his notion with an attention getting bit of information: completion rates in certificate programs have, in some cases, been observed to be higher than in degree granting ones.

Dadgar and Tremble (2015) note that certificates make up 25% of all sub-baccalaureate credentials, up significantly in the past decade. The certificates included in their study for

analysis were considered short credentials, or those that take less than two years to complete. Similarly, this study seeks looks at the same class of credentials.

Grubb (2002) postulated that certain employers seek students with educational attainment greater than a high school degree but less than a baccalaureate degree, while Jacobson and Mokher (2009) note that while the more advanced a degree one has, the more advanced their career earnings potential is, “certificates from two-year colleges also lead to well-paid careers, particularly among low performing students” (p. 1). Jepsen, Troske and Coomes’ (2014) study determined that while there may be varying levels of economic benefit between men and women who receive certificates from community colleges, “degrees, diplomas and certificates all corresponded with higher levels of employment” (p. 1).

Additionally, when regarding certificates granted, it should be noted that Li and Kennedy’s (2018) study regarding performance based funding and the number of certificates granted showed performance based funding had little impact on the actual number of certificates or associates degrees granted. While policymakers are considering ways to incentivize institutions for certain outcomes, perhaps they should also take into account what impacts the number of certificates granted at the institutional level. Optimizing institutional funding expenditures could very well lead to an increased number of certificates granted. Furthermore, Li and Kennedy’s study focused on the possibility of harmful side effects existing when institutions are measured by performance based funding metrics. Instead of maximizing institutional expenditures to enhance outcomes, community colleges could feel threatened by the performance metrics placed on them and fail to recognize internal ways to increase outcomes.

Knowing that the current and future labor force are in need of skilled workers and that career outlook is far better for those with some college education, are policymakers and

institutions of higher learning doing the best they can to maximize their potential as providers of education and the potential of their graduates? Bosworth (2011) asserts that at the state level, leaders should be doing everything they can to ensure robust enrollment in productive certificate courses.

### **Tying it all together: Institutional expenditure and performance**

The amount of research conducted on the effects of institutional expenditures and performance vary greatly by the institutions studied. A good deal of literature exists on the effects of various spending metrics in four year baccalaureate degree granting institutions. The pertinent studies related to these institutions will be outlined and noted. Bailey, Calcagno, Jenkins, Kienzl and Leinbach (2005) note that a large amount of existing research related to community colleges is not focused on institutional or student characteristics as a way of evaluating student outcomes. Instead, the research is centered around the economic benefits that come with the attainment of a two-year degree or the transfer function community colleges offer to students who are seeking an educational end game of baccalaureate degree attainment.

Ryan (2004) analyzed four year colleges to determine whether or not institutional spending had an effect on selected student outcomes. The researcher noted that even though student attrition remained a glaring deficit for colleges and the educational community at large, there was still relatively little research being done that sought to analyze institutional expenditures and their potential effect on the outcomes of students. Notably, the author also posits out that most of the research linking outcomes to expenditures was focused at the primary and secondary level of education, not postsecondary education. Ryan's (2004) research concluded that expenditures did certainly affect persistence and graduation, with instructional and academic support spending having a positive and significant effect on the measures.

Abouzeida (2014) studied the varying effects different patterns of institutional expenditures had on both graduation and retention rates at 4-year baccalaureate degree granting institutions of higher education and found many correlations existed between expenditures and student outcomes. Graduation rates were positively impacted by spending on instruction while there was a negative correlation between graduation rates and institutional support. Indeed, instruction expenditures were shown to have the highest level of correlation between graduation rate and expenditure. When surveying the impact of institutional expenditure and retention rates, both academic support and research correlated positively, while institutional support and public services spending demonstrated negative correlations. Abouzeida's research did not address the same research questions for two year institutions.

Webber (2012) studied four year colleges in the state of Ohio to analyze institutional expenditures and student outcomes. In his study, the researcher sought to satisfy one of the shortcomings of previous research in the field by using restricted-access student-level data. Webber's research included the institutional inputs of student services, instructional expenditures and academic support services expenditures. Interestingly, the researcher was able to use the student-level data he garnered to determine that for students with below average ACT scores, the institutional expenditure which best predicted success was student services. Students who had ACT scores at average or exceeding average were most impacted by instructional expenditures. Finally, his research also noted that for students in Science, Engineering, Mathematics and Technology (STEM) fields, instructional expenditures best predicted success.

Pike, Smart, Kuh and Hayek (2006) looked at several categories of institutional expenditures and correlated them to student engagement and learning. Their study noted a particular paucity of research examining student outcomes as a function of higher education

institutional expenditures. To complete their institutional expenditures variables, the researchers used instruction spending, research spending, public service spending, academic support spending, student support spending, and institutional support spending. The data used for their study was pulled from the integrated postsecondary education data system (IPEDS). Their research yielded a large amount of intricate findings across different types of student engagement and learning outcomes. As a result, the authors noted that “a conceptual model of relationships among expenditures, engagement and outcomes is not readily attainable” (p. 867). They did note that understanding why and where colleges allocate their money is something that needs to be further explored and expanded upon in academic research.

Habley and McClanahan (2004) studied various factors that community colleges reported as having an impact on retention rates. Their study included both four year colleges and two year colleges and included a significant number of metrics. While their research does not directly link institutional performance with student outcomes, the metrics used assuredly fall into categories of institutional expenditures, institutional support, academic support and the like. Their study, while requesting self-reported Likert rankings for how impactful certain practices were, shows an early linkage of institutional input and student outcomes.

Thompson and Riggs (2000), using an economic centered approach, studied two year colleges in the University of Tennessee system to determine how the subject population of their study (14 two year colleges) made changes in their resource allocation based on recognizable outputs. Their study used Tuckman and Chang’s (1990) criteria for resource allocation in institutions of higher education as a framework. Thompson and Riggs (2000) found two year institutions in the state of Tennessee that scored above average in their study spent a greater portion of their revenue on academic support, instruction, student services, and operations and



maintenance. The institutions that scored below average spent a greater portion of their revenue on institutional support, public service and scholarships and fellows.

Bailey, Calcagno, Jenkins, Leinbach and Keinzl (2006) analyzed community college graduation rates. Their study included 915 institutions and pulled data from the integrated postsecondary education data system (IPEDS). Their findings note that several inherent characterizing community college traits had an impact on graduation rates, including correlations between enrollment size, minority composition and part time student rates. Importantly, they also studied the degree to which institutional expenditures impacted graduation rates in their sample. Their study concluded that significant institutional expenditures, like instructional spending per FTE student predicted a greater likelihood of graduation.

The same authors, Bailey, Calcagno, Jenkins, Leinbach and Kienzl, also specifically studied the difference institutional characteristics had on the success of students at community colleges in 2005. The researchers note their study breaks with traditional frameworks for evaluating student success. According to the researchers, most previous studies were grouped around Tinto's Student Integration Model (2003) or Bean's (1985) Student Attrition Model. These models, the researchers note, are valuable, but are largely focused on ways in which administrators and professors could impact student engagement and learning. The 2005 study conducted by Bailey, et al., used a production function framework and analyzed four different types of institutional factors as having a possible impact on student outcomes: general institutional characteristics, compositional characteristics, financial variables and fixed locational characteristics. The researchers noted institutional characteristics like size and the amount of instructors impacted the outcomes of students. Their research did not indicate financial factors

had a significant impact on student outcomes – something they noted, had a demonstrated greater impact at the four-year level.

Isbell (2015) analyzed community college student Milestones and Momentum points as a function of both institutional expenditures and student characteristics in Texas community colleges. The researcher used Astin's Input-Environment-Outcome model as the framework for the study. The milestones chosen for analysis were math readiness, reading readiness, and writing readiness. The momentum points chosen for analysis were completion of a gateway math course, the completion of a gateway English course, the completion of 15 credits, the completion of 30 credits, and the re-enrollment in the second fall semester. The research concluded that institutional expenditures had an impact on the milestones of reading readiness and writing readiness. Math readiness was not was not influenced. Further, institutional expenditures had an effect on the researcher's selected momentum points. Completion of a gateway English course, completion of 30 credits and re-enrollment in the second fall semester were positively impacted. Completion of a gateway math course and completion of 15 credits were not significantly impacted. The researcher noted that not all institutional expenditures had the same effect on all milestones and momentum points.

Goble, Rosenbaum and Stephan (2008) studied institutional attributes and their evaluated impact on individual degree success at two-year colleges. The study used only completion of a degree within eight years of high school graduation as a metric to be studied. The impacting variables were divided into two categories: institutional and individual characteristics. Among the institutional characteristics were the percentage of faculty who were part-time, provision of dormitories, admissions test requirements and a spending component that included academic, administrative, instructional, and student services. Their study determined the most significant

factor in determining student success – as defined by their own parameters – was the percentage of enrollees who were minorities.

Jenkins (2007) offers a possible solution to the problem identified above by Goble, et al. In his study that analyzed institutional effectiveness in Florida community colleges, the researcher looks at student attainment as a function of community colleges being either high or low impact. Included in his rationale for determining whether or not a particular institution qualifies as high or low impact, the researcher uses both instructional and student service expenditures. Jenkins (2007) noted the problem of African American and Latino students not reaching the same level of educational attainment as other students and further suggests that “minority community college students are more likely to succeed at colleges where they are made to feel welcome and where there are support services and programs specifically designed for them” (p. 959). Offering these programs would require institutional expenditure. However, Bailey, et al. (2005) noted that they were surprised to find in one of their studies that higher spending on student services correlated to lower graduation rates. Although perplexed, they offer a reasonable explanation for what they found. Institutions with higher student services spending could have an increased expenditure in that category as a result of a higher proportion of at risk students. Bailey, et al. (2005) speculate that “any positive of the services may be offset by the more problematic characteristics of the students” (p. 8). In the same study, Bailey, et al., determined that lower instructional expenditures were related to lower graduation rates.

## **Summary**

The above review of literature reviewed the history of community colleges in the United States and in the state of Alabama. It demonstrated that state funding for higher education and community colleges in the modern era is constantly in peril. Further, it gave a history of some of the tools lawmakers have supported as a means to address the inadequate provision of services in times of decreased funding. Those tools are often focused on student outcomes, like graduation and retention rates.

The review discussed both of the above mentioned metrics, graduation and retention rates and then presented academic research related to both and institutional expenditures in both four-year and two-year colleges. It is clear that more research needs to be done and presented regarding institutional expenditures and student outcomes – particularly at the state level. In times of reduced funding, calls for increased accountability will pressure lawmakers and institutions to look at the performance of their enrollees. Having the ability to maximize the programs or expenditures that increase retention and graduation rates should be of prime importance to all institutions of higher education. This need highlights the important of research regarding the topic of institutional expenditures and student outcomes.

## CHAPTER 3: METHODS

This study sought to examine and evaluate relationships between expenditures made by Alabama's community colleges and their effects on various outcomes – graduation rates, retention rates and the number of certificates granted. All data used during this study were collected from the National Center for Education Statistics Integrated Postsecondary Education Data System, or IPEDS for short.

After developing descriptive statistics to determine measures of central tendency, the author sought to answer research questions by using a stepwise multiple regression analysis with IBM's Statistical Package for Social Sciences (SPSS) software. The researcher felt a multiple regression analysis was best suited to determine which institutional expenditures, if any, or combination of institutional expenditures, if any, were impacting outcomes. Additionally, Mertla and Vanatta (2010) emphasized the importance of stepwise multiple regression when conducting research where a determination is to be made about the impact of multiple independent variables on an observed dependent variable. Since this research looks at multiple different funding streams as they relate to a single dependent variable (outcome), a stepwise multiple regression was used for statistical analysis.

In addition, the researcher noted any instance of multicollinearity between the independent variables while also assessing residual scatterplots in order to determine if the regression model used was a good fit for the research being done by ascertaining whether linearity or normality had been violated.

## **Purpose of the study**

This study intended to satisfy one of the limitations of academic research while at the same time provide an enhanced understanding of the correlation between institutional spending and performance for Alabama's community colleges. Specifically, the study furthers academic research on community college expenditures and its relation to student outcomes in a specific environment: one state. To assess performance, graduation rate, certificates awarded, and full-time retention rates were used. The expenditures used included an agglomeration of instruction, academic support, student services and institutional support expenditures.

The purpose of this study was to analyze Alabama's community colleges for relationships between expenditures and performance indicators. The subsequent questions sought to reveal potential relationships while adding a new layer of literature to Abouzeida's (2014) research. An additional indicator – certificates granted – was added for this study. The number of certified graduates available is a critical component of Alabama's economy and demonstrates a key measure of a workforce that is ready to meet the state's needs.

It is important to note that not all of the institutional expenditure data used in Abouzeida's study are available for the two-year colleges in Alabama. Specifically, research expenditures and public services expenditures were not analyzed in this study due to lack of availability.

## **Research questions**

The following research questions were used in this study:

1. Which combination, if any, of expenditure components per FTE student best predict total cohort graduation rates in Alabama's community colleges?

2. Which combination, if any, of expenditure components per FTE student best predict retention rates in Alabama's community colleges?
3. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of 1 but less than 2-years?
4. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of less than 1 year?

### **Data source**

The IPEDS data system is widely regarded as the leading repository of postsecondary data – primarily due to a congressional mandate for the data to be collected and stored (Cook & Pullaro, 2010). From the IPEDS website:

The National Center for Education Statistics (NCES) is the primary federal entity for collecting and analyzing data related to education in the U.S. and other nations. Located within the U.S. Department of Education and the Institute of Education Science, NCES fulfills a Congressional mandate to collect, collate, analyze, and report complete statistics on the condition of American education; conduct and publish reports; and review and report on education activities internationally.

### **Sample**

This research is focused solely on the community colleges within the state of Alabama. As a result, all data selected from IPEDS is limited in nature to the 26 institutions that meet such criteria. The sample size (N=26) allows the researcher to gain a clear picture of what is happening over a given time period in Alabama's public community colleges and technical schools. This research analyzed 12 years of expenditure data that were reported to the IPEDS database and 12 years of outcomes data, also as reported to the database.

### **Data specifics, preparation, and variables**

The IPEDS database defines institutional expenditures in seven different ways, but for the purpose of this study, some of those definitions were omitted as they were not applicable or reported by Alabama's public community colleges to the IPEDS database. For example, the seven definitions of institutional expenditures found in IPEDS are instructional expenditures, research expenditures, public service expenditures, academic support expenditures, student services expenditures, institutional support expenditures, and other expenditures. Some of those expenditures are extremely pertinent to baccalaureate degree granting institutions, but are not applicable in the same way at two year schools. For instance, research and public service expenditures data were not complete or reported to IPEDS by the sample population in this study. This is somewhat intuitive and should not be overlooked – some of the community colleges in Alabama are in largely rural areas and simply do not have the budgets or ability to fund research or have public service expenditures. From the list of seven expenditures, four were chosen to examine in this study.

The four expenditure components that were all reported by the sample population to IPEDS are instruction expenditures, academic support expenditures, student services expenditures and institutional support expenditures. Omitting the other three expenditure components IPEDS has was a choice made of necessity.

In order to streamline the analyses of the data and as a result of a relatively small sample size (N=26), averages were used to make over a decade worth of data for each independent and dependent variable more easily manipulated and interpreted. The purpose of the research was not to quantify anything on a year-by-year or cohort basis but rather to gain a high-level understanding of what institutional expenditures, if any, impacted certain outcomes in Alabama's



community colleges. Averaging the expenditures as well as the outcomes allowed for a clean execution of the regression analysis to take place.

Listed below are the variables, the code assigned to them for later reporting and the research question they belong to:

Table 1

*Variables and codes used for research question 1*

<b>Dependent variable</b>	
Variable	Code
Graduation rate	GRAD
<b>Independent variables</b>	
Variable	Code
Instruction expenditures	INST
Academic support expenditures	ACAD
Student services expenditures	SSE
Institutional support expenditures	ISE

Table 2

*Variables and codes used for research question 2*

<b>Dependent variable</b>	
Variable	Code
Retention rate	RET
<b>Independent variables</b>	
Variable	Code
Instruction expenditures	INST
Academic support expenditures	ACAD
Student services expenditures	SSE
Institutional support expenditures	ISE

Table 3

*Variables and codes used for research question 3*

<b>Dependent variable</b>	
Variable	Code
Cert >1, <2 rate	CERT 1-2
<b>Independent variables</b>	
Variable	Code
Instruction expenditures	INST
Academic support expenditures	ACAD
Student services expenditures	SSE
Institutional support expenditures	ISE

Table 4

*Variables and codes used for research question 4*

<b>Dependent variable</b>	
Variable	Code
Cert >2, <4 rate	CERT <1
<b>Independent variables</b>	
Variable	Code
Instruction expenditures	INST
Academic support expenditures	ACAD
Student services expenditures	SSE
Institutional support expenditures	ISE

### **Summary**

This quantitative, non-experimental study gathered data from the integrated postsecondary education data systems (IPEDS) database and utilized three stepwise multiple regression analyses to determine whether or not a predictive relationship existed between institutional expenditures and student outcomes in Alabama’s community colleges.

## CHAPTER 4: FINDINGS

The focus of this research was to determine whether or not certain institutional expenditures impacted or were predictive of outcomes. In order to best assess whether selected expenditures did have a predictive relationship, institutional support expenditures, academic support expenditures, student services expenditures and instructional expenditures were analyzed alongside the outcomes of graduation rates, retention rates, and the number of certificates granted.

Hamrick, et al noted that both graduation and retention rates can be used as markers of institutional effectiveness when compared with institutional expenditure. Additionally, Bosworth (2011), Grubb (2002) and Jacobson and Mohker (2009) show that the certificate granting ability of a two-year school has an impact on earning potential and the labor force. Understanding ways to maximize the attainment of these certificates is of utmost importance to the evolving world in which we live.

This chapter presents the results of the posed research questions in sequential order. For each research question, a stepwise multiple regression analysis was used - as suggested by Mertler and Vanatta (2010) - to ascertain whether or not a predictive relationship existed between institutional expenditures and student outcomes in Alabama's community college system.

### **Purpose of the study**

This study intended to satisfy one of the limitations of academic research while at the same time provide an enhanced understanding of the correlation between institutional spending

and performance for Alabama's community colleges. Specifically, the study furthers academic research on community college expenditures and its relation to student outcomes in a specific environment: one state. To assess performance, graduation rate, certificates awarded, and full-time retention rates were used. The expenditures used included an agglomeration of instruction, academic support, student services and institutional support expenditures.

The purpose of this study was to analyze Alabama's community colleges for relationships between expenditures and performance indicators. The subsequent questions sought to reveal potential relationships while adding a new layer of literature to Abouzeida's (2014) research. An additional indicator – certificates granted – was added for this study. The number of certified graduates available is a critical component of Alabama's economy and demonstrates a key measure of a workforce that is ready to meet the state's needs.

It is important to note that not all of the institutional expenditure data used in Abouzeida's study are available for the two-year colleges in Alabama. Specifically, research expenditures and public services expenditures were not analyzed in this study due to lack of availability.

### **Research questions**

The following research questions were used in this study:

1. Which combination, if any, of expenditure components per FTE student best predict total cohort graduation rates in Alabama's community colleges?
2. Which combination, if any, of expenditure components per FTE student best predict retention rates in Alabama's community colleges?
3. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of 1 but less than 2-years?

4. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama’s community colleges of less than 1 year?

**Results for research question 1**

**Which combination, if any, of expenditure components per FTE student best predict total cohort graduation rates in Alabama’s community colleges?**

The dependent variable for the first research question in this study was the total cohort graduation rate (GRAD), expressed as a percentage value for Alabama’s community college system. Averages were used to in order to help the researcher ascertain a high-level trend with enough years to smooth any outliers. The independent variables used for this research question were the following institutional expenditures: instruction expenditures (INST), academic support expenditures (ACAD), student services expenditures (SSE), and institutional support expenditures (ISE). Table 5 below summarizes the input.

Table 5:

*Inputs for research question 1*

Sample size: N=26 institutions				
<b>Dependent variable</b>				
	Min	Max	Mean	Standard deviation
GRAD	8.92	44.50	21.9	9
<b>Independent variables (in \$)</b>				
	Min	Max	Mean	Standard deviation
INST	3434853.14	22934208.07	11105839.7600	5829959.63466
ACAD	617953.79	3525828.71	1894183.70	894408.12151
SSE	895922.07	6240122.93	2989651.7457	1488222.13856
ISE	1356040.14	7636215.79	3795623.5943	2061933.84910

A stepwise multiple regression analysis was used in order to determine which independent variables (INST, ACAD, SSE or ISE) had a predictive relationship with the dependent variable GRAD. The regression model determined that of the four independent variables, only one, institutional support expenditure, INST had a predictive relationship with the dependent variable GRAD. In this analyses, ISE had a p value of  $<.001$ , ACAD had p value of  $.991$ , SSE had a p value of  $.608$  and INST had a p value of  $.729$ . Since only one of the independent variables was predictive, the presence of and potential problems accompanying multicollinearity were not an issue.

Observation of residuals showed normalcy and linearity were not violated, meaning the regression analysis was a good fit.

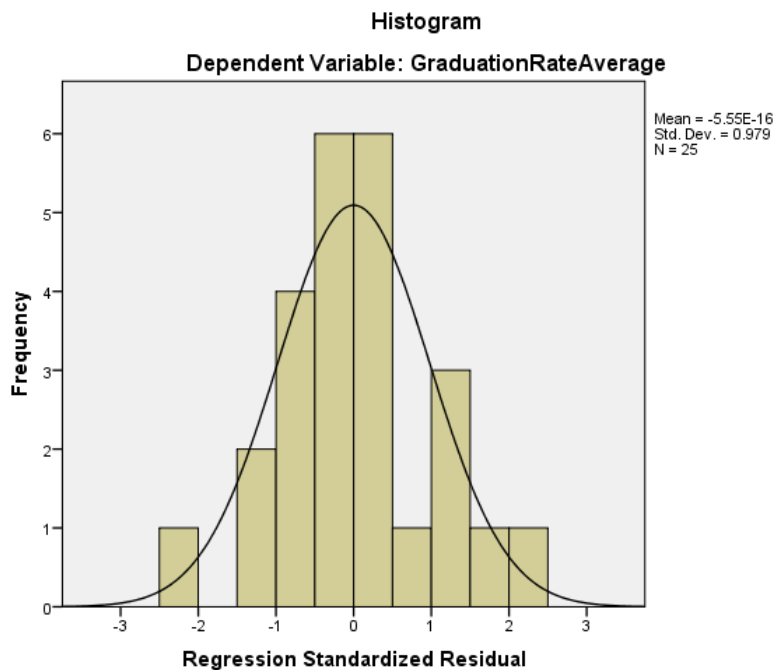


Figure 2: Residuals indicate the normal distribution of the regression analysis

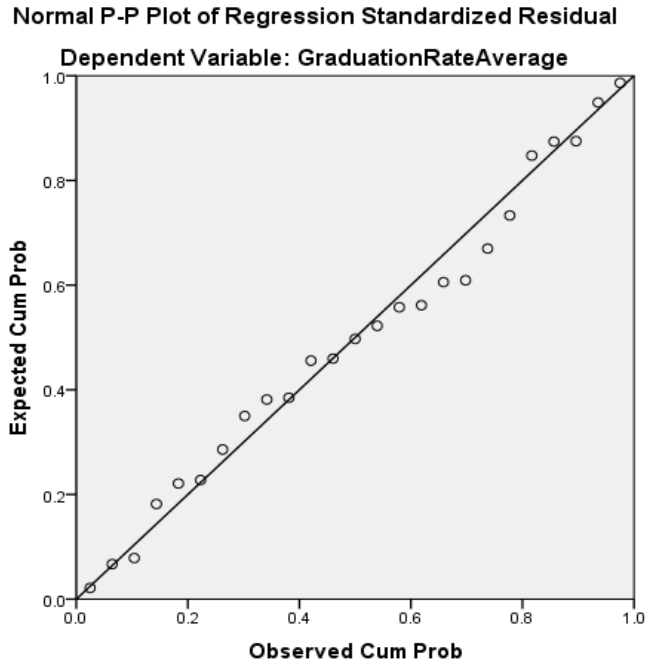


Figure 3: *Residuals indicate the linearity of the regression analysis*

### **Results for research question 2**

#### **Which combination, if any, of expenditure components per FTE student best predict retention rates in Alabama community colleges?**

The dependent variable for the second research question in this study was the full-time retention rate (RET), expressed as a percentage value for Alabama’s community college system. Averages were used to in order to help the researcher ascertain a high-level trend with enough years to smooth any outliers. The independent variables used for this research question were the following institutional expenditures: instruction expenditures (INST), academic support expenditures (ACAD), student services expenditures (SSE), and institutional support expenditures (ISE). Table 6 below summarizes the input.



Table 6:

*Inputs for research question 2*

Sample size: N=26 institutions				
<b>Dependent variable</b>				
	Min	Max	Mean	Standard deviation
RET	37.42	63.00	53.5481	6.08916
<b>Independent variables (in \$)</b>				
	Min	Max	Mean	Standard deviation
INST	3434853.14	22934208.07	11105839.7600	5829959.63466
ACAD	617953.79	3525828.71	1894183.70	894408.12151
SSE	895922.07	6240122.93	2989651.7457	1488222.13856
ISE	1356040.14	7636215.79	3795623.5943	2061933.84910

A Stepwise multiple regression analysis was used in order to determine which independent variables (INST, ACAD, SSE or ISE) had a predictive relationship with the dependent variable RET. The regression analysis indicated that none of the independent variables had a predictive relationship.

**Results for research question 3**

**Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama’s community colleges of 2 but less than 4-years?**

The dependent variable for the third research question in this study was the number of certificates granted of 2 but less than 4 years (CERT 2-4) in Alabama’s community college system. Averages were used to in order to help the researcher ascertain a high level trend with enough years to smooth any outliers. The independent variables used for this research question

were the following institutional expenditures: instruction expenditures (INST), academic support expenditures (ACAD), student services expenditures (SSE), and institutional support expenditures (ISE). Table 7 below summarizes the input.

Table 7:

*Inputs for research question 3*

Sample size: N=26 institutions				
<b>Dependent variable</b>				
	Min	Max	Mean	Standard deviation
CERT 1-2	7.25	204.58	88.26	46.56
<b>Independent variables (in \$)</b>				
	Min	Max	Mean	Standard deviation
INST	3434853.14	22934208.07	11105839.7600	5829959.63466
ACAD	617953.79	3525828.71	1894183.70	894408.12151
SSE	895922.07	6240122.93	2989651.7457	1488222.13856
ISE	1356040.14	7636215.79	3795623.5943	2061933.84910

A stepwise multiple regression analysis was used in order to determine which independent variables (INST, ACAD, SSE or ISE) had a predictive relationship with the dependent variable CERT 1-2. The regression model determined that of the four independent variables, only one, student services expenditures, SSE had a predictive relationship with the dependent variable CERT 1-2. In this analyses, SSE had a p value of <.001, ACAD had p value of .801, INST had a p value of .748 and ISE had a p value of .753. Since only one of the independent variables was predictive, the presence of and potential problems accompanying multicollinearity were not an

issue. Observation of residuals showed normalcy and linearity were not violated, meaning the regression analysis was a good fit.

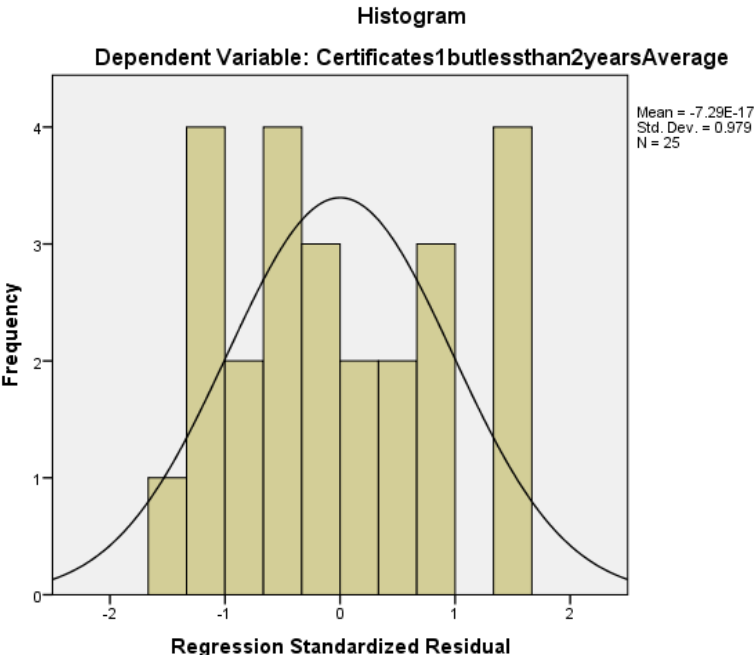


Figure 4: Residuals indicate the normal distribution of the regression analysis

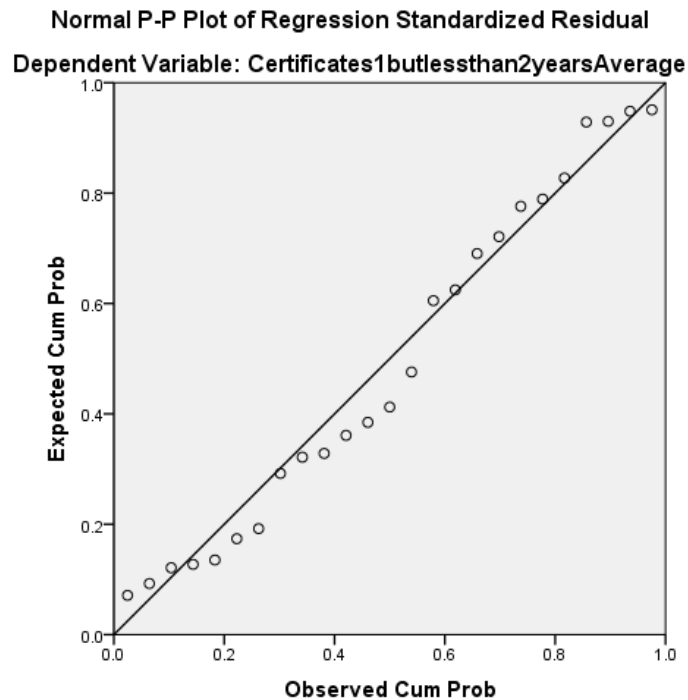


Figure 5: *Residuals indicate the linearity of the regression analysis*

#### **Results for research question 4**

**Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama’s community colleges of less than 1 year?**

The dependent variable for the fourth and final research question in this study was the number of certificates granted of less than one year (CERT <1) in Alabama’s community college system. Averages were used to in order to help the researcher ascertain a high level trend with enough years to smooth any outliers. The independent variables used for this research question were the following institutional expenditures: instruction expenditures (INST), academic support expenditures (ACAD), student services expenditures (SSE), and institutional support expenditures (ISE). Table 8 below summarizes the input.

Table 8:

*Inputs for research question 4*

Sample size: N=26 institutions				
<b>Dependent variable</b>				
	Min	Max	Mean	Standard deviation
CERT <1	.00	273.83	103.15	76.93
<b>Independent variables (In \$)</b>				
	Min	Max	Mean	Standard deviation
INST	3434853.14	22934208.07	11105839.7600	5829959.63466
ACAD	617953.79	3525828.71	1894183.70	894408.12151
SSE	895922.07	6240122.93	2989651.7457	1488222.13856
ISE	1356040.14	7636215.79	3795623.5943	2061933.84910

A stepwise regression analysis was used in order to determine which independent variables (INST, ACAD, SSE or ISE) had a predictive relationship with the dependent variable CERT <1. The regression model determined that of the four independent variables, only one, instruction expenditures, INST had a predictive relationship with the dependent variable CERT <1. In this analysis, INST had a p value of <.001, ACAD had p value of .209, SSE had a p value of .787 and ISE had a p value of .515. Since only one of the independent variables was predictive, the presence of and potential problems accompanying multicollinearity were not an issue. Observation of residuals showed normalcy and linearity were not violated, meaning the regression analysis was a good fit.

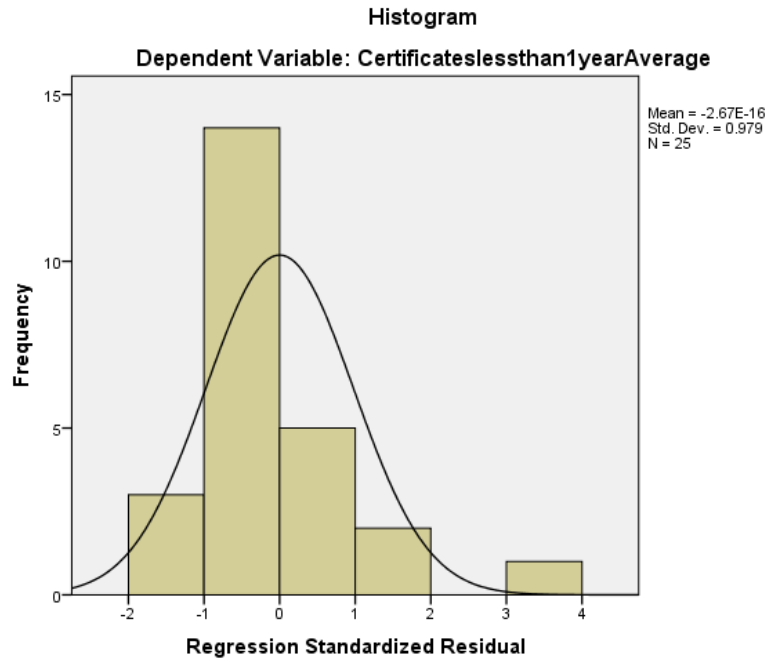


Figure 6: Residuals indicate the normal distribution of the regression analysis

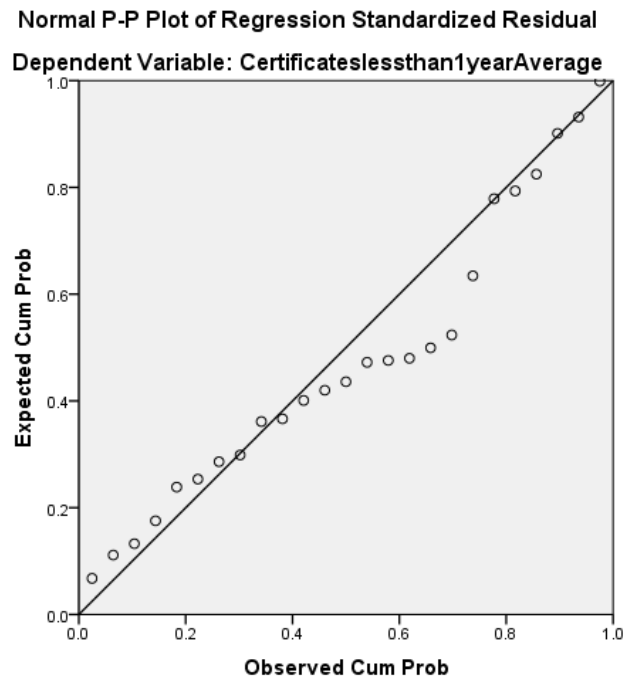


Figure 7: Residuals indicate the linearity of the regression analysis

## Summary

The results of this quantitative, non-experimental study show that there are relationships that exist between institutional expenditures and certain outcomes in Alabama's community colleges. After gathering data from the Integrated Postsecondary Education Data System (IPEDS), stepwise multiple regression analyses were used to determine which relationships between institutional expenditures and outcomes were predictive. The analysis indicated that of the four analyses run, three models were predictive in nature. For the first research question, institutional support expenditures were found to have a predictive relationship on graduation rates. For the second research question, no variable was found to have an impact on retention rates. For the third research question, student support expenditures were found to have a predictive relationship on the number of certificates granted between two and four years in length. The final research question found that there was a predictive relationship between instructional expenditures and the number of certificates granted that were less than one year in length.

## CHAPTER 5: CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS FOR FUTURE RESEARCH

At a time where state funding for higher education is under increasing scrutiny (Zeidenberg 2008), the need to maximize performance while under constraint is paramount. The Alabama Community College system has related mission and vision statements. The mission statement is: “To provide a unified system of institutions dedicated to excellence in delivering academic education, adult education and workforce development” (Alabama Community College System). Determining the most cost effective manner in which to deliver this academic education must be a priority. The vision statement, likewise, accentuates a vision where the system “Develop[s] an educated, prosperous population by providing an affordable pathway to help citizens of any walk or stage of life succeed through quality education and training; a community college system where education works for all” (Alabama Community College System).

While acknowledging the original design of community colleges nationwide was to provide for the communities they are a part of, we must be aware of the most practical ways to enhance student outcomes while being economically efficient getting there.

Hamrick, et al. (2004) noted that retention and graduation rates are two of the most important ways of evaluating institutional effectiveness. Additionally, the Hershbein and Kearney’s (2014) study noted the lifetime career earnings potential and differential between those with no, some or advanced college experience is critically important in understanding what the future holds as far as employability and population demographics are concerned. Bosworth



(2011) was quick to point out that state policymakers should be doing everything they can in order to get students into certificate programs, echoing Hershbein and Kearney's study's findings: a certificate has the potential to not only impact the recipient, but also the economy when the recipient enters it as a contributor.

This study sought to provide original research about the ways community colleges can economize their institutional expenditures in order to maximize their institutional and student outcomes. Studies comparing funding streams to outcomes have been plentiful at the four-year baccalaureate level, but are not as widely available at the community college level. Furthermore, this research was conducted on one particular state: Alabama and its community college system.

Although this study is in no way binding or even necessarily recommending in its nature, it is a conversation starter about ways in which the state of Alabama's community college system – or systems in similar peer states – can approach the subject of institutional expenditures *as they relate* to student and institutional outcomes.

### **Purpose of the study**

This study intended to satisfy one of the limitations of academic research while at the same time provide an enhanced understanding of the correlation between institutional spending and performance for Alabama's community colleges. Specifically, the study furthers academic research on community college expenditures and its relation to student outcomes in a specific environment: one state. To assess performance, graduation rate, certificates awarded, and full-time retention rates were used. The expenditures used included an agglomeration of instruction, academic support, student services and institutional support expenditures.

The purpose of this study was to analyze Alabama's community colleges for relationships between expenditures and performance indicators. The subsequent questions sought to reveal

potential relationships while adding a new layer of literature to Abouzeida's (2014) research. An additional indicator – certificates granted – was added for this study. The number of certified graduates available is a critical component of Alabama's economy and demonstrates a key measure of a workforce that is ready to meet the state's needs.

It is important to note that not all of the institutional expenditure data used in Abouzeida's study are available for the two-year colleges in Alabama. Specifically, research expenditures and public services expenditures were not analyzed in this study due to lack of availability.

### **Research questions**

The following research questions were used in this study:

1. Which combination, if any, of expenditure components per FTE student best predict total cohort graduation rates in Alabama's community colleges?
2. Which combination, if any, of expenditure components per FTE student best predict retention rates in Alabama's community colleges?
3. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of 1 but less than 2-years?
4. Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of less than 1 year?

All Data gathered for this study were taken from the Integrated Postsecondary Education Data Systems. The total number of institutions used was N=26, Alabama's community colleges.

They are:

- Alabama Southern
- Lawson State
- Bevill State
- Lurleen B. Wallace

- Bishop State
- Calhoun
- Central Alabama
- Chattahoochee Valley
- Drake State
- Enterprise State
- Faulkner State
- Gadsden State
- Ingram
- Jeff Davis
- Jefferson State
- Northeast Alabama
- Northwest Shoals
- Reid State
- Shelton State
- Snead State
- Southern Union
- Trenholm State
- Wallace – Dothan
- Wallace – Hanceville
- Wallace – Selma
- Marion Military

Stepwise multiple regression analysis was used to analyze what, if any, predictive relationships existed between institutional expenditures and outcomes. This chapter presents the results of those analyses, commentary, and recommendations for future research.

### **Implications**

**Implications for research question 1:** Which combination, if any, of expenditure components per FTE student best predict total cohort graduation rates in Alabama’s community colleges?

The multiple regression analysis used to analyze the first research question yielded a statistically significant finding: institutional support had a predictive relationship with graduation rates. The other variables, instruction expenditures, academic support expenditures and student services expenditures lacked any form of predictive relationship with graduation rates.

As defined by IPEDS, institutional support expenditures are: “Expenses for the day-to-day operational support of the institution. [Institutional support expenditures also] includes expenses for general administrative services, central executive-level activities concerned with management and long-range planning, legal and fiscal operations, space management, employee personnel and records, logistical services such as purchasing and printing, and public relations and development. [Institutional support expenditures also] includes information technology expenses related to institutional support activities. If an institution does not separately budget and expense information technology resources, the IT costs associated with student services and operation and maintenance of plant will also be applied to this function.” (NCES).

Using the definition of institutional support expenditures provided by IPEDS, as well as the results from the multiple regression analysis, the following conclusion can be made: Robust administrative or managerial structures can impact graduation rates.

Interestingly, this results from the question seem to stand in contradiction to those results found in Abouzeida’s (2014) research done at the four-year, baccalaureate degree granting level. In his study, there was not only no predictive relationship between institutional support expenditures and graduation rates, but there was actually a negative predictive relationship. In analyzing this difference between Alabama’s community colleges and Abouzeida’s research, we can ascertain several things that could possibly account for the difference.

- This study focused only on community colleges in Alabama, while Abouzeida’s focused on four year colleges nationwide. The population difference alone could account for some of that difference.
- We must be cognizant of the size of the institutions and their respective missions.

Although certainly not an indictment of four year colleges, it is possible that the

institutional support expenditures get watered down with increased institutional size.

Perhaps institutional support expenditures go further and have a predictive relationship in community colleges because those institutions have smaller bureaucracies and lower enrollment.

The results from research question #1 indicate that community colleges in Alabama should be aware of what they are spending on institutional support expenditures, as they have a direct, and statistically significant, predictive relationship on graduation rates.

**Implications for research question 2:** Which combination, if any, of expenditure components per FTE student best predict retention rates in Alabama's community colleges?

The results of research question 2 indicated that no combination of expenditure components, nor any one expenditure component had a predictive relationship on retention rates in Alabama's community college system. The results for this question, while leaving a statistically significant finding to be desired, are not entirely surprising. Recall Fike and Fike's (2008) work on the things that make community colleges unique, particularly as it relates to student body's inherent volatility:

1. Students who attend community colleges are usually older than baccalaureate attending students (Aslanian, 2001, p. 29).
2. Community colleges attract a greater number of minority students (Cohen & Brawer, 1996).
3. Community colleges attract a greater number of underprepared students (McCabe, 2000, p. 4).
4. Community colleges attract a greater number of first generation college students (Thayer, 2000, p. 3).

The regression analysis used to evaluate this question yielded no predictive relationships. We must recognize that there is some precedence for such a finding: Fike and Fike's work indicates that retention rates are notoriously tricky to evaluate at the community college level due in large part, among other reasons, because of the different nature of the student. Although a statistically significant finding would have perhaps been exciting, this non-significant finding is just as easily recognizable as being confirmation of the different nature of community colleges and their students and that more work needs to be done in developing metrics used to study and analyze the somewhat ethereal retention rates of community colleges.

**Implications for research question 3:** Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama's community colleges of 1 but less than 2-years?

The results for the next two research questions regarding certificates granted were exceptionally interesting, and perhaps have the greatest implications for future consideration. Research questions three and four deal directly with predictive relationships between certificates granted and institutional expenditures. Recall the Hershbein and Kearney's (2014) study and the need the difference varying levels of higher education have on the future financial and economic outcomes. These questions stand-alone – they do not compare with previous research conducted at the four-year, baccalaureate level and provide great insight.

The multiple regression analysis used to analyze the third research question yielded a statistically significant finding: student services expenditures had a predictive relationship with the number of certificates granted whose duration, for attainment purposes, is between one and two years in length. The other variables, instruction expenditures, academic support expenditures and institutional support expenditures lacked any form of predictive relationship with the number

of certificates granted whose duration, for attainment purposes, is between one and two years in length.

As defined by IPEDS, student services expenditures are: “Expenses for admissions, registrar activities, and activities whose primary purpose is to contribute to students emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. Examples include student activities, cultural events, student newspapers, intramural athletics, student organizations, supplemental instruction outside the normal administration, and student records. Intercollegiate athletics and student health services may also be included except when operated as self-supporting auxiliary enterprises. [Student services expenditures] also may include information technology expenses related to student service activities if the institution separately budgets and expenses information technology resources (otherwise these expenses are included in institutional support.) Institutions include actual or allocated costs for operation and maintenance of plant, interest, and depreciation” (NCES).

Using the definition of student services expenditures provided by IPEDS, as well as the results from the multiple regression analysis, the following conclusion can be made: A student enrolled in a certificate program that takes between one and two years to complete is impacted by the level of student services expenditures. This is interesting for one critical reason: does the length of stay, in a certificate program, change what institutional expenditures are predictive?

We will see later on that a different institutional expenditure is predictive for a shorter certificate program. It can be surmised that for certificates whose attainment takes between one and two years, things that contribute to the emotional and social well-being of students are very important. The longer one is enrolled in a certificate program, the more non-academic support

they need or seek. Although Abouzeida (2014) did not study certificates granted – these offerings are a distinct difference between community colleges and four-year schools, he did find that, in many cases, student services expenditures did not have a positive predictive relationship with the outcomes (graduation and retention rates) that were observed.

**Implications for research question 4:** Which combination, if any, of expenditure components per FTE student best predict certificates granted in Alabama’s community colleges of less than 1 year?

As hinted previously, there was a different predictive institutional expenditure for certificates whose length for attainment is less than one year. The multiple regression analysis used to analyze the fourth research question yielded a statistically significant finding: instructional support expenditures had a predictive relationship with the number of certificates granted whose duration, for attainment purposes, is less than one year length. The other variables, student services expenditures, academic support expenditures and institutional support expenditures lacked any form of predictive relationship with the number of certificates granted whose duration, for attainment purposes, is less than one year in length.

As defined by IPEDS, instructional support expenditures are “Expenses of the colleges, schools, departments, and other instructional divisions of the institution and expenses for departmental research and public service that are not separately budgeted. Includes general academic instruction, occupational and vocational instruction, community education, preparatory and adult basic education, and regular, special, and extension sessions. [Instructional support expenditures] also includes expenses for both credit and non-credit activities. Excludes expenses for academic administration where the primary function is administration (e.g., academic deans). Information technology expenses related to instructional activities if the institution separately



budgets and expenses information technology resources are included (otherwise these expenses are included in academic support). Institutions include actual or allocated costs for operation and maintenance of plant, interest, and depreciation” (NCES).

Using the definition of student services expenditures provided by IPEDS, as well as the results from the multiple regression analysis, the following conclusion can be made: for these short-term certificates of less than one year in length for attainment purposes, the expenditures spent on instruction both vocational and occupational, have a direct impact on the attainment of certificates. This finding is critical. Vocational certificates, by nature, relate to occupation or employment. Without quality instruction in these categories, it can be surmised that the number of certificates granted by a community college are predicted by the amount it spends on those vocational and occupational instructors. Who better to teach a welding class than a career welder?

### **Conclusions**

This study sought to determine whether or not a predictive relationship exists between institutional expenditures made by community colleges and outcomes. The expenditures, student support expenditures, academic support expenditures, instructional support expenditures and institutional support expenditures were analyzed by stepwise multiple regression to determine whether or not they were predictive of graduation rates, retention rates and the number of certificates granted in Alabama’s 26 community colleges.

The results of the analyses conducted indicated a predictive relationship does exist between institutional support expenditures and graduation rates. There were no predictive relationships between retention rates and any of the institutional expenditures. The two types of certificates being studied both had predictive relationships with certain institutional expenditures.

For certificates whose length to completion required between one and two years, student services expenditures showed a predictive relationship. For certificates whose length to completion required less than one year, instructional expenditures had a predictive relationship.

Though this research was unique in that it observed only the 26 schools in Alabama's community college system, its results were both supportive and contradictory of existing literature on institutional expenditures and outcomes. The findings on graduation rates contradicted studies conducted at the four-year level; the findings for retention rates supported existing research that accentuates the tricky nature of using retention to evaluate community colleges. The findings for certificates are entirely original and are not comparable to existing work.

### **Implications for practice**

In order to economize institutional expenditures to maximize student outcomes, community colleges in Alabama, and similar peer states, should acknowledge that there are factors which contribute directly to both institutional and student success. While every institution certainly needs to take into account its own needs in the context of the community and student body it supports, efforts should be made to focus on the elements that have the greatest chance of impacting student and institutional success.

When concerning policymaking, lawmakers and stakeholders should be aware of the things that are predictive if and when considering things like performance based funding. Simply asking an institution to deliver a certain outcome might ignore one or more of the most fundamental concepts underpinning the success or failure of that outcome: the level of institutional expenditures made that are predictive of a better outcome.

### **Recommendations for future research**

This study sought to provide new and original research regarding predictive relationships between institutional expenditures and outcomes in Alabama's community college system. Although similar studies have been conducted at the four-year level, there are relatively few that have been conducted at the two-year level. In order to gain a broader picture of the results that were found in this research, future research could study a cohort of peer states or all community colleges in the United States. This study focused on a distinctly Southern state in the United States and the results found after analysis might differ significantly from a northwestern or northeastern state. It is critically important to recognize the role community colleges have in the training of the future workforces. Additional research on maximizing outcomes in these institutions is encouraged.

### **Summary**

This quasi-experimental study sought to analyze predictive relationships between institutional expenditures and community college outcomes in Alabama. The researcher gathered data from the Integrated Postsecondary Education Data System and then used stepwise multiple regression analysis in SPSS to determine whether or not a relationship existed. Several expenditures, institutional support expenditures, student services support expenditures and instructional support expenditures were found to have predictive relationships on outcomes. It is the hope of the researcher that the results of this study will be used as a conversation starter for future decisions regarding institutional expenditures in community colleges in Alabama.

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