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Comparing Success Rates Of Online Courses To Traditional Courses In A Small Rural Community College

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DEDICATION

This dissertation is dedicated to my parents, Earsel and Barbra Frazier, my wife April, daughters Morgan and Colleen, and son Jacob. All sacrificed much so I could achieve this goal.

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ABSTRACT

The purpose of this dissertation is to examine how academic performance of the online learning mode compares with the traditional face-to-face mode in rural community colleges. As online learning has become a popular instructional offering among many rural community college students seeking to advance their opportunities, so has the level of scrutiny. The perception of online courses is to be of lesser academic rigor and quality than their face-to-face counterparts. In this study I will (1) examine the demand for online courses in rural community colleges, (2) explore how state governments are linking community college funding to course success rates, (3) discuss the role course design plays in online success rates, (4) review the prevalent research comparing academic performance between online and face-to-face courses, (5) report on the findings obtained by comparing the performance of online and face-to-face courses.

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CHAPTER 1

INTRODUCTION

Community colleges have long been the gateway for students to obtain vocational opportunities and enrich their lives (Liest & Travis, 2010). Unlike students living in urban areas, rural students often live far from educational centers and must travel to obtain and education (Cejda, 2007). Travel time, geographic isolation, and a need to work, often limits educational opportunities for many rural students (Liest, 2010). Rural Community colleges have attempted to address this issue by developing and offering online courses to assist students (Cejda, 2012).

Traditional on-campus based courses may not be an option for many rural students who need to work while attending college (Cejda, 2012) Other instructional option is needed to satisfy their academic needs. Without access to such an option, these students face a dire economic future. Lacking the funds to attend a residential four-year college they turn to community colleges to assist them in crafting a sustainable livelihood (Glover & Lewis, 2012). Online education is not just an option for such students, it is their only means of accessing higher education opportunities.

Each year students from rural communities enter community college seeking a pathway to a better life. Some are traditional students who have just left high institution. Others are returning to institution later in life seeking to improve their vocational opportunities. For many, institution was only dream. They possessed neither the money, time, nor opportunity to obtain a higher education (Lesit, 2010).

However, online education has provided these students with the chance to achieve their dream. A college education is now within the grasp of anyone who possess an internet collection and a computer.

While the move to online education has offered educational opportunities to students and enrollment to colleges, it has also forced higher education institutions and those financially supporting them, to question if the education online students receive is equal to traditional on-campus courses (Smith, 2016). Supporters of the online mode have clashed with those preferring the traditional on-campus courses (McKenzie, 2017). On-campus supporters, more comfortable with older, and according to some faculty, more reliable methods of learning, have questioned success rates in online courses (Barber, 2011). In a survey conducted by Allen and Seaman (2003), 42.8% of faculty indicated that online education produced inferior learning outcomes.

Faculty and other college personnel are not alone in their mistrust of online education success rates (Smith, 2016) as rural community college spending has under scrutiny. Many states have instituted performance-based funding formulas to make colleges accountable (Spalding, 2017) and control spending. Student course success and funding are now directly tied. If a college has poor student success, they could face losing a significant portion of their overall income. Colleges are now directly invested in producing courses that lead to high success rates (Pitts, 2020).

Given student desire for online courses, the college's need to locate additional enrollment, and the state's use of performance-based funding, rural community

colleges are facing a critical problem (Smith, 2016). Rural community colleges need additional information on how online course match up with on-campus courses to determine how the institution's resources can be allocated (Smith, 2016). But before colleges can act, information on student success is required. College must first determine if online courses offer students the same chances at success as face-to-face courses. Therefore, this study will attempt to determine if a difference if online and on-campus modes produce the same grades.

PROBLEM STATEMENT

While students may desire the opportunities that online courses offer, there are some who believe that the instructional mode may lack instructional quality and produce an inferior product from on-campus courses. Students taking online courses may be at greater risk of failure. Given the Grades among the online population may differ from those attained in on-campus courses. If true, this could indicate issues with how the course operates.

Unlike traditional on-campus courses, online courses often carry the stigma of being easy. As online courses grow and become a more mainstream academic instructional offering, so does the level of scrutiny. Some envision the courses to be an easy path toward degree attainment and believe online coursework is no match for "real" academic courses (Ung, 2015). Such beliefs have haunted online development since for years and have resulted in claims of illegitimacy (Legatt, 2017).

Small rural higher education institutions such as Southeast Appalachian Community Colleges (SACC) face a series of issues centering around grade production

in online courses. First, the college needs a method to maintaining enrollment. A steady decline in the population the college serves has resulted in fewer students enrolling in college. Second, the use of performance-based funding models could result in financial loss for the college. A portion of college funding is now based on course success rates. Last, segments of the college faculty have resisted adopting the online mode. They perceive the online mode as a poor substitute for on-campus instruction and have called for the college to limit the number of online courses despite growing student demand. Given the growing demand for online courses, coupled with the college's need to locate additional sources of revenue, it is doubtful that the institution will choose to place limits on the option in most demand. The institution is not able to support itself and fulfill its mission without the online course offerings. Therefore, the choice to switch to online as the predominate mode of instruction may seem simple, but questions remain on how successful students are in online courses.

SACC needs to produce data that demonstrates how successful online courses are in comparison with on-campus courses. If the online mode is does not produce equal grades rates as those attained in on-campus courses changes would need to be implemented to preserve the mode and maintain funding. Unless SACC can demonstrate equal grades between online and on-campus modes the college could lose their best revenue stream and be forced to make sever financial decisions.

PROBLEM BACKGROUND

During the 2018-2019 academic year SACC had 6433 students enrolled. 3,473 (54%) took courses online. Out of the remaining 2,960 (46%), 2,452 were enrolled in technical courses that required students to attend in-person and for which an online option was not possible. The online mode had surpassed on-campus in terms of total enrollment. Previously, the college has operated around on-campus courses but move to online has forced the college to address how the different learning modes match up. Since online courses now contribute to a large portion of the college's tuition revenue, performance in those courses takes on a different level of importance. SACC needs to ensure that students are successful in the online mode to guarantee future enrollment and secure state funds.

Given the costs of not producing successful online students, it is of great importance to the college to provide the best online course possible. This requires support from all parts of the college. But most importantly, it requires the support and assistance of the faculty. These personal are charged with developing, teaching, and assessing the course. They play an important role in determining how successful a course, or mode, will be. At SACC the faculty, along with other college personal, have viewed the online mode with trepidation and have been wary of implementing it. They are unexperienced with the online mode and unsure on how to operate in the online medium. Their training and experience have led them to believe that the traditional on-campus mode is the best option. The online mode is unknown to many

faculty members, and they have struggled in developing online courses they fell are equivalent to their on-campus sections (Smith, 2010).

Data on student success is needed to assist them in determining what approach works best and becoming comfortable with teaching the online mode. Student performance data is required to evaluate existing course offerings. In the past, SACC has only used student grades to assist faculty and course design. The two modes have been compared to determine if a difference exists. This study will examine the grades from both modes to determine if the online and on-campus courses produce equal grades.

RESEARCH PROBLEM

The purpose of this study is to determine if online courses produce equal grad performance as on-campus courses. As the demand for online courses has increased so has the scrutiny (Spalding, 2017). While the issue of student performance in online courses has been a topic of interest, most of the research focuses on student motivation and the impact of technology on learning. Few studies have attempted to determine if online grades match those of on-campus courses. The success rate of online courses also possesses issues for college funding as states have begun implementing performance-based funding formulas (Smith, 2016). This study will compare student grades from a single academic year taken from different sections of English 101 writing offered via different instructional modes. The mean student grade from online and on-campus courses will be compared to determine if the course delivery modes are the same or different.

SIGNIFICANCE OF THE RESEARCH

The growing student demand for online courses has placed small, rural community colleges in a difficult financial situation (Wyllie, 2018). As more and more students flock to the online option colleges must respond by increasing the number of online courses and programs. To meet budgetary needs colleges must offer modes of instruction that conform to student desires. Online courses are no longer a small portion of course offerings and threaten to become the dominate mode of instruction (Lorenzo, 2010). State and federal governments, the dominate source of college funding, have begun to require colleges to demonstrate proof of academic success (Ung, 2015). The course success rate is now linked to a percentage of the college's total funding.

In 2016 the state of Kentucky General Assembly, on recommendation from the Postsecondary Education Working Group, passed KRS 164.092 implementing a funding formula for all the state's public higher education institutions (Kentucky Council on Postsecondary Education, 2016). The law was passed in response to legislative to determine how the state can best fund public postsecondary institutions in the state. The new funding model was intended to correct shortcoming in previous funding methods and address the how the state could best use funds to achieve state higher education and vocational goals. A percentage of the state's funds is now tied to how the higher education institution performed academically. Academic success rates are not directly linked to a percentage of state funds that a higher education institution receives.

To achieve full funding, the institution must achieve a defined success rate among students enrolled in all mode of instruction. Online education is a relatively new mode of instruction for many faculty members who were educated using the lecture based F2F method and are skeptical of the online modality and need additional information before they buy into the new mode (Gregory, 2018). They are more comfortable with the face-to-face mode. Therefore, it is important to identify how students are performing and what instructional modes are the most effective. The purpose of this research is to determine if the online mode of learning provides the same level of student success as the on-campus mode.

DEFINITION OF TERMS

This study focuses on rural community college students who are pursuing a two-year degree or training certificate at Southeast Appalachian Community College (SACC) during the 2017-2018 academic year. The terms are broken into two groups: national (terms more common in research) and local (used at SACC).

The first set of terms we will explore at those used in national research. **Online Course** is an academic course where all aspects of the teaching and assessment are done using the Internet (Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, & Liu, 2006). No on-campus contact takes place between student and instructor. Coursework can be completed at any time and in any location. This is the opposite of **Face-to-Face (F2F)** courses where all course activities are done on-campus and organized around scheduled course meetings in a physical location (Tallent-Runnels et al., 2006).

The terms synchronous and asynchronous learning will be used in the discussion of quality and need to be defined. **Synchronous learning** is education in real-time (Ceja, 2007). Both instructor and students are engaged in the learning process at the same time. The opposite, **asynchronous learning**, is a method of learning where learners participate are not learning at the same time (Ceja, 2007). Learns are free to choose when they will participate in course activities and are not required to meet a predetermined time and place.

The remaining terms are course related and specific to SACC. The terms used may be like those at other colleges. **Mode** refers to where student learning will take place (online or face-to-face). Course mode will be used to identify sample groups. At SACC mode is divided into WWW (World Wide Web) and In-Person sections. For this study, I have converted WWW to online and in-person to face-to-face so that the terms may be easily recognized by a national audience. **Course Grade** is the letter grade issued to the student upon completion of the course. Course grades will be converted in a value for course comparison.

For this study, **Academic Success Rate** will be defined as the percentage of students in a course that earn a grade of D or higher. The rate is calculated by totaling the number of students who earned a grade of D or higher then dividing that number by the total number of students who completed the course. This term is a local one developed for this study to identify the students who complete a course and can apply that course to a degree.

SUMMARY

The emergence of online learning has profoundly altered the way higher education institutions operate. Traditionally, students were required to physically attend higher education institutions if they wished to obtain higher education. All aspects of the course would be conducted under the watchful eye of an instructor. But propagation of the internet along with student demand has produced a new method of leaning. One that rural institutions of higher education perceive as method of growing both revenue and enrollment.

Adopting this new learning method will require colleges to be vigilant on how students perform in courses as staff struggle to deal with student demand, budgetary concerns, faculty preparation, and a lack of student high-speed. Rural community colleges must balance strategical goals with financial needs. The addition of state performance-based funding models has also been a concern. Student grades are now tied to a portion of the college's total funding. Even a small loss in revenue could be catastrophic for a small rural community college dependent on online courses.

My study will compare the two learning modes to determine if a difference in grade attainment between the two modes exists. If online and face-to-face modes product equal grades, then it may alleviate some of the concerns held by college personnel. But if the modes produce unequal results it may greatly impact how online courses are offered.

CHAPTER 2

DEMAND FOR ONLINE LEARNING

The spread of online courses has been largely a result of student demand. Each year more and more students have embraced online learning and turned away from traditional face-to-face courses. The Babson Survey Research Group (Online Report Card, 2015) reports that more than 1 in 4 college students are enrolled in at least one online course. This represents a significant portion of the American college population. Recognizing a new opportunity, colleges were quick to adopt online offerings, ushering in a new era of students learning.

Previously, the only variables that changed in a course were time and location. Course content, methods of communication, and assessment mostly remained the same. Online courses challenges many of these concepts and forced faculty to look at teaching in a different way. For many faculty members the online mode of teaching was confusing and hard to implement. This differed from students who welcomed the new approach and saw it as an option to pursue education remotely. Online education allowed students to attend college in greater number than ever before (Ceja, 2013). The physical and time barriers that prevented students from attending college were now eliminated (Picciano, Seaman, Allen, 2010). Students needed only a computer and internet connection to obtain a college education. Within a few years online colleges appeared and a new form of education was born.

Since online courses are not geographically limited, the academic reach of each community college has expanded beyond their traditional boundaries (Ceja, 2007).

This has created an overlap over in-service areas as colleges began to compete with other institutions for student funds. Online education may have increased the number of students a college can serve, but it also increased the number of completers colleges must face. The competition for online learners has led institutions to develop online offerings that appealed to their target audience (Conway, Hatchey, & Wladis, 2012). Else, they would lose students to their online competitors.

Demand for online courses outpaced supply in many states as colleges rushed to fill perceived void (Green & Wagner, 2016). Speed was essential if the college wanted to obtain market share. Institutions needed online courses and they needed them fast. Online courses were perceived to be no different from other instructional modes such as night or weekend courses and began to use those offerings as a foundation on which they built their online counterparts. Course design was not considered an issue in the rush to fill student demand (Ceja, 2007).

In 2011, over six million community college students employed the online mode to obtain an education (Sheehy, 2013). This figure represents over 30% of the total number of community college students (Leaderman, 2018). With at least one in every three community college students taking an online course the issue of academic quality has grown. The growth of online learning highlights the need for flexible educational programs (Dendir, 2016). While online learning may have been perceived as a means or addressing the needs of non-traditional students, traditional students have begun to seek out this option as a means of obtaining an education.

While students may perceive online courses as a viable option there are others who do not share their opinion. Employers are often the final arbiter in deciding if an educational credential is valid. In a 2013 conducted by Saad, Busteed, and Ogisi employers reported that 49% of those survey believed that online courses were not the equal of face-to-face courses. The report also indicated that employers felt online course to be of less quality and grades earned in those courses could not be trusted. Since employers control access to employment, they are the gatekeepers determining employment. Therefore, their opinion is of great importance. Menachem Wrecker (2012) reports that online MBA students could face great challenges in finding employment. Wrecker suggests that the reputation of online programs could be detriment to new graduates seeking employment at premiere companies.

Therefore, students need to be aware of perception and seek an education that is valuable to the employer. In 2013, Devon Haynie reported that employer perceptions of online degrees had improved. However, employers still place a higher value on face-to-face programs. Haynie states that in previous surveys employers had indicated that the perception of online degree was not strong. However, that view has changed. The willingness of employers to accept online degrees has led to a further increase in online study. Since online degrees no longer have a stigma attached to them, students are flocking to online learning in greater numbers. Leaderman (2018) whose work indicates that student demand for online courses has increased as online courses have become more mainstream supports the idea.

Despite the views of employers, students continue to seek online courses. According to Green and Wagner (2011), online enrollment grew 15% since 2010 and 2013 making online education a major mode of instruction. The increase in student demand has presented colleges with an opportunity. Answering the demand for additional courses, colleges have increased the number of their fully online programs (. Since 2002, the number of fully online programs has increased from 32.5 to 62.4 percent (Sheehy, 2013). As the number of online courses and programs has grown, so has the issues surrounding online education. Surveys of online students indicate that while they value online education, students do perceive an issue with the quality of online courses (McKenzie, 2017). Nichole Dobo (2017) reports that a 2017 survey of online students indicated that online students want more than just convenience. Online students have an invested interest in improving the quality of online education and they desire colleges to develop courses of high quality (McKenzie, 2017). Therefore, colleges have a vested interest in determining the quality of online course. If students believe that online courses are of lower quality, they may choose other educational options. Since online programs are available nationwide students have many choices.

Online learning can offer several benefits to small rural community colleges. The first, and for some the most important benefit, is financial. Rural institutions are facing several financial issues that influence their operations. A loss of population, declining tax revenues, and declining employment (Irvin, 2009) have driven rural community colleges to make drastic decisions concerning how these institutions will

operate in the future. These factors can weigh heavy upon institution administrators who must provide a diverse curriculum. Online learning seems an attractive choice for colleges that dealing with financial issues (Irving, 2009). The lack of adequate funding forces the institutions to look for alternative methods of providing instruction.

The lack of funding drives rural colleges to adopt online learning. Brain Bent's (1999) research into the cost effectiveness of ITV courses in small and rural institutions suggests that small course sizes impose academic limitations. The small populations of rural institutions are insufficient to produce the required number of students necessary to offer certain advanced courses. In short, the demand for advanced courses would be very small in rural institutions. The small number of students served by hiring a full-time instructor do not justify the cost associated with developing and scheduling the course. The additional staffing costs can present a problem to rural institutions seeking to provide more than basic courses to their community.

To balance their long-term financial commitment with their academic mission, rural colleges have begun seeking a method that will allow them to overcome these funding obstacles and still provide students with an opportunity to achieve their academic goals (Picciano et al, 2010). However, in their rush to maximize their revenue potential colleges may have ignored the quality issue. Liest & Travis (2010) indicate that online courses can reduce some of the costs associated with attending college. Nevertheless, they also warn that colleges adopting online courses inherit a new set of costs, design costs. Developing online courses requires These new costs must be evaluated and understood before making the decision to add online learning courses

to their curriculum (Lorenzo, 2018). Additionally, the costs of training and maintain qualified online faculty members be included in the cost of providing online courses (Smith, 2010). Rural community college need to examine all the possible implications before incorporating online into their curriculum.

However, the demand for online education is not limited to students. College administrators from across the United States have begun to advocate for online education as a solution to their financial and academic needs (Ceja, 2007). Educators from both urban and rural colleges are casting expectant eyes toward the treasures that online education may bring to their institutions. They see this new medium to expand their institutional reach and obtain new sources of funding. As tuition cost rise, colleges face growing criticism over high tuition costs (Irving, Hannum, de la Varre, Farmer, & Keane, 2012). To offset criticism, colleges have pursued online learning to provide new funding sources.

Allen and Seaman (2008) survey of faculty and administrators support the economic motivations for pursuing online courses. The authors also report that community colleges have experienced the largest amount of online growth. Their study shows that community colleges account for nearly 37% of the nation's higher education population. However, when Allen and Seaman examined the total of online students, they discovered that community colleges account for nearly half of the nation's online students. Doug Lederman's (2018) research supports that of Allen and Seaman (2008). He reports that over 30% of all community college students are taking

an online course. Community colleges recognizing the financial advantage of offering online courses have raced to expand this offering.

ONLINE LEARNING IN THE UNITED STATES

In 2010, 29% of all K-12 students in the U.S. used online learning courses to obtain an education (de la Varre, 2010). During the 2005-2006 institution year more than 700,000 students were served using online learning. By 2009 this number had increased to over 1 million (Picciano, Seaman, and Allen, 2010). This encompasses a large student population and is expected to continue to grow. Picciano (2010) predicts that by 2016 K-12 enrollment could reach between 5 and 6 million. Picciano's prediction would prove to be highly accurate as online learning in the United States continued to grow over the proceeding years. By 2016 over 6 million students were enrolled in at least online course and made up 31.6% of the student population (Garris & Fleck, 2020).

As institutions rushed to accommodate the demand for the online instructional mode, they encountered new levels of scrutiny for the new medium. Faculty members began to question if the success rates in online courses were the same as face-to-face courses (Barber, 2011). Garris and Fleck's (2020) research concerning online instruction reveals that some studies demonstrated that online courses had a higher dropout rate than face-to-face courses. This information conflicts with data collected by others showing greater online student satisfaction rates (Glover, 2012) and increased support from academic leaders (Allen, 2016). The conflicting information

makes it difficult for institutions, students, and government agencies to determine if the online mode is successful.

As the demand for online learning courses continues to increase institutions must determine how online learning can (or should) be implemented. For many higher education institutions, this decision is based upon two factors: student demand and finances (Cejda, 2007). If an institution determines that demand for a mode exists, they must examine the qualifications and availability of current faculty to determine if they can meet the demand (Hart, Friedman, & Hill, 2018). The student demand must be weighed the resources required to offer the course. To be cost effective the cost of offering the course must at least be equal to the revenue generated by the course (Austin, 2010).

Insufficient staffing is a common problem among rural colleges and universities (Hannum, Irvin, Banks, & Farmer, 2009). As these institutions seek to provide in-demand courses and programs to their populations they frequently encounter cost issues associated with offering low enrollment courses and programs (Jenkins & Belfield, 2014). If the institution has sufficient staffing for the position, they could be able to address the associated costs with offering low-demand courses and programs with local resources (Jenkins, 2014). However, if the institution does not possess the required faculty they must determine if the institution can provide the educational opportunity to the students. Since rural institution leaders operate with scarce financial resources, they must be very cautious in how they allocated funds (Chalker, 1999).

According to a study conducted by Picciano (2010) the rational for using online learning courses varies from institution to institution. Each institution chose online learning based upon the unique needs of specific institution groups. For most institutions, the choice of online of face-to-face is based on student need for academic flexibility in how they take courses (Glove, 2012). These students are interested in taking courses that do now interfere with work and/or provide lower costs (Davidson, 2015). Staying at home and/or working allows students to reduce their educational costs.

Online learning may have begun as an option for working students, but the cost benefits of not living in a dorm has attracted students to the online mode (Hoffower, 2018). Demand for the online mode has resulted in higher education institutions expanding the offering to a wider population (Glover, 2012). As the student has increased, college and university leaders have begun to view online offerings to reach additional students and new revenue streams (Jenkins, 2014). In the pursuit of additional revenue, institutional leaders have been willing to expand their online course offerings (Green & Wagner, 2016). Institutions are now offering complete degrees using the online mode.

But online offerings are not limited to those courses required for a degree. There is a growing demand for using online learning to address remedial courses (Claire de la Varre et all, 2010). This is an important change. Initially, online learning was used to accommodate the needs of college-ready students, now online learning is being used to correct academic shortcomings for students wishing a higher education

degree. This is a shift from offering a course to a small, well prepared group to a larger group of students who may not be ready for online learning.

By adding remedial students to the online learning population institutions are enlarging the group online learning was meant to serve (Picciano et al, 2010). This is an important change since it alters the rational for using online learning. Rural institutions are no longer limiting online learning to just advanced courses not available at their institution. They are enlarging the online learning offerings to address other concerns. It appears they are now interested in using online learning to address student needs for any course. This expansion of online learning can have major implications for how institutions address curriculum design, scheduling, and funding.

RURAL INSTITUTIONS

Rural colleges serve more than 10 million students and account for over 30% of the overall public institutions in the United States (Irving et al, 2010). But despite their growing numbers, rural colleges are often underfunded and unable to provide their students with the same number of academic options as larger non-rural institutions (Hannum, 2009, Cedja, 2012). Despite appeals for community colleges to improve degree completion rates and improve vocational options, they continue to experience reductions in state funding and calls to be more accountable (Smith, 2016).

Yang's investigation into the impact of financial aid on degree attainment at rural community colleges (2016) suggests that rural community colleges are the dominate postsecondary education option for those living in rural communities and are responsible for meeting the vocational needs of the population. Yang also implies

that the lack of social and economic capital of rural communities can greatly impact degree completion rates. Students from rural communities often lack the funds required to attend a four-year institution and must find educational options closer to home. This idea is supported by Smith (2016) and Glover (2012) whose works indicate that students seek out the online mode to lower educational costs while allowing them to also be employed.

Yang (2016) and Glover (2012) also agree that the rural community college play an important role in their local communities. Rural communities often must deal with economies that are based on low to non-skilled labors and experience outmigration lessening their tax base (Yang, 2016). Economic realities force these students to adopt learning methods that fit their budgetary, academic, and scheduling needs. To address all these concerns, and to reduce costs, rural community colleges have sought out the online mode of instruction as means of achieving their strategic mandate (Smith, 2016).

Rural institutions across America face many challenges in their attempt to provide educational opportunities to their citizenry. These rural communities are often subject to geographic isolation and economic issues that prevent them from providing their populations with the same educational prospects available in larger communities (Smith, 2016). The lack of economic resources forces small rural institutions to adopt other measures to deliver a curriculum to their students which addresses their local and economic needs. Online learning (Hannum, 2009) has emerged as a means of addressing the woes of small rural institutions. Many rural institution districts have

rushed to adopt this new method of learning to alleviate the financial issues facing their communities.

The rational for implementing online learning in rural institutions mirrors those in urban and suburban areas but there are notable differences. Staffing issues in rural institutions can be more of an issue than in larger institutions (Ceja, 2007). Rural institutions often lack the financial resources to hire teachers for all the needed areas. Faculty for subjects such as math, science, and foreign languages are becoming difficult to locate and obtain (Liest & Travis, 2010). Larger institutions are more attractive to these teachers since they can offer higher salaries and more cosmopolitan working environments.

This has left rural institutions with academic shortcomings that must be addressed if they hope to provide quality education to their students. Since rural institutions lack the tax base of larger organizations, they are unable to offer the salaries required by high demand instructors. Unable to compete with large institutions, rural colleges are unable to obtain qualified instructors for critical areas (Gregory, 2018, Barber, 2011). Therefore, some rural institutions have turned to online learning hoping that the mode may allow them to address instructional needs by either outsourcing the course(s) to other institutions or using part-time faculty to supplement course offerings (Hoyle, 2010).

Lacking appropriate academic and financial resources, rural institutions are being asked to accomplish more with less (Austin, 2010). As the number of working

students seeking college education grow, rural institutions must address how they can meet the vocation needs of students within their budgetary constraints (Green, 2016).

With more than 10 million students in rural institutions (Irving et al, 2010). This number constitutes more than 30% of all the public institutions in the United States. When we take a closer look at rural institutions, we find that 50% of all rural institutions have less than 400 students. The small student population reflects the community the institution serves and limits the number of students an institution can physically reach (Hannum, 2009). Face-to-face courses have a limit on the number of students that be served. Online courses do not have this limitation.

Therefore, community size can impact the online learning decision. Institutions reflect the community they serve and communities with small populations will not be able to produce the tax revenues required to obtain teachers to address a diverse number of academic areas (Chalker, 1999). The costs associated with hiring these professionals can be higher than the institution can afford. This makes online learning courses very attractive to small institutions (McKenzie, 2017). Additionally, rural community colleges can choose to offer the online course to other colleges. This allows them to export online courses and obtain revenue. Hoyle (2010) and Barber (2010) suggest that the use of part-time faculty by community colleges can further enhance online profitability.

When online learning is examined, the process is normally viewed t. An institution can receive and/or provide online learning courses to other institutions. This may be true of larger institutions, but small institutions are most likely to

consume online learning courses instead of producing them. This creates a relationship between larger and small institutions. Larger institutions have the staffing to offer online learning courses needed by the smaller institutions. The smaller institutions may also be able share the staffing costs allowing them to work together in creating online learning courses. If the district is unable to subsidize the cost, then it can be spread out over other districts.

Throughout America rural education institutions are being asked to provide adequate learning opportunities while being mindful of the cost involved in providing those opportunities (Smith 2016) Money is the heart of this complex issue. To provide a diverse set of academic offerings the institution must be able to employ a wide variety of teachers across many disciplines (Hart et al, 2018). However, Smith (2016) maintains that the financial costs associated with keeping sufficient faculty on staff would require personnel budgets that rural institutions cannot sustain. Smith (2016), Adam-Turner & Burnett (2018) echo this belief and go farther saying that the adoption of online courses and/or programs needs to be included in the institutional operations plan. By including online into the institution's strategic planning, rural community colleges can identify budgetary needs and properly plan on how to implement an evaluate online offerings.

Funding is an important issue for rural community colleges. If the institution is unable to secure the funding necessary to hire and keep qualified personnel, the institution may be required to consider other methods to address student demands. Institution leaders must balance the needs of their students with the available funds

(Farmer, 2009). Academic offerings and funding appear to be at odds with one another. How can small rural institutions provide a diverse academic curriculum for their students when they do not have the funds? For many institution administrators this is a challenge like no other. They are constantly asked to do more with less which has led to serious academic issues that must be confronted by institution administrators (Smith, 2016).

Online learning can offer several benefits to small rural institution systems. The first and, for some, the most important benefit is financial. Rural institution districts are facing a loss of population, declining tax revenues, and declining employment (Irvin, 2009). These factors can weigh heavy upon institution administrators who must provide a diverse curriculum. online learning seems an attractive choice for institution districts that are dealing with institution closure or consolidation (Irving, 2009). The lack of adequate funding forces institutions to look for alternative methods of providing instruction.

The lack of academic preparation on par with suburban peers also presents an issue for rural students. If the institution cannot provide them with the knowledge and skill sets required in today's economy, they will be unable to compete in the job market (Gonzales, Jones, and Ruiz, 2014). If their poor academic preparation prevents them from obtaining high paying jobs, they will not be able to contribute to their community's economy. This compounds the institution funding issue since they are not contributing to the tax base.

It is the lack of funding that drives rural institutions to adopt online learning. Brain Bent's (1999) research into the cost effectiveness of offering non-traditional courses in small and rural institutions suggests that small class sizes impose academic limitations. The small populations of rural institutions are insufficient to produce the required number of students necessary to offer certain advanced classes (Smith, 2016). In short, the demand for advanced classes would be very small in rural institutions. The number of students who would be served by hiring a full-time instructor do not justify the cost associated with developing and scheduling the course. The additional staffing costs can present a problem for rural institutions seeking to provide more than basic courses to their community.

The financial implications of hiring additional teachers cannot be overlooked. There are short-term and long-term implications involved when an institution hires a teacher. The demand for a particular course can be transitory and change over time. This academic need based on short-term demand by very limited number of students. But the institution may not be able to locate an instructor willing to teach for such a limited time. Consequently, the institution system must incur a long-term cost if they wish provide students with this option.

To avoid this long-term financial commitment rural institutions are seeking a method that will allow them to overcome these funding obstacles and still provide students with an opportunity to achieve their academic goals (Picciano et al, 2010). However, rural institution must be careful when making the decision to add online learning courses to their curriculum (Emerson et al, 2011). There are costs involved

with implementing these courses that may be unknown to rural institutions. They need to examine all the possible implications before incorporating online learning into their curriculum.

Cost efficiency is not the only reason for rural institutions to consider using online learning. There are also academic reasons. Thomas Farmer's (2009) research on technology and online learning suggests that online learning can have a positive impact on learning. Farmer (2009) also postulates that the asynchronous nature of online learning is superior to the synchronous nature of face-to-face learning. However, Farmer (2009) also suggests that while students may learn better using the asynchronous methods of online learning K-12 students still need the structure of traditional classes to be successful. These findings only serve to strengthen the argument for rural institutions to implement online learning.

When considering the impact of online learning on rural institutions the views of those involved in the process must be considered. How students, teachers, administrators, and community members all perceive online learning must be considered (Irving, 2010). For the method to be accepted by rural institutions all the involved partied must have voice in the process (Chalker, 2002). This is essential part of rural communities where people have a more direct relationship with those in educational leadership. Institution leaders need to convince the residents of the community that this approach is needed and practical.

Irving (2010), Hannum (2009), and Cedja (2012) have tracked the growing demands for online options since 2002 and have warned that the growing number of

students pursing that option may strain institutional financial and academic resources. Green and Wagner (2016) warn that trustees should be cautious when choosing to implement online offerings. They suggest that possible financial rewards may be coupled with course quality issues. Such issues could result in lower success rates which could cost more to correct.

Irving, Hannum, de la Varre, Farmer, and Keane examine the perspectives of rural institution administrators and determined that the views of institution leaders concerning the use of online learning is highly skewed (2009). Their study on administrator's satisfaction with online learning reports that respondents indicated to be either very satisfied (45%) or somewhat satisfied (42%) with online learning. The level of satisfaction among administrators was linked to the number of students who took and completed an online learning course. The views of rural administrators are critical since it is the leaders who are responsible for developing plans and implementing them.

While online learning may appear to be the answer rural institutions are seeking. There are some issues that may inhibit them from implementing online learning plans. online learning can offer rural institutions' options, but there are costs involved with pursing those choices. Therefore, the use of online learning should not be entered into lightly. Online learning is a new medium and there are still many facets of online learning that remain hidden. Scrutiny by all the involved parties is suggested before adopting this practice.

Despite the fact online learning may provide rural students with access it does not guarantee academic success. Irvin, Hannum, Farmer, de la Varre, and Keane (2009) report that of online learning students in small rural institutions fail to complete courses. This can be a serious issue for small rural institutions who are hoping that online learning can provide them with relief. Failure to complete a course is a serious issue. Especially for rural institutions who hope to use online learning to offset instructional costs. If 50-70% of students taking an online learning course are not able to complete it the institution loses the funds allocated to that course.

The high non-completion rate among online learning courses has led researchers to examine online learning completion rates to identify the cause of this issue. Both Thomas Farmer (2009) and Matthew Irving et al (2010) have identified student preparation as a possible reason for such a high failure rate. Some researchers suggest that a lack of exposure to technology may be the reason for students not being prepared for online learning courses (Picciano et al, 2010). In 1983 the student to computer ratio was 125:1. By 2004 that number had lowered to 4:1 but has not lowered any more. While institutions have invested heavily in technology (10 billion per year) it does not appear to have the desired effect on faculty and students.

Irving et. al. (2010) proposes the use of facilitators to assist students with technological and learning issues, but hiring facilitators requires additional funding (Irving, 2010). This may make the use of online learning less attractive to rural institutions trying to lower educational costs. If they were able to hire additional personnel, they would not need online learning courses. This can make online learning

less attractive for some rural institutions. online learning is not the static entity many perceive it to be. This approach can have additional fixed costs the institutions many may overlook when they are examining online learning as an acceptable alternative (Dendir, 2016). To implement and maintain online learning courses the institution must be prepared to accept additional costs as part of offering a course that is not based on face-to-face instruction.

The financial and instructional costs involved in offering an online course could be an issue for rural colleges and must be considered a barrier for those wanting to implement online learning as an educational option (Jenkins & Belfield, 2014). Austin (2010) warns that online courses require course facilitators who are skilled in the techniques to create and maintain online courses. This cost not present in face-to-face courses and often overlooked by institutions (Barber, 2011).

Teachers are content experts not course designers. They often lack the technical skills and knowledge required to develop quality online learning courses. Since online learning courses rely on computer-based training the role of the designer in course development is essential (Irvin et al, 2009). The asynchronous nature to the course minimizes face-to-face contact between student and teacher resulting in a higher demand for course quality. This type of quality can have a high price. Not only are designers needed to work with teachers in developing course content, but they must remain available for course maintenance and improvement. Each online learning course requires a developer, a facilitator, and an instructor. That is a 3:1 personal to course ratio. Currently, each face-to-face course only requires one instructor.

Therefore, accepting online learning courses also means accepting the additional personnel requirements.

Another issue associated to the use of online learning in rural institutions is internet access. While broad band internet may have penetrated urban and suburban areas, rural locations are still experiencing a digital divide (Cejda, 2007). Rural institutions experience lower levels of access to high-speed internet (Irvin, connection to the larger world). This issue is possibly the biggest hurdle in implementing online learning in rural institutions. With less than 20% or rural residents having access to broadband (high speed) internet rural students may not be able complete assignments from any location other than institution. This places a time limit on student work and can affect course completion.

THE DIGITAL DIVIDE IN RURAL AMERICA

The digital divide among the American populace makes it difficult for rural groups to access online offerings. The lack of internet service providers (ISP) in rural sections of the Unite States creates a technological barrier for many rural Americans and limits their ability to access the type of education they desire. According to Brent Cejda (2007) less than ¼ of rural residents have access to broadband internet. The remaining population either has no internet or are forced you use connections with narrow band speeds. Cejda (2007) postulates that this situation may be a result of age. Rural communities have a larger percentage of older adults (46%) than their urban counterparts (38%). In rural areas older adults may command much of the monetary power in the community. Since they are not interested in having internet

access this means that ISPs are less likely to enter a market reducing access. Small rural populations do not offer high revenue streams for internet providers to consider offering broadband access.

Hegwer (2020) reports that nearly one-quarter of Americans believe that access to high-speed internet is a problem. This information matches earlier work by Hart in 2018. While the rest of the nation experienced a growth in high-speed internet, rural communities continued to suffer. Households with less than $30,000 a year income were the most likely group to suffer (Hegwer, 2020). The poorer sections of the population are being prevented from accessing the means that will elevate them out of poverty.

The digital divide was most evident in 2020 when the COVID-19 virus caused schools across America to close (Riley, 2020). All educational levels were forced to move to online learning to lessen the spread of the virus. This move left millions of students without educational options as they struggle to deal with poor internet connections, working from home, and institutions that were not prepared to deal with the shift to online learning (Anderson, 2020). Riley (2020) suggests that students from minority groups are at the greatest risk since the impact of the virus has impacted them more.

As American education dealt with the challenges of online learning, parents were left wondering if the online mode could tackle the instructional challenges posed by COVID-19 and prepare their children as well as face-to-face instruction. Now, online learning would face its greatest challenge to date as students across America

went online. Course quality became a nation issue that had to be addressed quickly as states and educators rushed to find a viable solution to the problems brought about by COVID-19.

A poll of COVID-19 college students revealed that 63% of those surveyed believed that the quality of instruction has gotten worse since moving online (Garris, 2020). Reports such as these have had understandably negative impact on the perception of online learning. As students were forced to move to online many educators fear that online learning may to adequate to address the needs of students and an achievement-gap may arise because of moving to the mode (Riley, 2020). This sentiment is shared by Anderson (2020) who believes that the achievement gap between middle- and low-income students will rise during the pandemic. Students form middle income families are more prepared to deal with the pandemic, while low-income families lack the resources to address the challenge (Hegwer, 2020).

COLLEGE FACULTY AND INSTRUCIONAL QUALITY

College faculty play an essential role in developing, teaching, and evaluating courses (Gregory,2018). According to Barber (2011) faculty members, along with college staff, are ultimate arbiters of course quality. Faculty views on courses are valued by students, community members, and legislators. However, faculty are not of one mind about online learning. Prior to COID-19, educators were struggling to determine if online learning was of equal quality to face-to-face learning (McKenzie, 2017). The new method of teaching and learning has been a challenge for educators who continue to struggle with how to develop quality online teaching methods.

While opinion among faculty member differ, when senior educational administrators were asked about the quality of online learning 70% felt that online courses were inferior to face-to-face courses (Allen, 2016). This is a major obstacle to the acceptance of online learning. With such a high number of senior educational leaders believing that online learning is not a quality product how can they convince the communities they serve to accept them? It is critical for online learning to be accepted by those it will serve, and if the community does not view this style of teaching as a quality product, then they may not endorse its use and rural students may face a lack of educational opportunities as they attempt to balance employment, education, and funding (Garris, 2020).

STATE FUNDING

Colleges obtain revenue from a wide variety of sources. However, the three most significant contributors are the federal government, state government, and student tuition (Chappell, 2015). According to research done by the Pew Charitable Trust (Federal and State Funding, 2015), federal and state funding accounts for over 37% of college revenue with states contributing the large portion at 21%. Revenue from student tuition accounts for another 21%. These figures are supported by research from Chappell (2015). But as states struggle to address revenue shortfalls these percentages are likely to change. Economic change can also be a result of environmental changes such as the 2020 COVID-19 pandemic.

Historically, states have contributed the most to college coffers (Woodhouse, 2015). But over the last decade state funding has declined as states deal with internal

revenue issues (Chappell, 2015). Kellie Woodhouse (2015) reports that prior to 2012 states spent 65 percent more on higher education funding then states breaking a long funding trend. According to Woodhouse (2015) and Chappell (2015) federal revenue has surpassed state revenue contribution. Kentucky state economic data suggests this trend will continue in the foreseeable future (Sonka, 2017).

Over the last twenty years college enrollment has increased as funding for Pell Grants has increased (Woodhouse, 2015). As college enrollments have increased so have costs. Colleges were not prepared to deal with the enrollment changes and needed to expand their operations to deal with the increase in students. These changes required money that the colleges did not have. Therefore, colleges raised tuition to obtain the needed revenue.

Colleges are facing a major threat to how the operate. Rising enrollment coupled with diminishing state revenues has college administrators struggling with financial issues. Over the last ten years colleges have addressed financial issues by raising tuition. But this approach has practical limit. The three entities providing funds for paying tuition are suffering from sticker shock as college tuition has skyrocketed. Students and governments are beginning the question if tuition increases are really needed.

Rural institutions across America face many challenges in their attempt to provide educational opportunities to their citizenry. These rural communities are often subject to geographic isolation and economic issues that prevent them from providing their populations with the same educational prospects available in larger communities.

This inherent lack of economic resources forces small rural institutions to adopt other measures to deliver their students a curriculum that addresses their local and economic needs. Online learning (online learning) has emerged as a means of addresses the woes of small rural institutions. Many rural institution districts have rushed to adopt this new method of learning to alleviate the financial issues facing their communities.

Therefore, it is essential that educational leaders work with community members to develop a plan on how online learning should be implemented (Chalker, 1999). The financial cost of using online learning is most likely beyond the reach of most institution districts. This means rural institution need to establish working relationships with parties that can supply the needed funds. Generating political support for online learning could lead to sources of funding (Deggs and Miller, 2011). This requires institution leaders to work with all government and non-government agencies to obtain the needed funds.

The problems confronting rural institutions are profound and while online learning many are not the answer to all the issues confronting rural institution, they can deal with some of them (Smith, 2016). Institutions should not enter online learning blindly. But before online learning can be implemented the involved parties need to first realize the benefits involved with using online learning and determining whether those benefits are worth the costs. In short, what can online learning do for your institution and what are you willing to pay?

The pertinent question for most is what can online learning do for a rural institution? While money is an attractive motive, the best motive for offering online is access (Adam-Turner, 2018). But this access is not cheap. When an institution decides to develop online learning courses there are costs involved that cannot be avoided (Smith, 2016). Leadership in the rural institutions must identify and accept these costs if they want to be successful (Austin, 2010). Unless they enter this decision blindly not knowing all the facts. This will greatly inhibit their success and produce negative feelings by both faculty and leaders.

But many of the costs involved with online learning cannot be easily identified. This technology is very complex, and the costs can be hidden. Educational leaders, teachers, and the community they serve were not prepared for this new technology (Smith, 2016). More research needs to be done on this issue. online learning is another tool in the teacher's instructional bag. However, it is a tool that requires a group to use effectively. In the past the teacher created and taught the course curriculum but with the invention of the internet this has changed (Smith, 2010). Now, others are needed to develop the course. These additional costs may be beyond the financial resources supplied to the rural institutions.

In the end, the issue comes down to money. If the rural institutions had the resources to hire additional teachers, they may not be investigating the use of online learning. But it is a lack of funds coupled with need to provide an economic future for their students has led rural institutions to this decision. Since money brought rural institutions here, we can assume that money will be the factor that determines if

online learning will be used. If the cost of online learning courses is less or equal to that of a face-to-face course, educational leaders will be more accepting of online learning.

But where will the money for online learning come from? Rural institutions are facing severe financial issues. Their tax bases are not sufficient to fund additional positions (Lorenzo, 2018). So, where does the money to pay for online learning come from? Many of the rural communities are facing economic issues of their own and may not have the funds for the institution. If rural institutions are unable to get the community to provide additional funds they must reach out to federal and state agencies (Smith, 2016). But even if the institution obtains the funds they come at a price. To this point I have only mentioned the monetary cost but there is another. There is a cost to our students if we fail to act. Therefore, it is up to the state and local community on how best to proceed with online learning. The costs of using online learning may be high but the costs to our students may be higher if we do not.

Therefore, it is essential that educational leaders work with community members in developing a plan on how online learning should be implemented (Chalker, 1999). The financial cost of using online learning is most likely beyond the reach of most institution districts. This means rural institution need to establish working relationships with parties that can supply the needed funds. Generating political support for online learning could lead to sources of funding (Deggs and Miller, 2011). This requires institution leaders to work with all government and non-government agencies to obtain the needed funds.

This is the political dimension of online learning. Rural institutions need to convince others that supplying them with funds is a benefit to not only the institution, but to themselves through jobs. Institutions are trying to link online learning courses to enhanced economic benefits (Gonzales et al, 2014). The absence of the online learning course be perceived as denying students economic benefits. By working with leaders in the community institutions can garner political support for developing online learning courses. This means educational leaders can and should provide community members with accurate information concerning the costs and benefits of online learning (Lorenzo, 2018). Once the community members have the information they can decide if the option is a benefit to their community. Only by working in unison can institution officials and community leaders hope to develop a plan of action that will benefit the students.

As states continue to lessen the about spent on education, college have looked to online courses to provide make-up for lost revenue (Liest & Travis, 2010). Both urban and rural colleges have begun to incorporate online education into their academic offerings to entice students to their institution. Even those colleges who do not favor online education have considered adopting online offerings to stay competitive (Ceja, 2007). The desire to remain academically completive with other colleges, coupled with need to find additional revenue streams, has forced colleges to incorporate online learning into their academic offerings. Over 75% of community college administrators agree that they are in competition with colleges offering online

courses (Allen & Seaman, 2008). Community colleges are not only in competition with other community colleges but with all higher education institutions.

While college administrators from all parts of America are embracing online education, small rural colleges are facing difficult questions concerning online learning. These small institutions, such as community colleges, often lack the financial resources of larger urban areas and must operate on much small budgets (Leist, J., & Travis, J. (2010). Smaller budgets equate to fewer academic programs and services. However, those they serve still demand that these small institutions provide similar educational opportunities as larger colleges but at lower rates (Ceja, 2007). This demand has placed small colleges in a serious bind as they strive to balance the educational needs of the community they serve with a tightening budget. The online course developments favored by Piña (2014) and Puzziferro (2008) may be out of the financial reach of many small rural community college.

The issue of balancing production with funds is not limited to higher education. In the field of management there exists a concept known as the Project Management Triangle (Westland, 2018). The Project Management Triangle is tool used to balance the cost, scope, and time variable associated with developing any project. Many of us may have heard the concept stated as "you can have it cheap; you can have it good; you can have it fast. Pick two." The tool helps illustrates how the three constraints can be manipulated to achieve a particular outcome. When this process is applied to online course development, we find that cheap and fast are the variables of most

concern to colleges and students. In turn, student success in those courses also suffers.

Jaqueline Pitts (2020) reports that in Kentucky, college funding has decreased 1.9% over a five-year period. Such reductions can hamper how college operations and present financial challenges. In testimony given to the Kentucky House Budget Review Committee on Postsecondary Education, Pitts relates Counsel on Postsecondary Education (CPE) President Aaron Thompson's view postsecondary needs more funds to ensure that college tuition remains affordable. If a college fails to meet certain metrics, it could face negative financial repercussions. As state funds decline, colleges are forced to raise tuition to make-up for lost revenue. In 2019, six of Kentucky's sixteen community college received no performance-based funds (Spalding, 2019). Needing funds, colleges are forced to raise tuition to counter the loss of state funding. (Lorenzo). Increased tuition could place college out the reach of many students.

While colleges wrestle with the financial issues involved performance-based funding, the demand for online courses continues to rise. Students want courses now. They are not prepared to wait for colleges to develop courses that are of high quality (Yang & Cornelious, 2004). Therefore, this variable becomes a constant and colleges must manipulate the other variables. Colleges entered the online environment to increase student enrollment and raise revenue. Therefore, cost becomes a constant as well. This leaves quality as the only variable for manipulated. If colleges wish to improve quality one, or two, of the other variables must be adjusted. Since students are the target audience for the online product, they have a large say in what variables

will be adjusted. While students may be concerned with quality (Dobo, 2017) they do not want to pay more or wait for online courses (Dobo, 2017).

Work by Liest & Travis (2010) shows that community college leaders are very concerned with the economic advantages of online learning. Online learning allows small colleges to offer courses, and academic programs, without hiring full-time faculty (Barber, 2011). Full-time faculty are paid a salary and benefits. The cost benefits of employing adjuncts can be immense. Therefore, rural colleges can hire adjuncts to fulfill short-term academic goals without obligating the college to a long-term financial burden (Ceja, 2012). Rural colleges are also able to address shortages in key academic areas using adjuncts. Colleges have the financial and academic flexibility to offer courses as needed. This approach allows college administrators to offer online courses at a reduced cost.

Since community colleges rely on state and federal funding for a significant portion of their operations, they must comply in the success mandate or loose funding (Tack Force, 2012). However, mandating success and producing success are not the same thing. While state and federal governments have begun to mandate that colleges develop and implement quality measures that produce student success (Schray, 2006), these measures have not been welcomed by those who must create and deploy them (Cejda 2012). Institutions have a stake in maintaining their academic appearance and can be slow to accept new accountability methods (Picciano et al, 2010).

As states have decreased their level of college, funding colleges have rushed to identify new sources of revenue to counter the loss of state funds (Seltzer, 2018). According to Seltzer, not only must community college deal with a loss of state funds, but they must also deal with declining enrollment. Seltzer also suggests that a lack of fiscal capability (tax revenue) may be reason states have failed to fund higher education at higher levels. As funds, decline quality also suffers. Cheves (2018) and Lorenzo (2018) also agrees with Seltzer. According to Chaves, declining enrollment and reduced funding has hampered college operations. The author reports that between 2008-2013 tuition at Kentucky state colleges increased 50% while state funding continued to drop. Continued defunding of colleges will only increase the cost of tuition will prevent low-income students from attending college (Davidson, 2015). Hillary Hoffower (2018) suggests that decreased state funding has resulted in an increase in student debt.

George Lorenzo suggests that since the 2007 Recession states have been in a process of defunding higher education. Yearly cuts to higher education spending have left community colleges in a state of transformation. According to Lorenzo, state disinvestment is still ongoing. In his Facing the Future: State Funding of Community Colleges, Lorenzo asserts that states have ignored their commitment to funding community colleges to reduce state expenditures. As of 2017, state funding for community colleges remains below the 2008 levels. This movement has left community colleges unsure what next year's budget will bring. Financial instability has had a profound impact on community college operations.

Reduction in funding, coupled with declining enrollment, has forced community colleges to turn to improved retention and persistence strategies to provide financial relief (Irving, 2010). In 2018, persistence rates at public two-year colleges were 62.7% (Lorenzo, 2018). Over one-third of community college students failed to progress in their degree path. State policy makers perceiving this issue as an indication of poor performance on part of the institution, have implemented outcomes-based funding to correct the problem.

In pursuit of economic stability, rural colleges are turning more and more to adjunct facility to ease the costs of providing instruction. Rural community college are unable to obtain faculty for in-demand positions for as math, science, and foreign languages since they are unable to match the salaries offered at larger institutions (Leist & Travis, 2010). Therefore, such knowledge experts are becoming difficult to locate and obtain. Larger institutions are more attractive to these teachers since they can offer higher salaries and more cosmopolitan working environments (Ceja, 2007). This has left rural institutions with academic shortcomings that must be addressed if they hope to provide quality education to their students. Since rural institutions lack the tax base of larger institution districts, they are unable to offer the salaries required by high demand teachers. Adjunct instructors allow small community colleges to offer a greater number of courses and programs (Hoyle, 2010).

Coupling online instruction with adjunct faculty seems to be an excellent method allows college administrators to reduce faculty cost while increasing student enrollment (Hoyle, 2010). Therefore, some rural institutions have turned to online

learning hoping that it may provide the answer to their economic problems (Liest & Travis, 2010). However, adjuncts may lack the training and motivation to be successful in online courses (Hoyle, 2010). Since adjuncts comprise of large proportion of online faculty this could influence course success rates.

Irving, Hannum, de la Varre, Farmer, and Keane's (2009) research demonstrates how perception of online can impact student success in the mode. According to the authors, the views of rural institution administrators altered depending on online success rates. Their study on administrator's satisfaction with online learning reports that respondents indicated to be either very satisfied (45%) or somewhat satisfied (42%) with online learning. The level of satisfaction among administrators depended on the number of students who took and completed an online course.

However, small rural communities are facing increasing financial burdens as student enrollment and state support declines (Irving, 2010). This presents community college leaders with serious financial and academic issues. They are required to operate using limited resources. These issues force colleges to make decisions based upon economic trends rather than academic outcomes. The issues of geographic isolation and limited resources could beyond control of small rural community colleges (Cejda, 2012).

COURSE SUCCESS

Previous investigations comparing online, and face-to-face instruction has yielded varied results. Research on the topic has focused primary on student

engagement and perception, not completion (Garris & Fleck 2020). Academic quality has been a function of student perception. Work by Garris and Fleck indicates that student perception, which is not a fixed value, can change and thereby produce different results. Research focused on perceived learning instead of actual learning. The changing nature of the subject being assessed has made it difficult to determine if the two modes produce similar results.

Prior to 2007, colleges faced little oversight how they spent state funds (Lorenz, 2018). Since then, more and more states have implemented performance -based funding to make colleges more accountable for the money they receive from the state. This has been a drastic change for many colleges. The amount of funds they receive is now tied to performance measures. Community colleges must prove they are achieving state mandated levels of success to obtain funding.

Course grades have long been used to determine if a student has been successful in a course (Drew, 2010). However, grades are not the sole determinant in defining success and can be misleading. A student can pass all the courses they attempt with a grade of D but not earn a degree since colleges require a C minimum overall GPA for degree attainment. This distinction can be lost on students and policymakers. The public must trust that the institution in engaging in a systematic process that will produce graduates that possess an acceptable level of knowledge in their stated field. A quantifiable measure is required to determine if a college succeeds (Schray, 2006).

According to Vickie Schray (2006) and Glenys Drew (2010) quality, and student success, are linked terms. Student success is the product of quality courses (Schray, 2006). If courses, both online and face-to-face, are developed using quality control techniques student success will be the result (Drew, 2010). This view is also shared by Maria Puzziferro and Kaye Shelton (2008) who define quality as process where all aspects of course operations are tested to determine if the course is accomplishing the goals stated in the course. Therefore, we can understand that course quality and student success are not static terms whose definition is shared by all institutions. Lacking a shared definition makes a comparison problematic.

When senior education administrators were asked about the quality of online learning 70% felt that online courses were inferior to face-to-face courses (Piciano et al, 2010). This is a major obstacle to the development and acceptance of online education. With such a high number of senior educational leaders harboring a negative view of online education, validation of online course success is needed. Further, the views of administrators can impact others at their institution (Barber, 2011). Data on online success rates is imperative to influencing opinion.

Since the meaning of quality and success can vary from institution to institution, the issue of academic success has been a topic brandied about by instructors since the dawn of education. While colleges have often touted their high levels of academic quality to an ever-demanding public who funds them, defining quality has been a problematic exercise for higher education institutions (Hart et al, 2018). State accrediting bodies have allowed these colleges to self-police themselves

on issues of academic success for many years (CHEA Institute, 2002). For some, course quality and success rates have a direct link. If a course produces prescribed level of grades, it is successful. This has been treated as article of faith among institutions who see no reason to doubt their product. However, this belief is changing. As the cost for attending college rises, the public demand for course success rates has increased (Mendenhall, 2013). Those that fund education seek proof that public funds are being spent wisely. They desire proof that colleges are operating in a manner that fosters learning. Federal and state governments are demanding colleges produce proof of their academic endeavors (Drew, 2010).

COURSE DESIGN AND SUCCESS RATES

Academic quality and success rates are often used interchangeably among college faculty as they discuss the topic of course performance. While Ceja (2007) suggests that college often overlook design and focus on cost, that view was based on a time predating adoption of performance-based funding. Now, colleges are vested in insuring that students succeed at greater rates. The process of making sure success occurs often falls upon the faculty member.

Faculty are professionally vested in making sure that every course possesses sufficient academic rigor to prepare students for their chosen vocation (Barber, 211). However, the development of online courses has left many faculty members perplexed about this new mode of learning (Piña & Bohn, 2014). Using the Internet to provide academic offerings is a strange and unknown realm for many and they fear that the new modality may lack the academic rigor present in traditional face-to-face courses

and produce lower success rates (Hoyle, 2010). This uncertainty has prevented some faculty members from fully embracing the online mode and forced institutions to limit their online offerings.

Online education is a quandary to most faculty members. McKenzie (2017) reports that only 30% of the college faculty survey in 2012 indicated that they viewed online courses as a legitimate college offering. Other college faculty have stated that they believe the online mode to inferior to the face-to-face mode (Yang & Cornelious, 2004) echoes this sentiment. Faculty are now demanding that online courses come under scrutiny and improved if the college (Irvin et al, 2009) offers them. To improve faculty perceptions, college administrators have implemented better training programs to prepare faculty for teaching online (Ceja, 2010). However, these attempts may not be working. In 2013 a study by Allen and Seaman in conjunction with the Sloan Consortium, Babson Survey Research Group, & Pearson Foundation revealed that only 12.6% of faculty accept the legitimacy of online courses. It appears that despite the efforts of administrators to make online course more acceptable faculty member continue to doubt the offering.

College faculty are most comfortable with the medium they use the most. In this case, face-to-face learning. They understand this approach well and place value on the grades produced. Online learning is a new and different approach that contains many mysteries to them. Faculty members are content experts or course designers (Austin, 2010). They lack the technical skills and knowledge required to develop quality online courses. Since online courses rely on computer-based training, the role of the

designer in course development is essential (Irvin et al, 2009). The role of the faculty member diminishes in the online environment. The asynchronous nature of the course minimizes face-to-face contact between student and teacher resulting in a lower success rate (Frazer et al, 2006).

Barber (2011) also examined the views of faculty members in the decision to offer online courses. According to Barber many college personnel do not believe administrators are hearing their views on online learning. The lure of attracting additional students has swayed the opinions of many administrators. However, the role of faculty members in developing policy is limited. They are responsible for developing, teaching, and evaluating online courses but not determining policy. Since faculty play such a pivotal role in the offering online courses, Barber concludes they should have an increased role in the decision-making process.

Online courses need active learning tools to be successful (Piña & Bohn, 2014). However, faculty were not equipped to develop this new type of course (). In the past, instructors were the sole authority on how a course would be designed (Gregory, 2018). Online courses change that concept. Since instructors did not possess the skills needed to create an online course, they need the help of a third party to overcome the technological barrier (Irvin, Hannum, Farmer, de la Varre, (2010). Here, is where course developers enter the scene and faculty lose control of the course. The intent of course developers was to relive instructors of their technological burden and allow them to concentrate on teaching (Gregory, 2018). But using technology quickly

became an issue for instructors since many came of age before the rise of the digital age.

College faculty are content experts, and many did not possess the computer skills necessary to operate effectively in their online classes (Barber, 2011). The skill sets they had acquired over their lifetime could not be transferred to the new medium and they quickly became frustrated with teaching online. Faculty frustrations continued to grow as they felt pressured to teach a growing number of online courses (Czerkawski, Lyman, 2016). Faculty frustration led administrators to seek new options to address student demand. The creation of course management software such as BlackBoard, Moodle, and Google Classroom was an attempt to reduce faculty concerns and increase online enrollment (Picciano et al., 2010).

To assist faculty with designing online courses, The National Standards for Quality (NSQ) Online Learning (n.d.) has attempted to provide educators with systematic method of developing online courses. NSQ provides educations with a set of tools for developing learning outcomes based on course expectation. The idea being, that if an online course addresses and assesses the correct course competencies, the course will achieve higher success rates.

Quality Matters (QM) is another group providing methodologies for developing successful online courses. Like NSQ, QM provides a detailed set of standards that a college can incorporate into a rubric to test if an online course meets standards. Both QM and NSQ are attempts to address the growing desire for online courses and rectify

perceived deficiencies in online course design. Both approaches are predicated on the belief that well-designed courses will produce higher student success.

But this type of quality can have a high price. Not only are designers needed to work with teachers in developing course content, but they also needed course maintenance and improvement. According to Piña, & Bohn (2014), each online course requires a developer, a facilitator, and an instructor. That is a 3:1 personnel to course ratio. Puzziferro & Shelton (2008) suggest that online courses require even higher levels of support. They argue that online courses need a team of professions to develop and teach online offerings. This collaborative approach is vastly different from the one traditionally used by faculty. Currently, each face-to-face course only requires one instructor. Therefore, accepting online courses also means faculty sharing course development and operation with others. This is a major change from traditional face-to-face course offerings. College faculty struggle with operating in the new paradigm.

The additional cost of constructing and maintaining courses suggested by Piña (2014) and Puzziferro (2008) may exceed the budgets of many small rural community colleges who are using online courses to make up for deficiencies in enrollment. Online courses are a cheap and easy means of accessing revenue for the college. In these circumstances, it may not make financial sense for the college to pay for the additional cost. However, the implementation of funding metrics has not forced colleges to re-think how they have used online courses and determine if the mode provide monetary and well as academic success.

COMPARING ONLINE AND FACE-TO-FACE COURSES

Previous comparisons of the two learning modes have revealed contradictory results. Quantitative studies by Hart, Friedman, & Hill (2018) revealed that that there was no statistical difference in academic performance between students taking online and face-to-face business communication courses. Seife Dendir's (2016) study of online economic courses supports a different conclusion. Dendir reports that students taking online courses score higher than students taking face-to-face courses. This report implies that performance in online courses is not equal, but superior to face-to-face courses. An eight-semester work by Friday, Friday-Stroud, Green, & Hill (2006) also revealed students taking online management courses scored the same as those taking the same course in the face-to-face mode. Results on the subject vary depending on the study.

Other researchers comparing performance rates between online and face-to-face courses found similar results. Frimming, Bower, & Chulhwan's (2013) study of students taking health science courses also revealed no significant difference between the two modes of learning. These results support the findings of Lyke & Frank (2012) who investigated the performance of students taking Theories of Counseling. Lyke and Frank found that student performance in the modes to be statistically equal. Additional work by Barber (2011) comparing public speaking courses also produced not difference between instructional modes. Shreffler, Cocco, & Shreffler (2019) examination of sports medicine courses found learning mode not to be determining

factor in grade attainment. They determined that student motivation, satisfaction, and prior knowledge played an important role in course success.

Shreffler et al determined that face-to-face and online courses produced were or equal academic quality and the differences in academic performance resided within student motivation and preparation. This matches the findings by Garris (2020) and Glover (2016). To answer questions concerning online learning the state of California engaged in ten-year long-term study on student success and learning. The study examined 750,000 students enrolled in California's community college system's online and face-to-faces courses to determine how factors, such as instructional mode, impacted student success (Johnson & Mejia, 2014).

Data obtained by Johnson and Mejia revealed that students enrolled in face-to-face modes had a success rate of 70.6% while students in online modes had a success rate of 60.4%. The study determined that student success was not solely dependent upon mode in deciding a successful academic outcome. Student motivation and computer knowledge were also key factors. To explain the performance gap, the authors identified various factors (demographic, academic, course offering, and non-observable) and attempted to compare these results by controlling the factors. The study showed that a -7.4% difference accounting for none of the factors. The percent change increased as other factors with introduced. Student demographic and academic factors increased the difference to -7.6%. Course offerings accounted for -11.4%. Academic preparation and motivation have the biggest impact at -14%. This

indicates that these statistics cannot be used to determine the effectiveness of on online. They believe that student academic preparation also factors into success rates. These opinions are like those uncovered by Shreffler (2019) who found students that students who possessed computer familiarly and desired to take online courses had higher success rates.

While most of the research seems to indicate that there is no statistical difference in grades between the modes, some studies challenge this finding. Emerson & MacKay (2011) examination of assessment methodologies found that students who took paper exams performed outperformed students who completed the same exam on online. This study supports work by Heart (2018) who reported that while the two mode may not be statistically equal, other factors could influence the results. The authors suggest that other factors may contribute to student success in a course. An examination of course assessments may not be an accurate indicator of student success and course quality. Morgan's (2015) study of CPA pass rates revealed that students who graduated from online accounting programs had much lower pass rate on the CPA exam.

SUMMARY

The increase online courses and programs has been as result of student demand. Originally, online courses were designed for non-traditional students who were unable to attend face-to-face courses, but it has now expanded to include all students. Online went from being a niche market to a mainstream offering in a relatively short amount of time. As institutions raced to meet student demand for

online courses, instructional differences between online and face-to-face course were often ignored (Barber, 2011). This resulted in faculty using traditional face-to-face courses as the template for online course design. Comparisons between the two modes ensued and both faculty and students realized the weaknesses inherent with the design (Gregory, 2018. These weaknesses resulted in claims of academic inequality as critics labeled online courses as of lesser quality than their face-to-face peers did (McKenzie, 2017)

Despite claims of low levels of student success, students continue to demand online courses. While some institutions may have misgivings about online education the demand cannot be ignored. This is especially true for small rural community colleges who are facing declining enrollments, reduced state funding, and demand improved course success rates. Community college leaders are force to provide adequate learning opportunities while being mindful of the cost involved in providing those opportunities (Ceja, 2010). Data concerning online success rates is needed to counter negative views concerning the mode and to provide proof that the college is providing a course that leads to student success (Reilly, 2020). This is essential to the college's overall financial health as state governments continue reduce funding for higher education and have imposed performance-based funding models. If community colleges cannot produce success rates acceptable to state policy makers, they could face a dire financial future.

CHAPTER 3

RESEARCH METHODOLOGY

This study will compare the grades of online and face-to-face courses at Southeast Appalachian Community College (SACC) during the 2018-2019 academic year to determine if online courses produce students of equal academic quality as those taking face-to-face courses. This issue is of importance to the faculty, staff, and administrators of SACC who have debated the effectiveness of online education since the college implemented the mode twenty years ago. What began as a few classes intended to assist students who could not attend face-to-face, has transformed into something radically different. Now, the college offers more than few online courses. A student can complete their entire degree online.

The growing demand for online courses and online programs has led many to question the legitimacy of the instructional mode. People, both in and outside of academia, have questioned if students are getting a quality education when they take online courses. To that end state have begun tying a portion of the college's funding to student course success. If online courses are shown to produce lower success levels it could impact the financial health of SACC as well as many other community colleges who depend on online education to provide a source of revenue. Therefore, this study will attempt to ascertain if the two modes are of equal value by examining results from both course populations.

PROBLEM BACKFGROUND

The rising popularity of online courses have caused some faculty to question the academic rigor of such courses (Gregory, 2018). There is a growing perception among faculty that online courses provide students an easier path toward degree attainment (Barber, 2018). This belief has resulted in online courses being an easy way to obtain a college education. If left unchecked, this belief could result in serious issues for the small rural community colleges who have embraced online learning as means of providing additional enrollment. Recently, Kentucky mandated changes on how higher education is funded (Pitts, 2020). Student success is becoming not only an academic concern but also a financial one (Blackford 2018). Funding levels for higher education institutions consist of five prescribed areas. One funding area, course completion, is particularly worrisome to colleges. Course completion accounts for 35% of the college's budget (Spalding, 2017) and could be a major issue for small colleges. Ashley Spalding (2018) says the formula places community colleges, who serve disadvantaged population, at a disadvantage. These institutions may not be able to achieve the prescribed standard and loose needed funding. These changes call for increases in quality. Therefore, an increase in quality means an increase in money.

National crises, such as the March 2020 COVID-19, outbreak forced many P-12 institutions and higher education institutions to stop offering face-to-face courses and move courses online. As students and teachers struggled with how best to confront the new paradigm, the issue of quality learning became even more important. This shift will only highlight the academic quality question even further as states attempt to

address learning options. If online learning is not an effective substitute, the public may not accept the mode and demand other options. Therefore, the question of quality is of the upmost importance for all levels of education.

RESEARCH QUESTION

Is there a difference in success rates between online and face-to-face courses?

NULL AND ALTERNATIVE HYPOTHESIS

H0: There is no significant difference in the success rate of students based on the mode of the course delivery.

HA: Students perform better in face-to-face courses than online.

SAMPLE SELECTION

The sample will consist of grade data obtained from Writing I (ENG 101) course grade rosters during 2018-2019 academic year. All the courses offered by the institution during that year will be part of the study. Only those courses that were taken for a grade will included. Courses where the student elected to audit the course will not be included in the study. Additionally, students who were auditing or withdrew from the course will not be included in sample. Only those students who completed the course and were awarded a grade will be part of the sample used in the study. Since SACC does not have gradients for the withdraw grade (Withdraw passing or withdraw failing) it is impossible to determine the rational for not completing the course. Motivation is not part of the study. Therefore, the W grade option is not included in the study.

ENG 101 was selected to provide the sample since it was offered in both learning modes and provided enough grades for statistical analysis. The final grades

from all online and face-face sections of ENG 101 for the 2018-2019 academic year yielded a population of 327 student grades. 153 grades were from online courses, and 174 grades from face-to-face course.

RESEARCH DESIGN AND DATA COLLECTION

To compare student performance between online and face-to-face courses data was obtained from Southeast Appalachian Community College English 101 grade rosters. All online ENG 101 courses are synchronous. ENG 101 is a first-semester course taken at the college and provided a large pool of possible participants. Other courses could have been chosen but ENG 101 produced the largest population among first-semester courses. Other selections would have required comparing different courses (ENG 101 to ENG 102) to produce enough to yield a population for statistical analysis. The selection of ENG 101 allows a statistical comparison of student performance (grades) among the two learning modes (online and face-to-face).

To produce the data set used in my study, grade rosters for each section of ENG 101 for the 2018-2019 academic year was obtained from SACC. Since SACC grade rosters contain more information than course grade, and all personal data dealing with students needed to be removed from the data set leaving only course name, section, mode, grade, and quality points. Grades were then placed in either online or face-to-face groups. Duplication of data is not a concern since students can only enroll in one section of ENG 101 in a semester. Therefore, the 327 grades used in the study represent non-duplicated values for each mode of instruction.

Since course grade was in letter format, the grade had to be converted to a numeric value. Table 1 show how the 4-point scale was used to determine how GPA was used to provide a conversion between letter and number (A=4, B=3, C=2, D=1, E=0). This conversion is acceptable since the letter grade is not subdivided into categories that denote different levels of academic success (A+, A, or A-). The converted value was labeled Grade Value in the dataset and stored along with the letter grade for possible cross-reference.

Table 1: Grade Conversion

Letter Grade	**Score**
A	4
B	3
C	2
D	1
E	0

The study's two groups were identified by mode in the grade roster. Once the data required for the study was identified, a spreadsheet was developed to house the information. Online and face-to-face groups were placed in different columns based upon the mode identifier. Table 2 shows the descriptive statistics for each group to provide baseline information on the target groups. The population mean of each group was then calculated and compared to determine if a difference in GPA existed. The study is only concerned with instructional mode. The study does compares group to group, not section to section or instructor to instructor.

Table 2: Online and face-to-face Comparisons

	F2F	Online
Count	174	153
Sum	446	294
Mean	2.563218	1.921569
Variance	1.808119	1.849071
Standard Deviation	1.344663	1.359806
95% CI Margin of error	0.199796	0.215466

DATA ANALYSIS PROCEDURES

Data analysis was accomplished using a two-sample t-test to compare the two population means and determine if they are equal. The sample size of learning mode is not equal (N=174 face-to-face, N=152 Online). Since a one-to-one correspondence between online and face-to-face is not possible the two populations will be considered unpaired. Paring is not important when using a two-sample t-test and sample size if not an issue since the number for each sample if great than 40. These factors led to the non-paired, two-sample t-test to be used. The significance level for the test will be 0.05.

Since I am comparing the population means for each group, the hypothesis will be that the population means for both modes are equal. The null hypothesis is that there will be no difference between the success rate of online courses and success rate of the face-to-face courses. The alternate hypothesis is that there will be a difference between the two sample populations.

H0: $\mu 1 = \mu 2$

Ha: $\mu 1 \neq \mu 2$

My null hypothesis is that there is no difference between the two modes of instruction. Statistically equal scores would mean that mode does not impact student success. But if a difference occurs that would indicate that mode does impact student success. The degree of difference will be determined by comparing the mode scores.

LIMITATIONS OF STUDY

The study has several limitations. First, my study was limited to only one academic year. A longitudinal study encompassing several years may revel information absent from my study. A longer study may also revel trends in each group. Second, the study does not consider why, or when, students chose to withdraw from the course. Those grades are not counted in my study. If they were to be considered, it would mean adding the total number of withdrawals to number of failures. Since the reason for the student's withdraw is unknown, I chose not to include withdrawals in my study. Third, the study does not take instructors into account. It assumes that all instructors are of equal talent and produce similar results. The study does not take into consideration differences between instructors. The study assumes that all courses are of equal difficulty and each instructor uses the same grade methodology.

The study does not attempt to match online courses with equivalent face-to-face courses. Therefore, a direct comparison between the two modes is not possible. The study is concerned with the overall effectiveness online learning compared to face-to-face learning. Comparison to courses other than ENG 101 was not conducted.

Additionally, the study does not differentiate full-time and part-time enrollment. Students from each group are part of the study's sample.

The impact of course design on course success is also not addressed in the study. Piña (2014) asserts that course design is an essential part of the online learning experience and plays an important role in determining student success. The National Standards for Quality Online Learning (n.d.) also supports the importance of course design. However, the results of the study not linked to course design. This is limitation of the study given the role course design plays in course success (Piña, 2014).

Couse success is not limited to just the mode of learning. Student demographics can also play a part. The study also does not include demographic data on the students. Hart, Friedman, and Hill (2018) discovered that student demographics played an important role in determining success in face-to-face and online courses. Demographic data would be valuable in assisting course designers in developing online courses and enhancing course success rates (Gregory, 2018). An analysis of the demographic data could explain course success rates and possibly provide insight into the withdraw issue.

Last, the study's population consists of all students who received a grade for a course in that academic year. This means that each student could receive multiple grades. Since many students take more than one course each student can receive multiple grade entries in the study. This has a compounding effect on the data. A single student taking five courses is counted five times. However, this study is not

focused upon individual work but the overall effectiveness of online courses and comparison with face-to-face courses. To that end, the grades from all courses are included in the study.

SUMMARY

To determine if there is a difference in grades between online and face-to-face learning modes, a two-sample t-test will be used to compare the means of each population. The null hypothesis is that the two modes will have no difference in grades. If a difference in means exists, the two modes will not produce equal grades.

CHAPTER 4

RESULTS

The intent of this study was to compare the mean course grade among online courses with the mean course grade in face-to-face courses to determine if the two modes provided equal levels of academic performance. To test the null hypothesis (H0: $\mu 1 = \mu 2$) that the two modes have no statistical difference in grade attainment, grades were obtained from SACC ENG 101 class rosters and divided into online and face-to-face groups. The means for each group were determined then compared using a two-sample t-test to determine if a difference between the means existed.

A two-sample t-Test assuming unequal variances was conducted to determine if the sample mean GPA for face-to-face (M = 2.56, SD = 1.34) and Online (M = 1.92, and SD = 1.35) courses was statistically different or random chance. Table 3 shows the mean GPAs (expressed as mean) for each mode (face-to-face and Online). The test assumed a confidence interval (CI) of .05 (95%). The t critical one and two tail values were compared to the CI (.05) to determine if the null hypothesis could be accepted or rejected. Both the P(T<=t) one-tail (0.0000123) and P(T<=t) two-tail (0.0000247) are below the targeted CI of .05.

Therefore, we can determine that the mean of face-to-face courses is significantly different from the mean of online courses and reject the hypothesis that the means are equal. This indicates that the two modes do not provide the same level of performance.

Table 3: Sample t-Test

	F2F	*Online*
Mean	2.563218391	1.921568627
Variance	1.808119062	1.849071207
Observations	174	153
Hypothesized Mean Difference	0	
df	319	
t Stat	4.279860594	
P(T<=t) one-tail	1.23802E-05	
t Critical one-tail	1.649644319	
P(T<=t) two-tail	2.47605E-05	
t Critical two-tail	1.967428387	

After determining the two modes were not equal, I took a closer look at how the grades were distributed. Table 4 shows the descriptive statistics for each group. Data taken from ENG 101 courses shows students who completed face-to-face sections earned a mean GPA of 2.56, whereas online students earned a 1.92 GPA. The median grade for face-to-face was a B (3) and a C (2) for online. A skewness score of -0.72 indicates the curve for face-to-face is moderately shewed. This indicates more grades above the mean (higher grades). Where a score of -0.14 for online is fairly symmetrical indicating that the grades are more normally distributed.

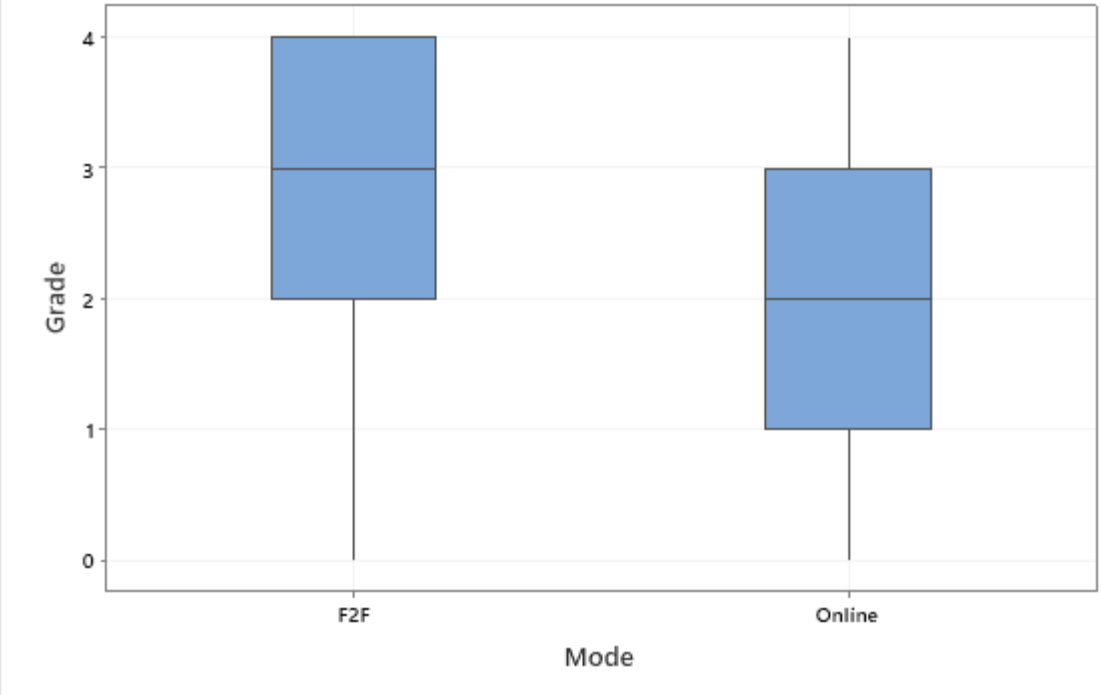
Table 4: Comparison

Variable	Mode	N	N*	Mean	SE Mean	StDev	Variance	Median	Skewness
Grade	F2F	174	0	2.563	0.102	1.345	1.808	3.000	-0.72
	Online	153	0	1.922	0.110	1.360	1.849	2.000	-0.14

Collectively, the mean, median, and skewness indicate that students enrolled in face-to-face courses of ENG 101 achieve higher grades then those in online ENG 101 courses. To better determine the degree of grade difference, a box plot was used to illustrate the difference in grade attainment. Table 5 shows how the grades for each

mode are distributed using a box diagram to outline the grade distribution among the two modes. Students in face-to-face ENG 101 courses were more like to score a grade of B (3) or higher than those in online ENG 101 courses. The reasons for these differences will be examined in chapter 5, but the data does indicate that the face-to-face mode produced higher student grades.

Table 5: Box Plot of Grades



SUMMARY

Results from the two-sample t-test showed a statistical difference between online and face-to-face modes. The compared means for each population were not equal. Since the sample means of each population was over 40, the two-sample t-test was used to compare grades. Skewness value indicated that students enrolled in face-to-face courses produce higher grade levels than online courses. A histogram analysis confirmed this assumption.

CHAPTER 5

DISCUSSION

Online learning is growing segment for many higher education institutions (Ceja, 207). As the demand for online sections grow, so do the doubts concerning the mode's effectiveness (Mathieson, 2010). The older face-to-face mode is better known and trusted by those inside and outside of academia (Puzziferro, 2008). Supporters of online education need data demonstrating that the online mode is equal to the face-to-face mode to be accepted (Mckenzie, 2018). This type of acceptance will require performance data that equals the face-to-face. If online courses are unable to meet this threshold, mainstream acceptance by faculty, students, administrators, and government agencies may not be possible.

This is a serious dilemma for colleges hoping to employ this mode. If they are not able to produce data demonstrating academic competency, the mode may lose support and cease to exist as a learning option. This could be a crippling blow for many students who are unable to physically attend college and employ online learning to obtain their educational needs (Spalding, 2018). Additionally, the funding obtained through online offerings have been of great benefit to rural community colleges. If online courses were proven to be academically unequal to face-to-face courses, college could lose a value revenue stream (Jenkins, 2014).

For rural community colleges this loss could mean additional reductions in course/program offerings as higher education institutions struggle to adjust to the demand required by formula-based funding models (Blackford, 2018). According to

Smith (2016) rural community colleges have already been forced to deal with years of reduced funding and additional cuts could hamper, if not eliminate, their ability to respond to the economic concerns of their population. In this chapter I will review the purpose of the study, findings, and the possible implications for SACC and other rural community colleges using both learning modes.

KEY FINDINGS

The two-sample t-test conducted on the two samples yielded a one-tail P value of 0.0000123 and a two-tail P value of 0.0000247. Both are below objective value of .05 and signify that the two means are not equal. The null hypothesis that the means of the two populations is rejected and the alternative hypothesis that the means of the two populations is not equal is accepted. The study demonstrates that academic performance between the two learning modes is not equal. A significant difference exists. However, the reason for that difference is not clear. The study could not determine if other factors influenced the outcome of course grades.

Additionally, the grades from face-to-face sections are not normally distributed. While grades do not need to be normally distributed the fact online grades are normally distributed is worth noting. The students from face-to-face sections earned higher grades than their online counterparts. It is impossible to determine if the higher grades were a function of mode or some other unknown variable. The study cannot determine why the grades are different, only that they are different. However, the higher distribution of grades in face-to-face sections is worth noting since they could indicate possible grade inflation.

IMPLICATIONS

For some, the findings will support the assumption that the face-to-face mode is better for achieving higher levels of student success. However, more research needs to be conducted before that determination can be made. What can be determined is that SACC, and possibly other rural community colleges, have a performance gap between online and face-to-face modes. The reason for the gap's existence may lie in course design. If so, rural colleges like SACC may face a tough financial decision.

Preserving the mode, and by extent, funding, may require the use of quality control measures such suggest by the National Task Force on Institutional Accreditation (2012), National Standards for Quality Online Learning (2019), and the CHEA Institute (2002). Each group calls for online courses to develop procedures for developing and accessing online courses and programs. However, these techniques are not limited to online courses. They can be used to assist in developing and enhancing all modes (Gregory, 2018).

If SACC is unable to reach state mandated course success numbers, the college may need to implement a college-wide method of course development. While face-to-face section did outperform online sections, both modes may produce success levels that are acceptable by the state. If so, the question of mode may be a moot point. The incentive for comparison may fade away if funding is not an issue. While faculty may continue to discuss the merits of the modes, it is the state, that determines course success.

The study's findings may do little to assist SACC in their attempt to determine the validity of online courses. Surely, those favoring face-to-face courses will use the study to validate their views, while those favoring online will cite the study's limitations and call for more research into the topic. Although the study failed to show that mode modes produced equal levels of academic success, the study's findings may encourage SACC faculty to engage in meaningful discussion on the topic and re-evaluate the meaning of academic success. Success may not be solely based on mode but consist of many different factors. These many factors working collectively may be what determines success and not the mode alone. If we can identify the most prevalent factors that impact student learning and success, we may then be able to determine how impactful mode is on student achievement.

Currently, SACC is only interested in determining success based on mode and uses success rates to decide if a course has been successful. Success rates are obtained by dividing the number of students passing a course by the total enrollment for the course. This method was also used to determine if the mode was successful. SACC asserts that any course that obtains a 70% or higher success rate is considered successful. Table 6 shows the success rate as determined by using the current success rate formula and the study sample. The success rate for face-to-face was 85% and the success rate for online was 75%. By this measure both courses would be considered a success even though the study failed to show equality among modes. This is an important point for SACC. The performance-based funding model used my SACC states that student success is determined using the course success rate. A student

only needs to pass, earn a grade of D or higher, to be considered successful. SACC needs to determine what percentage of students is acceptable for a course and then use course development strategies to made improvements.

Table 6: Success Rates

	F2F	Online
Number	174	153
Pass	149	116
Pass Rate	0.856322	0.75817

This is notable since the descriptive statistics obtained by the study revealed similar results. Examining table 7 you will see that the median value for face-to-face is 3 which matches the 85% value obtained from using the success rate. Online scored 2 matching the 75% value. However, the mean grade for both modes was one grade level less than that stated in the success calculation. Face-to-face students earned 2.5 (C) and online students earned 1.9 (D). This is a result of the success formula is based on its use of a binary determinate (pass/fail) and totaling the number meeting the criteria. Whereas the t-test obtained the value by calculating the mean value.

Table 7: Comparison

Variable	Mode	N	Mean	Median
Grade	F2F	174	2.563	3.000
	Online	153	1.922	2.000

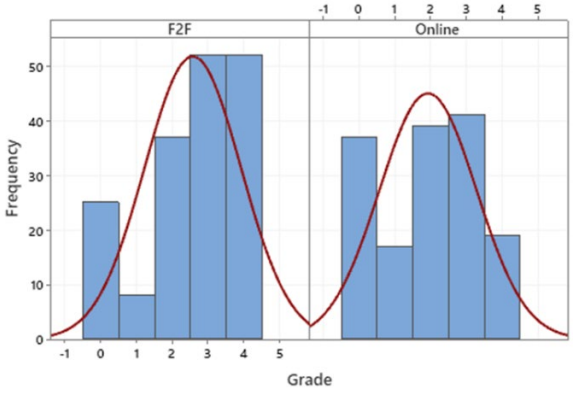
FUTURE RESEARCH

More research in online and face-to-face courses needs to be conducted before a determination on success rates can be reached. Examining the following assertions may provide additional information on the topic. First, the study does not take into consideration academic consistency. Each course may not require the same academic

requirements to complete the course. Differentiation among the courses could have contributed to the result and should be examined. Faculty for each course could have different levels of expectation from their students. This in turn, could lead to different outcomes. The study operated on the assumption that all courses in the study required the same course requirements. An evaluation of a single faculty member's online and face-to-face courses may yield additional information. That data may enable a comparison between faculty based on mode. This could also assist faculty and administrators in matching faculty with mode.

Second, grading bias should also be examined. Grade distribution can also be seen in table 8 which employs a histogram to breakdown the grades for each mode. The symmetry of the normal curve is apparent. The curve shifts to the right showing the grades to be right-skewed and indicates a higher number of grades A and B. Compared to online sections where the number of A and B grades were fewer. Instructor bias may not be the reason for this shift. Other factors may have contributed to the shift. Using the data from the study we cannot determine what caused the shift. Additional investigation is needed.

Table 8: Histogram of Grade by Mode



Third, the issue of withdraws. The subject of student motivation has been ignored in this study. But motivation is a crucial component of learning and needs to part of any study on performance. Students who failed to complete the course were eliminated from the sample. The study was only concerned with academic performance and dropping could be for non-academic reasons. If the non-academic drops could be removed from the sample and leave the academic drops, it could alter the study's findings. Additionally, student motivation for dropping could be pertinent. Knowing why students failed to complete a course would provide meaningful insight into how courses are designed and developed. This would be a benefit to both learning modes and should be explored further.

To provide some possible insights into the problem withdraws presents, the number of withdraws were added back into the sample and the statistics recalculated. In Table 9 the number of students who withdrew are added back into the study's sample, and the withdraws are treated as failures. This produces a drop in the mean score for both F2F (2.24) and Online (1.62) modes. The drop in mean GPA for each mode is understandable since the additional of students also means the addition of zero GPA scores.

Table 9: Withdraw Statistics

Mode	N	Mean	StDev	SE Mean
F2F	199	2.24	1.52	0.11
Online	181	1.62	1.43	0.11

The decision whether to include withdraws in the study must be examined closer. In this study, withdraws could be included since the course was not completed and a grade earned. However, withdraws do play a role in determining student

success and a method needs to be developed to illustrate their impact on mode performance. Table 10 compares the success rates for both modes without, and with, withdraws. Again, the pass rate declines as the withdraws are factored into the study.

Table 10: Withdraw Comparison

No Withdraws				Withdraws Added		
	F2F	**Online**			**F2F**	**Online**
Number	174	153		**Number**	199	181
Pass	149	116		**Pass**	149	116
Pass Rate	0.856322	0.75817		**Pass Rate**	0.748744	0.640884

Fourth, will a change in course yield a different result? This study only uses one course to test the null hypothesis. It would be interesting to know if how other courses compared. Also, a comparison of all online and all face-to-face courses could produce a different conclusion. The number of online courses taken by a student was not considered. Performance may alter depending on the number of courses (online or face-to-face) taken in each semester. It may be better to compare performance of online students to face-to-face students instead of course to course.

Last, to what degree did socio-economic factors play in determining student success? Do success rates change according to factors such as age and race? If they do change, can the change be predicted? This data could open more avenues of investigation and provide information how to courses can be customized to address the needs of targeted populations.

SUMMARY

The purpose of this study was to determine if SACC online courses produced equal grades as face-to-face offerings. To answer that question the students from online and face-to-face sections were compared using a two-sample t-test to

determine if the two groups produced statistically similar results. The online sample was not equal to the face-to-face section, resulting in a rejection of the null hypothesis that both modes yielded the same academic product. In fact, the students in the face-to-face sections earned higher course grades than the online sections. Since online sections did not yield equal grade performance SACC must now address why the grade production is different and what can be done to equalize grades across modes. This outcome may not provide SACC with a solution to the mode issue. In fact, the outcome may only serve as portent of more ominous things to come.

CONCLUSION

As the demand for online courses has increased, so has the concern about online success. While this is a concern for all institutions, it is of particular importance to rural community colleges who are struggling with financial as well as academic issues. (Jenkins, 2014) Performance-based funding models have moved the issue of course quality and success rate to the forefront of discussion. Prior to the implementation of performance-based funding the question of course quality was purely scholarly. Now that colleges have been asked to provide data on success rates course quality has become real concern.

Fearing colleges may only be concerned with obtaining funds and not be concerned with student success, states have begun to implement performance-based funding models to ensure that college are developing and teaching courses that promote student success (Pitts, 2020). This issue is especially important for rural community colleges who are often forced to operate with few resources. A lack of

resources, along with a skeptical view of the mode's validity, has produced an atmosphere of distrust concerning the online mode (Smith, 2016). This study was undertaken to provide information on how the two modes compared. To that end, the study was successful. The study has provided meaningful insight on how the modes compare and highlighted concerns that need to be examined. Most markedly, mode may not as important to success rates as many believe.

Supporters of online may look at the data and determine that while not equal to face-to-face, students were successful. In turn, face-to-face supporters will decry the effectiveness of online pointing to lower GPA mean scores and a failure to achieve matching mean GPAs with face-to-face courses. Both parties can find both data in this study to support their stance on the issue. Therefore, I expect the discussion concerning academic success and mode to continue.

Colleges need to be cautious when using instructional mode as the only factor in determining student success. When determining success, mode may not be the only variable that influences the outcome. Other factors, such as student motivation, faculty bias, technology, and faculty skill with the online medium could play a role in determining if a student will be successful. Other factors beyond those I have listed could also play an important part. This study should be used as a guide in developing future research on the topic.

The literature on the topic tends to support this assumption indicating that student success is a composite of serval different factors with mode being one of them. But for those invested in online education the question of quality remains. As a

new instructional mode, online must prove that can provide equal success before gaining acceptance among some faculty. The question of quality will persist as new questions are asked, tested, and analyzed.

The propagation of online learning will surely continue to grow as students look for alternate modes to obtain an education and college attempt to find new sources for their student body. The growing cost of attending college, changes in the workforce, and natural disasters are going to force colleges to reexamine how they design and offer courses. COVID-19 has demonstrated that colleges must be prepared to use the online mode if only as an emergency contingency.

Education has passed the Rubicon as far as online courses are concerned. Student demand has insured that the mode will survive despite opinions otherwise. Therefore, community colleges need to alter how they perceive online courses and begin asking how they can improve success rates in all modes not just online. Colleges cannot accept that face-to-face sections are successful by default. Study among all modes and courses needs to take place to promote student success and provide students with the best opportunity to learn.

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