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The Relationship between Student Performance in Technical Courses and Grades in Remedial Courses

Charles R. Rowland Jr

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The relationship between student performance in technical courses and grades in
remedial courses

By

Charles R. Rowland Jr.

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Community College Leadership
in the Department of Leadership and Foundations

Mississippi State, Mississippi

May 2017

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2017

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remedial courses

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Title of Study: The relationship between student performance in technical courses and grades in remedial courses

Pages in Study 68

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The purpose of the study was to examine the relationship between the academic performance of students in technical studies and their grades in remedial courses of study. Data were gathered from students in the Law Enforcement Technology program from the 2013-2014 academic year at a rural community college. This study examined the statistical correlation of the grades of those students who completed Beginning English and Beginning Algebra with those same students who also completed CRJ 1313 Introduction to Criminal Justice and CRJ 1323 Police Administration and Organization

The study utilized a Pearson Product Moment Coefficient of Correlation (Pearson r), and calculations were conducted on the basis of the grades of 45 students in a rural community college in Mississippi who have completed Introduction to Criminal Justice, Police Administration and Organization, Beginning Algebra, and Beginning English during the Academic Year of 2013–2014. Multiple correlations of grades were calculated in Introduction to Criminal Justice, Police Administration and Organization as dependent variables, and in Beginning Algebra and Beginning English as independent variables.

DEDICATION

This dissertation is dedicated to my wife, Jana. Thank you for your unconditional love, support, and patience.

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I would like to express my appreciation to my major professor, Dr. Dan Stumpf. His guidance and instruction have influenced me tremendously as an administrator and future leader. I would like to thank Dr. Stephanie King and Dr. Ed Davis, for their help through a difficult time. I would like to thank my family and friends for their support while working on this this project. I would also like to express my gratitude to Dr. Michelle Sumerel, and my Itawamba Community College family for their encouragement and opportunity to complete this degree.

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CHAPTER I

INTRODUCTION

The typical rural community college will very likely have a primary mission in which to provide high quality instruction, devoted instructors, and dedicated student support. Many of the eLearning departments at a rural community college may provide online learning environments that foster change in the individual; are not bound by the constraints of time and place; are collaborative with other rural community colleges; are creative with electronic delivery; are driven by learner need; have measurable, predictable outcomes; provide quality online courses comparable to traditional delivery; and engage learners in an active mode. The Mississippi Virtual Community College consortium has experienced growth from its first class offerings of 29 classes with 1,382 enrollments to an increase in the fall of 2013 of 2,994 classes taught by 1,532 instructors for a total of 68,142 enrollments (Mississippi Virtual Community College, 2014).

Relevant institutions include colleges and 4-year universities concerning a rural community college's articulation agreement. These articulation agreements contain programs of courses appropriate for transfer for community/junior college students who may be interested in attending a 4-year university after leaving the community college. At the bottom of each offered program's curriculum, a community college may list the 4-year universities which offer the baccalaureate degree program and will accept those completed community college hours. Rural community colleges may view these

articulation agreements as a means to improve student support (Jaeger, Dunstan, & Dixon, 2015).

Each university will accept courses as listed on the particular transfer program without loss of credit toward the conclusion of the 4-year degree. It is intended that this articulation agreement be a minimum program transfer for all students moving from the community/junior college to the 4-year university system, as well as moving between universities in the system, acting as a "safety net" for transfer students. These articulation agreements are established in order to provide a smooth transfer from community college into the 4-year universities (Stern, 2016). It is not intended to replace any individual articulation agreement between a particular community/junior college and a university which would allow additional courses to transfer into a specific program of study.

The eLearning programs at a rural community college will intend to provide online learning environments that foster change in the individual; are not bound by the constraints of time and place; are creative with electronic delivery; are driven by learner need; have measurable, predictable outcomes; provide quality online courses comparable to traditional delivery; and engage learners in an active mode. The instructor's role is just as important in an online class as it is in the traditional classroom setting (Stumpf, McCrimon, & Davis, 2005). More and more students may choose online education as a mode of course delivery because of increasing environmental demands such as travel expense, employment and family obligations. Many of these online courses that are chosen as well as required, for some students, at rural community colleges are remedial course offerings.

Asynchronous learning can occur anytime and anywhere. Many rural community colleges may offer entire courses as well as curriculums that are available online as asynchronous. Examples of asynchronous learning tools include discussion forums, assessments, and activities that may be completed at any time, but may include a due date for submission of an assignment. Online classes that support this type of learning give the student more control over when and where communication and completion of assignments happen. It also gives the student more time to reflect and respond (Gold, 2003).

Many rural community colleges in contemporary times may offer career and technical programs which are designed to prepare individuals to enter the workforce with the academic and vocational skills needed to compete successfully in the local job market through the most advanced training available. President Obama's Administration has been supportive of the community college and the need for technical programs including funding from the federal government (Moore, Jez, Chisholm, Shulock & California State University (2012). It is not uncommon for a rural community college to offer up to 30 different technical programs, and may have different facility locations within the district of the college which may include different campuses in counties within that community colleges' district.

A typical rural community college may offer many technical degrees and concentrations. Some community college technical degree curriculums are offered completely online, and all course-work can be fulfilled by taking the online courses. Many of the technical programs offered at a community college can provide earnings or returns to the student (Stevens, Kurlaender, Grosz & Center for Analysis of

Postsecondary Education and Employment (2015). The online programs are very similar to that of the traditional programs such as when a student may need to take remedial courses prior to advancing to the academic or technical course work. The Law Enforcement Technology degree at one rural community college is an example of such a degree offered entirely with online courses, however, some of the courses in this technical curriculum can be taken traditionally if the course is offered on campus. This study will examine the effect of students completing remedial courses, and their performance in technical courses.

Remedial courses may have an effect of on a timely graduation when a student has to take several remedial courses. Remedial courses in Beginning English and Beginning Algebra may have several different sequential course offerings in which a student may need to complete in sequence. Students who may need to take the remedial courses in sequence may also be recipients of financial aid. Taking the numerous remedial courses in sequence may utilize a portion of the student's financial aid. If a student does not successfully perform in a remedial course, and pass that course with an acceptable score this may require the student to retake the remedial course, before moving into the technical courses. Successful student performance in the remedial courses are important, due to the costs a student may pay as well as the possibility of slowing graduation and entry into the workforce, and community colleges may need to provide remedial courses for the academically underprepared (Rutschow, Cullinan, Welbeck & MDRC (2012). Some students are placed in remedial courses such as Beginning English and Beginning Algebra, which if successfully passed with a grade of

“C” or better will allow the student to be admitted into English Composition I, or College Algebra.

Statement of the Problem

The problem of this study is the extent to which there is a relationship between the academic performance of students in technical studies and their grades in remedial courses of study.

Purpose of the Study

This study examined the extent and problems concerning the relationship between the academic performance of students in technical studies and their grades in remedial courses of study. Data were gathered from students in the Law Enforcement Technology program at a rural community college from the 2013-2014 academic year. This study also examined the statistical correlation of those students who completed Beginning English and Beginning Algebra with those same students who also completed CRJ 1313 Introduction to Criminal Justice and CRJ 1323 Police Administration and Organization

The study utilized a Pearson Product Moment Coefficient of Correlation (Pearson r), and calculations based on the grades of 45 students in a rural community college in Mississippi who completed the technical courses Police Administration and Organization, Introduction to Criminal Justice, and academic courses Beginning Algebra and Beginning English during the Academic year of 2013 – 2014. Multiple correlations of grades were calculated in Police Administration and Organization and Introduction to Criminal justice as dependent variables and in Beginning Algebra and Beginning English as independent variables.

Research Questions

The following research questions were answered in order to meet the purpose of the study:

1. What is the relationship of grades between Police Administration and Organization and Beginning Algebra?
2. What is the relationship of grades between Police Administration and Organization and Beginning English?
3. What is the relationship of grades between Introduction to Criminal Justice and Beginning Algebra?
4. What is the relationship of grades between Introduction to Criminal Justice and Beginning English?
5. What is the relationship between grades in police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables?
6. What is the relationship between grades in Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables?

Design of the Study

Grades were tabulated for students in each of the following courses of study: Police Administration and Organization, Introduction to Criminal Justice, Beginning

Algebra, and Beginning English. Each participant was assigned numerical values to the student's final letter grades of A, B, C, D, F, such that A = 4, B = 3, C = 2, D = 1, F = 0.

The study calculated a Pearson r to obtain correlation of grades between Police Administration and Organization and Beginning Algebra, a calculation Pearson r to obtain correlation of grades between Police Administration and Organization and Beginning English, a calculation of Pearson r to obtain correlation of grades between Introduction to Criminal Justice and Beginning Algebra and a calculation of Pearson r to obtain correlation of grades between Introduction to Criminal Justice and Beginning English.

In order to ascertain the inter-correlation of independent variables in the multiple correlations below, there was a calculation of Pearson r to obtain any correlation of grades between Beginning Algebra and Beginning English. The study contains a calculation of a multiple correlation of grades for Police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables. There is also a calculation of a multiple correlation of grades for Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables.

Delimitations

The researcher acknowledged the following possible limitations and delimitations of this study:

1. The study did not contain data from hosted colleges (schools other than ICC) for the online students.

2. The study was limited to one program at a rural, public 2-year community college in the State of Mississippi.
3. The study includes data from the academic 2013 - 2014 year.
4. The study includes data from one program at ICC which is the Law Enforcement Technology program.

Limitations

1. The communication between instructors who may have knowledge of student's rationale for withdrawing or not completing an online course.
2. Lack of student's understanding of technology with online courses may have affected the impact of the internal validity concerning the results.
3. The absence of independent demographic variables consisting of age, race, gender, and income level may call into question construct validity of this variable.

This study empirically measures the influence that developmental courses have on student's final grades in technical courses. This study is limited to focusing on one community college, and one particular technical program, and this aspect is considered a limitation. In an attempt to determine the reasons for drop-out students, and non-completion of the online courses this evaluation may not be able to provide a clear manifested answer. It is possible that, if the findings are significant, the results will be generalizable to online programs to community colleges throughout the United States. Information from this study will provide a model for other colleges, due to the data

determining relationships between online intermediate courses and their effect on online technical courses.

Limitations of a rural community college's eLearning program evaluation include some difficulty in obtaining data from hosted colleges (students who take online courses from a hosted college) for those online students. Other limitations include the communication between those adjunct instructors who may not have knowledge of student's rationale for withdrawing or not completing an online course. Literature available for online student retention is plentiful at the community college level.

Significance of the Study

Developmental courses are offered to students, and provide the possibility to progress into the full academic or technical coursework, in order to successfully fulfill the requirements for a college degree. In regards to academic instruction, these developmental courses may better prepare students in becoming more successful in the technical courses. Most, if not all of the academic developmental courses are also offered as distance learning or online courses. Within the field of education, the online developmental courses require students to navigate the course as well as submit assignments. One concern in particular, for colleges who may offer distance learning courses is the recognition of the absence of any face-to-face interaction among students and instructors. Many online learning platforms have the ability to offer synchronous learning, and some research suggests the possibility of better retention when using these tools (Reigle, 2010). This aspect may have effects on retention as well as student performance and graduation rates. Some rural community colleges such as ICC require mandatory student orientation training as well as instructor training, for online

coursework which is a major strength of ICC's eLearning program. This orientation provides students with college policies and procedures necessary to become successful in the online environment. Every online course has the eLearning orientation implemented. Additionally, the online courses provide useful tools and resources to help support the students' educational needs during their online experience.

In regards to student performance and retention, ICC in specific has implemented many helpful features within the online courses, in order to provide students who, take developmental online courses with the adequate technological tools. The Advanced Education Center facility at ICC includes workspace, training areas, computer lab, testing facilities, offices, and classrooms. Many of the classrooms also have teaching technology tools available. A major strength of the eLearning program at ICC is the highly dedicated faculty and staff. These individuals are committed to quality support and instruction through the use of technology and innovation. The division of eLearning provides professional development that demands the highest professional teaching standards for teaching via the internet, encourages continuing scholarship and technology training among faculty, and recognizes the importance of faculty participation in the institution's eLearning program. Some research suggests aspects such as the number of courses an instructor teaches can have an effect in the online instructional environment (Perry, 2010).

Definition of Terms

The following terms are defined for the purpose of this study:

1. Asynchronous learning refers to learning that occurs at any time. Instructors make materials and assessments available and students may complete them at any time (elearners.com, 2016).
2. Career–technical core – A required career–technical course for all students.
3. Community college is defined as an institution that is committed to serving the needs of the community in which it is in and is a regionally accredited institution of higher education. A community college offers the Associate degree as its highest degree (Vaughn, 2006).
4. Distance Education is a formal educational process in which the majority of instruction in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous (sacscoc, 2013).
5. Interaction refers to student and instructor communication as well as student communications among themselves (Gold, 2003).
6. Online course is defined as a delivery where at least eighty percent of the course content is delivered online (Allen & Seaman, 2011).

7. Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course.
8. Retention refers to the number of students that are retained for a defined length of time. The quantitative definition of retention varies (Dietz-Uhler, Fisher, & Han, 2008).
9. Synchronous learning requires students and instructors to be online at the same time (elearners.com, 2016).

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Introduction

Community colleges are receptive in taking on the task, for educating the different and diverse communities that they serve. Community colleges across the United States have proven to be very effective in answering many of the issues a community may have in providing the needed quality training, in order to accommodate the employment needs. Although many, if not most of the community colleges in the U.S. experience an array of issues concerning providing to the needs of the citizens that they serve, they are consistently up to the challenge to offer the needed instruction. Vaughn (2003) describes some of the necessities that community colleges should strive for, such as open enrollment, providing quality education, and training the citizens to become lifelong learners. Instruction is defined by Cohen and Brawer (2008) as “the process of causing learning. Learning may occur in any setting, but instruction involves arranging conditions so that it is predictable and directed” (p. 464).

Although remedial learning has been around for some-time now in the academic realm, many may question its ability in being able to successfully prepare students, for completion of technical courses. The eLearning departments found at many rural community colleges supports the opportunity for allowing education to become accessible anytime and anywhere, and at the same time providing the freedom to learn

while fulfilling other commitments such as jobs and families. Many of these online courses are offered as semester-based as well as short-term or condensed classes with a timeline that includes registration, withdrawal and final exam deadlines similar to on-campus courses. Remedial courses are also part of online course offerings. Online courses normally receive the same credit hours as traditional courses. Online courses can be very popular, and can make up a great percentage of a community college's enrollment. According to Allen & Seaman (2013) "Thirty-two percent of all higher education students in the United States take at least one course online" (p.1).

The goal of these technical curriculums is to equip students to become quality employees, and take advantage of an array of regional as well as local job opportunities. Students are awarded a Certificate of Completion or an (AAS) degree upon completion of the program of study. Some technical curriculums may offer both a Certificate of Completion as well as the AAS Degree. In addition, some technical programs may offer other credentials as well for a technical program. Many states are actively engaging in providing more than one credential which may help the student in becoming more desirable in the workforce after graduation (Ganzglass & Center for Law and Social Policy (2014).

Many rural community colleges, are 2-year public-supported community colleges dedicated to serving the educational needs of the citizens within a community. Career and technical curriculums are unique and tailored to specific industries and must maintain flexibility in order to adapt to the changing skills necessities in those industries (Ruppel, 2012). A typical rural community college may be comprised of districts in which several surrounding counties participate on the college's board. The typical rural community

college may describe its main purpose as being able to provide comprehensive educational opportunities of the highest quality through academic, vocational-technical and personal enrichment programs in order to meet local needs at low cost to students.

This chapter is a review of the literature concerning the remedial courses and their effect on student retention and success. Each section of this review will analyze and summarize assumptions as well as any major and significant determinations regarding remedial coursework. Community college students are often placed in remedial courses, and these decisions are most often determined, due to an unsatisfactory pre-placement score. These pre-placement scores may be determined by SAT, ACT, or tests the college themselves administer. Ngo & Kwon (2015) state, “however, concerns about accurate placement have recently led states and colleges across the country to consider using other measures to inform placement decisions” (p. 442).

Online and Traditional Remedial Courses

Many students wishing to pursue a degree at a community college are not prepared for the full academic coursework, and are placed in the remedial courses. Community colleges are increasingly seeking to increase numbers in regards to the degree completion rate. Some may debate that online course offerings, are not the best fit for an increase in graduation. In one particular study completed by the Community College Research Center (CRCC) it was concluded that students did much worse in distance learning courses as opposed to face-to-face classroom instruction, and that students who attempted more courses online were not likely to continue and complete degrees (Xu & Jaggars, 2013). Some community colleges are combating these negative

issues associated with online learning and poor retention, by redesigning the online courses in order to allow students to navigate the courses more easily (Jenkins, 2015).

The issues of the increasing problems, due to declining literacy has become an issue for most, if not all community colleges. Many community colleges in the U.S. offer intermediate level courses, for students because of the decline in literacy. According to Cohen, Kisker & Brawer (2013) “Declines in academic achievement during the 1970’s and subsequent stabilization were confirmed by the National Assessment of Educational Progress (NAEP) studies of seventeen-year-old students” (p. 237). Many community colleges’ now offer most, if not all courses, including the intermediate level courses online in hopes of benefiting retention efforts.

These online course offerings may also help with recruiting efforts as well. Some students may find online courses attractive, due to negating transportation issues as well as physically attending a class. Online classes are defined as an educational delivery mode where at least 80% of the course content is delivered online (Allen & Seaman, 2011). Online delivery of course material may be provided in a synchronous or asynchronous fashion. Synchronous learning entails that the teacher and student be online during the same time, whereas the asynchronous environment may require the student to complete assignments within a given time-frame. Some examples of synchronous and asynchronous learning tools include online chat and web conferencing.

Many community colleges are now implementing entire degree curriculums that are offered entirely online. Colleges and universities have increased distance course offerings exponentially, and online learning has become commonplace over the last fifteen years (Palloff & Pratt, 2007). Some students are encouraged to successfully pass

certain entrance exams in order to manifest their ability, or possible deficiencies that may inhibit them from being successful in the coursework. In one study, Bahr (2012) discusses the sizable quantity of students taking remedial courses at community colleges. The study determines students who are at the lower end of the continuum needing remedial courses, and who are less likely to do well in college courses. The study examined first time students at 105 California community colleges, and utilized three characteristics in order to find any rationale for the difficulties students experience when placed at the lower end of the spectrum concerning remedial coursework. The three characteristics examined are nonspecific attrition, skill-specific attrition, and course-specific attrition. The study focused on math as well as English remedial courses.

During the nonspecific attrition phase, students make the determination to continue on to the next remedial course or drop out. At the skill-specific attrition phase, students at the low-skilled students will likely drop out as compared to those higher skilled remedial students. During the course-specific attrition phase, students at the lower end skill-level may find transitioning from one level of remedial course in sequence to be too difficult and drop out. The study utilized a series of regression logistic models, and determined that duration of enrollment can have a significant effect on successfully passing remedial reading as well as remedial math courses when taken in sequence.

Remedial Course-Work in High School

Remedial course-work is not specific to the community college. High-Schools also offer students the opportunity to enroll in transition courses, in order to prepare for college. One such study conducted by Cramer & Mokher (2015) examined 12th graders at a Kentucky high school. The remedial courses were offered to those students who

scored below the State's benchmark on the ACT. The study concluded that 93% of the participating students in the math remedial course scored 93%. Remedial courses are offered at many k-12 schools, and community colleges, however, the question many continue to ask is, do remedial courses offer any success for the students enrolled in these courses? Another study by the Ohio Board of Regents (2006) examined a population of 62,231 first-time, first-year degree seeking students in the state of Ohio. This study determined that only 27% of those students who participated in the remedial coursework were able to earn an associate degree within six years. The study also concluded that 54% of first-time degree seeking students who did not take the remedial courses were able to earn an associate degree within the six-year time frame.

Community colleges are consistently concerned about having successful effective approaches concerning remedial courses. One particular study by Lavonier (2014) examined the effectiveness of two instructional approaches for remedial reading courses at a community college. The instructional approaches were strategic reading and traditional, textbook-oriented instruction. The two research questions that guided the quantitative, quasi-experimental study are: (a) what is the effect of strategic-reading instruction on the reading performance of community college students in a developmental reading course and (b) what is the effect of traditional, textbook-based instruction on the reading performance of community college students in a developmental reading course?

The sample in the study consisted of 64 participants. Two groups of students participated in this study: (a) the experimental group ($n = 32$), who received the strategic-reading instruction, and (b) the control group ($n = 32$), who received the traditional,

textbook-oriented instruction. Students completed the Nelson-Denny Reading test as a pretest and posttest to determine the effectiveness.

The null hypotheses for H1 and H2 were rejected because the results of the paired t-test indicated strategic-reading instruction and traditional, textbook-based instruction have a statistically significant positive effect on student performance on the Nelson-Denny Reading Test. The one-way analysis of variance test also determined there is not a statistically significant difference between the difference scores of the students who received strategic-reading instruction and the students who received traditional, textbook-based instruction. The findings show that both methods of instruction are equally appropriate for the remedial reading course.

Community College Students and Remedial Courses

One mission of many community colleges is to find new means, or alternatives in order to combat the issues of low retention and low graduation numbers. The needs of the community are a consistent consideration that community colleges are aware of.

According to Vaughn (2000), community colleges have specifically five missions or goals: open access, lifelong learning, community service, comprehensive education, and teaching and learning. In order to reach these goals, the community college serves the following functions: academic transfer programs, vocational–technical education, continuing education, remedial education, and community service (Cohen & Brawer, 2008; Vaughn, 2000).

Community college's in contemporary times are concerned with the varying factors concerning diversity of the populations they serve as well as the different skill levels that a new student may possess when enrolling. Cohen & Brawer (2008) aptly

describe these students as being many in number and variety. Community college student populations include increasing numbers of minority, first-generation, and disabled students. Diversity can be seen with ages of students at community colleges as well as gender. Fishman (2015) describe community college students as being more likely to be older, commuters, and having dependents. As compared to their 4-year counterparts, community college students may be to a lesser advantage concerning socio-economic status. There is also a significant rise in the number of students needing at least one remedial course and financial aid. Fishman (2015) states, “More than 40 percent of undergraduates at community colleges enroll in remedial coursework, according to Department of Education data” (p. 11). The research describes that many students who begin in remedial courses may not graduate within a three-year time period.

Remedial Course Method of Delivery

Hachey, Wladis & Conway (2012) examine how online instruction and completely online programs have particularly boomed at community colleges. This may be attributed to the fact that online education fits very well with the community college’s mission of open access and commitment to meet students where they are. Online education allows community colleges to meet their goals by providing a wide range of classes and programs to students. This particular research examines the numerous course offerings that are available online.

Community colleges are aware that online course delivery has made significant changes over time, and is an aspect that may be considered vital in the strategic process. Allen & Seaman (2013) report that, based on responses from over 2,800 colleges and universities, 69% reported that online learning was a critical part of their institution’s

long-term strategy; this is partly due to the continued increases in online enrollment. The study reports that there was a 9% increase for online enrollments as compared to the modest 1% growth of the overall student population. Out of all higher education students in the United States, 32% take at least one course online. This research is definitely important to the evaluation as it manifests the growth of online courses in the college environment.

Retention

Community college faculty are aware of issues that prevent student success concerning remedial online course completion. Students report several reasons for not completing remedial online classes that usually fall within three categories: personal, academic, and structural. These include several personal issues such as family and work obligations, job changes, and private problems. Academic reasons can be traced back to the increasing number of students entering college that require remedial education. Poor high school performance or incomplete high school degrees additionally contribute to students not completing online courses according to Dietz et al., (2008).

Fike & Fike (2008) determine that, when trying to determine predictors of retention and student success, most of the empirical studies have concentrated on traditional students, which would include students ranging in age from 18 to 24 and students who are high school graduates. It is important to recognize that community colleges enroll a different demographic with over half of their students being over the age of 25. This study discusses the relevance of the broad demographic variables as well as the online delivery method itself in the community college concerning retention.

A major contributor to retention literature has been Tinto and his work in higher education. (Tinto, 1993) has written a student development theory that incorporates a student integration model. This theory proposes that students progress through stages as they evolve from being a first time in college student to a mature student. Variables that influence these stages are specifically academic and social integration. It is the interaction between these variables that predict student retention or, in other words, the decision whether or not a student will decide to stay or leave college in their first year (Tinto, 1993).

Theoretical Review

There are several retention theories regarding the reasons for students who drop out of school. Remedial courses offered at community colleges have made advances in course design of the online classes. Students are actively engaged by instructors, and must contribute to the educational process with active submission of work and communications (Palloff & Pratt, 2007). In the past, many saw online learning and instruction the same as traditional and approached course design in this manner (Stumpf et al., 2005).

There has been an increase in research and literature of 2-year colleges and the effects of remedial courses concerning graduation and retention rates. Recommendations to improve retention in online courses may include improvements in technology, content delivery, and accessibility (Fishman & New America, 2015). There is some suggestion that students can become very discouraged when classroom instruction is not well organized (Creasman, 2012). Some research agrees with those who may question the reliability of remedial coursework, however, half of all college students will enroll in

some remedial coursework, and there is evidence of its effectiveness being positive (Scott-Clayton & Rodriguez, 2015).

Community colleges must especially be vigilant in combating issues of negative or low retention and degree completion. Community colleges in comparison to other higher educational entities have fared worse concerning issues of low retention. Community college leaders are consistently addressing the needs of the developmental student as well as top level administration within the federal government. The Obama Administration's goal of increasing the number of community college graduates by five million by 2020 will require making significant progress in improving outcomes for students with weak and inadequate academic skills who enroll in community colleges (Bailey & Cho, 2010). There is also local concern concerning graduation completion. President Obama's initiative may place a burden on those colleges who provide remedial courses, by placing additional funding issues (Pretlow & Wathington, 2012).

There are many stakeholders within a community college's district who share a common concern, in regards to degree completion. When failure occurs, for students seeking a degree, certification, or goal attainment, it can be devastating to students and their families (Pruett & Absher, 2015). Concerned constituents may include board members located in the community college's district as well as other interest groups that may include numerous organizations and businesses who collaborate with the local community college in order to better determine needs in the community. Student support programs may manifest more potential for providing improvement in the academic outcomes of students concerning remedial coursework. Data from this research

determines that remediation alone, as it is currently delivered, is not effective in helping improve student outcomes when student support services are absent (Panlilio, 2013).

Remedial Retention Strategies at Community Colleges

Mississippi's 15 community and junior colleges are attempting to reduce the amount of remedial courses, especially those that are taken in sequence, and also provide a support system for students. This effort will hopefully pay dividends, by alleviating longer time-periods to graduation. The purpose of this design is an initiative to place some students who previously would have been forced to take a remedial course for no academic credit into credit-bearing English and math courses. The colleges would provide supporting labs to boost those borderline students' performance, in hopes of helping them succeed (Amy, 2014).

Entering freshman are not the only population who may be taking remedial courses at a community college. Traditional students may also find themselves enrolled in beginning mathematics courses as well as intermediate writing and reading classes. It is important to recognize, however, that community colleges may have an enrollment of a different demographic population with over half of their students being above the age of 25 (Fike & Fike, 2008). High Schools can also be helpful, for student success in remedial coursework. Entering freshman students may need less remedial work when they enter college if they complete academic core courses in high school (Creech & Southern Regional Education Board, 1997). Some community colleges do provide support systems to students who are enrolled in remedial courses. Instruction in the support centers covers subjects such as

English, mathematics, and reading. These support classes may be limited to 15 students, with instructors who are flexible, open to communication and effective. The support instructors are tasked with keeping students on track and motivated toward completing the goals (Korcheck, 1987).

Cost and Benefits of Remedial Courses

Mississippi Community Colleges as well as their local districts have an interest in the success and failures of remedial courses taken by students. Research that conducted a cost-benefit analysis of former students who had taken remedial courses determined that the results of community colleges that provided redial education courses had positive rewards concerning economic cost (Poole, 2012). While some may agree to the cost-benefit outcome of remedial course-work, there is some research to suggest differently. Community colleges are responsible for the majority of remedial course-work being offered at the postsecondary level. Although there is an increase in the number of remedial courses being offered, there is little data provided to manifest actual cost, and this lack of data could be promoting inadequate decisions by community college leaders as well as policy makers (Martinez, 2014). Some states may realize the enormous cost of remedial course offerings and have to make cuts. (Parker, 2007) describe 22 states reducing or completely dissolving remedial course offerings.

State educational leaders as well as policy makers should be aware of the funding that is spent on remedial education. For example, in Texas, for the 1996-1997 year the cost of developmental education that was spent on remedial education courses at the community college level was \$123 million (Breneman,

1998). With 42% of community college students taking at least one developmental course, it is estimated that \$3.45 billion nationally was spent educating developmental students at 2-year institutions for the 2000-01 academic year. (Pretlow & Wathington, 2012).

State legislators may place the burden of funding on community colleges, and to administer remedial course-work, even though those community colleges may have fewer or limited resources available (Bailey & Morest, 2006). State governments are tasked with providing the majority of funding for community colleges which are normally less funded than other educational entities in a state (Cohen & Brawer, 2008). The removal or cutting back on developmental course offerings could harm and deny those students who are in need of the courses (Jenkins & Boswell, 2002).

Some believe money spent toward remedial course work is well worth the money spent, and ensued costs are minimal. One study determined that colleges who are providing remedial education are not breaking the bank, and that policies focusing on remediation should not be based simply on considerations of cost (Breneman & Haarlow, 2016).

Student Participation in Remedial Courses

One particular study determines that remedial courses offered at two community colleges located in Massachusetts and one in Minnesota show very similar retention rates for students who took at least one remedial course as compared to students who did not take any remedial courses (The Challenges of

Remedial Education, 2006). The retention rate for the fall 2002 cohort after four semesters was 44%, and 46% for developmental students. Those remedial courses that may see the highest enrollment numbers are reading, writing, and mathematics courses. The placement of new entering freshmen students shows 55% being placed into developmental reading, 58% placement in developmental writing, and 70% placement in developmental mathematics (defined as precollege algebra; The Challenges of Remedial Education, 2006).

Many students may be hesitant to participate in the accelerated remedial course offerings, however, one study determined that those students who do enroll in the accelerated developmental English course during their first semester, are almost two and a half times likely to pass a remedial English course, yet only 16% of students participate in the developmental course (Mangan, 2014). Some community colleges may have several levels or sequence for a particular developmental course. Students may be reluctant to participate when being advised to enroll in the lowest level of the courses offerings. Many students may view enrolling in such developmental courses in sequence as being an obstacle to graduation plans. Developmental math courses are an example where many students can be placed in the remedial courses, however, many students may not pass the beginning sequence or lower level courses. An examination of Montgomery County Community College, located in Pennsylvania, determined that approximately 1,350 new students at Montgomery County who participated in a remedial math class in the fall of 2005, concluded that only about half passed (Blum, 2007). Many students are not only reluctant to participate in sequential remedial course offerings, they are also more

likely to drop out (Ashburn, 2009). Due to the research manifesting substantial variations among the different states and colleges in terms of the benefits students actually acquire from remedial classes, there is a need for more research needs to be done to figure out what policies work (Schmidt, 2008).

Summary

This chapter was a review of the literature related to remedial and developmental courses and their effects on student performance when transitioning into academic courses. The chapter also examined the current research on costs, for remedial course offerings as well as retention issues associated with remedial courses.

The review began with a consideration of the history and development and implementation of remedial course offerings by community colleges as well as high school and 4-year universities. This was followed by a brief consideration concerning the costs and effectiveness regarding any successes or failures of outcomes from students taking remedial courses. There seems to be a consensus that student retention in remedial courses are comparable to that of traditional classroom retention, and students may be reluctant to participate in remedial courses, and demonstrate displeasure especially where there may be a sequential structure, and developmental courses in English and Algebra courses are especially popular. In addition, a theoretical review determines that retention strategies by community colleges are implementing aspects such as online courses as well as the including of improvements in technology, content delivery, and accessibility.

More recent research suggests a growing popularity with k-12, community colleges, and 4-year universities offering remedial and developmental courses. What is noticeably available from the literature is empirical evidence of how remedial courses are affecting graduation rates, for any particular curriculum of study. Current research is also abundant concerning data, and the effects of students taking remedial courses at the community college level and their effects on completion of Associate of Applied Science degrees as well as Associate of Arts degrees. This gap in knowledge concerning the influence of the relationship between student performance in technical courses and their grades in remedial courses leaves open future research. Current empirical literature that was reviewed failed to manifest any studies concerning this gap in knowledge.

Based on the review of the literature, the gap in the knowledge that is the subject of the study has been researched. There appears to be an exceptional amount of research concerning the effects of remedial course-work on that of technical courses.

CHAPTER III

METHOD

Introduction

Chapter three of this study discusses the method and procedures used to facilitate the research in the study. The purpose of this study is to examine the relationship between student performance in technical courses and grades in remedial courses. This chapter includes a description of the research design, research questions, research site, population and sampling procedure, instruments, data collection procedures, and data analysis procedures.

Research Design

Multiple correlations of grades are calculated in Police Administration and Organization and Introduction to Criminal justice as dependent variables and in Beginning Algebra and Beginning English as independent variables. The following research questions are proposed in order to meet the purpose of the study:

Research Question One

What is the relationship of grades between Police Administration and Organization and Beginning Algebra?

Research Question Two

What is the relationship of grades between Police Administration and Organization and Beginning English?

Research Question Three

What is the relationship of grades between Introduction to Criminal Justice and Beginning Algebra?

Research Question Four

What is the relationship of grades between Introduction to Criminal Justice and Beginning English?

Research Question Five

What is the relationship between grades in police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables?

Research Question Six

What is the relationship between grades in Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables?

Data Collection

The total population of $n=45$ student's final grades in the four courses of Introduction to Criminal Justice, Police Administration and Organization, Beginning Algebra, and Beginning English are provided for the data of the study. All grades of

the participants are converted into numerical text. Letter grades of “A” are equal to 4, grades of “B” are converted to 3, grades of “C” are converted to 2, grades of “D” are converted to 1, and grades of “F” are converted to 0. All participants in this study have completed Beginning English and Beginning Algebra prior to completing Introduction to Criminal Justice and Police Administration and Organization.

Data Analysis

This study utilizes a Pearson Product Moment Coefficient of Correlation (Pearson r), and calculations on the basis of final grades, for $n=45$ students in a rural community college in Mississippi who have completed Police Administration and Organization, Introduction to Criminal Justice, Beginning Algebra, and Beginning English are analyzed. Multiple correlations of grades were calculated in Police Administration and Organization and introduction to Criminal justice as dependent variables and in Beginning Algebra and Beginning English as independent variables.

The two independent variables for this study are the final grades from the Beginning English and Beginning Algebra courses, and the two dependent variables for this study are the final grades from Introduction to Criminal Justice and Police Administration and Organization.

The study calculates a Pearson r in order to obtain the correlation of grades between Police Administration and Organization and Beginning Algebra. The study also calculates a Pearson r in order to obtain the correlation of grades between Police Administration and Organization and Beginning English. A calculation of a Pearson r is conducted in order to obtain any correlation between Introduction to Criminal Justice and

Beginning Algebra. The study also calculates a Pearson r in order to obtain the correlation of grades between Introduction to Criminal Justice and Beginning English.

In order to determine the inter-correlation of independent variables in the multiple correlations, a calculation of Pearson r is conducted in order to obtain the correlation of grades between Beginning Algebra and Beginning English. Also a calculation of a multiple correlation of grades for Police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables is conducted. A calculation for a multiple correlation of grades for Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables is also conducted. A scatter plot is conducted, for each calculation of Pearson r . The scatter plots for each calculation also contains a regression line, and visually identifies any relationships which may be negative, positive, or no correlation between the independent and dependent variables in the study.

Summary

Chapter three provided an overview of the research methods and data analysis for this study. This chapter included a description of the research design, data source, data collection, and statistical techniques. The purpose of this study was to examine the relationship between student performance in technical courses and grades in remedial courses at a rural community college.

CHAPTER IV

ANALYSIS OF DATA

Introduction

The purpose of this study was to examine the relationship between student performance in technical courses and grades in remedial courses. The following research questions were answered in order to meet the purpose of the study:

1. What is the relationship of grades between Police Administration and Organization and Beginning Algebra?
2. What is the relationship of grades between Police Administration and Organization and Beginning English?
3. What is the relationship of grades between Introduction to Criminal Justice and Beginning Algebra?
4. What is the relationship of grades between Introduction to Criminal Justice and Beginning English?
5. What is the relationship between grades in police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables?

6. What is the relationship between grades in Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables?

Table 1

Final Participant Grades

| Student | CRJ 1313 Introduction to Criminal Justice | CRJ 1323 Police Administration & Organization | Beginning Algebra | Beginning English |
|------------|---|---|-------------------|-------------------|
| Student 1 | 4 | 4 | 3 | 2 |
| Student 2 | 2 | 3 | 3 | 3 |
| Student 3 | 3 | 3 | 2 | 4 |
| Student 4 | 2 | 2 | 3 | 1 |
| Student 5 | 4 | 4 | 2 | 2 |
| Student 6 | 3 | 3 | 0 | 3 |
| Student 7 | 2 | 2 | 1 | 2 |
| Student 8 | 3 | 3 | 2 | 3 |
| Student 9 | 3 | 2 | 2 | 3 |
| Student 10 | 2 | 2 | 0 | 2 |
| Student 11 | 2 | 2 | 4 | 2 |
| Student 12 | 3 | 3 | 4 | 3 |
| Student 13 | 2 | 1 | 2 | 0 |
| Student 14 | 4 | 3 | 1 | 2 |
| Student 15 | 3 | 4 | 2 | 2 |
| Student 16 | 2 | 3 | 1 | 2 |
| Student 17 | 3 | 4 | 2 | 3 |
| Student 18 | 4 | 3 | 2 | 3 |
| Student 19 | 3 | 2 | 3 | 1 |
| Student 20 | 4 | 4 | 2 | 3 |
| Student 21 | 3 | 1 | 2 | 2 |
| Student 22 | 4 | 4 | 3 | 4 |
| Student 23 | 2 | 3 | 2 | 3 |
| Student 24 | 3 | 2 | 1 | 2 |
| Student 25 | 2 | 3 | 4 | 3 |
| Student 26 | 4 | 4 | 3 | 4 |
| Student 27 | 4 | 3 | 3 | 3 |
| Student 28 | 2 | 3 | 3 | 2 |
| Student 29 | 4 | 4 | 2 | 4 |
| Student 30 | 4 | 3 | 3 | 4 |
| Student 31 | 3 | 4 | 2 | 4 |
| Student 32 | 2 | 1 | 1 | 2 |
| Student 33 | 3 | 2 | 2 | 3 |
| Student 34 | 1 | 2 | 1 | 2 |
| Student 35 | 4 | 4 | 2 | 4 |
| Student 36 | 3 | 3 | 2 | 3 |
| Student 37 | 2 | 2 | 1 | 2 |
| Student 38 | 4 | 3 | 2 | 3 |
| Student 39 | 2 | 3 | 4 | 4 |
| Student 40 | 3 | 2 | 2 | 3 |
| Student 41 | 4 | 4 | 1 | 2 |
| Student 42 | 3 | 3 | 4 | 3 |
| Student 43 | 2 | 2 | 2 | 3 |
| Student 44 | 2 | 0 | 3 | 4 |
| Student 45 | 1 | 2 | 2 | 2 |
| | | | | |
| | A=4 | | | |
| | B=3 | | | |
| | C=2 | | | |
| | D=1 | | | |
| | F=0 | | | |

Table 1 presents the final grades of the participants, and are converted into numerical text. These data from Table 1 were utilized for all six research questions of the study. Letter grades of “A” will be equal to 4, grades of “B” will be converted to 3, grades of “C” will be converted to 2, grades of “D” will be converted to 1, and grades of “F” will be converted to 0. All participants in this study have completed Beginning English and Beginning Algebra prior to completing the technical courses of Introduction to Criminal Justice and Police Administration and Organization.

The study calculated Pearson r in order to obtain the correlation of grades between Police Administration and Organization and Beginning Algebra. The study calculates Pearson r in order to obtain the correlation of grades between Police Administration and Organization and Beginning English. A calculation on Pearson r was conducted in order to obtain any correlation between Introduction to Criminal Justice and Beginning Algebra. The study also calculates Pearson r in order to obtain the correlation of grades between Introduction to Criminal Justice and Beginning English.

In order to determine the inter-correlation of independent variables in the multiple correlations, a calculation of Pearson r was conducted in order to obtain the correlation of grades between Beginning Algebra and Beginning English. Also, a calculation of a multiple correlation of grades for Police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables was conducted. A calculation of a multiple correlation of grades for Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables was conducted. A scatter plot was

conducted, for each calculation of Pearson r . The scatter plots for each calculation contains a regression line, and visually identifies any relationships which may be negative, positive, or no correlation between the independent and dependent variables in the study.

Research Question One

Research question one: What is the relationship of grades between Police Administration and Organization and Beginning Algebra? Data for question one were extracted from the learning management system, Canvas, at the aggregate course level for final student grades. For this research question the independent variable was the final student grades from the remedial course Beginning Algebra and the dependent variable was the final student grades from the technical course Police Administration and Organization. A Pearson Product Moment of Coefficient Correlation was conducted to measure the strength of the association between the two variables. Findings from this analysis were presented in Table 2. According to the output generated from the Pearson Product Moment of Coefficient Correlation, a slight positive correlation of [$r=.11$, $n=45$, $p=.45$] is determined. The scatterplot in Figure 1 summarizes the findings.

The research hypothesis for this question was there would be a positive correlation between the technical course of Police Administration and Organization, and the remedial course Beginning Algebra. The researcher expected the better final grades of students in the remedial course are, the better final grades would be in the technical course. Based on the findings, the researcher determines a slight positive correlation between the two variables. Table 2 shows the Pearson Product Moment of Coefficient Correlation with a 95% confidence interval.

Table 2

Correlations of Variables

| | | PoliceAdmi n | BegAl |
|-----------------|------------------------|-----------------|-------|
| PoliceAdmi n | Pearson Correlation | 1 | .114 |
| | Sig. (2-tailed) | | .455 |
| | N | 45 | 45 |
| BegAl | Pearson Correlation | .114 | 1 |
| | Sig. (2-tailed) | .455 | |
| | N | 45 | 45 |

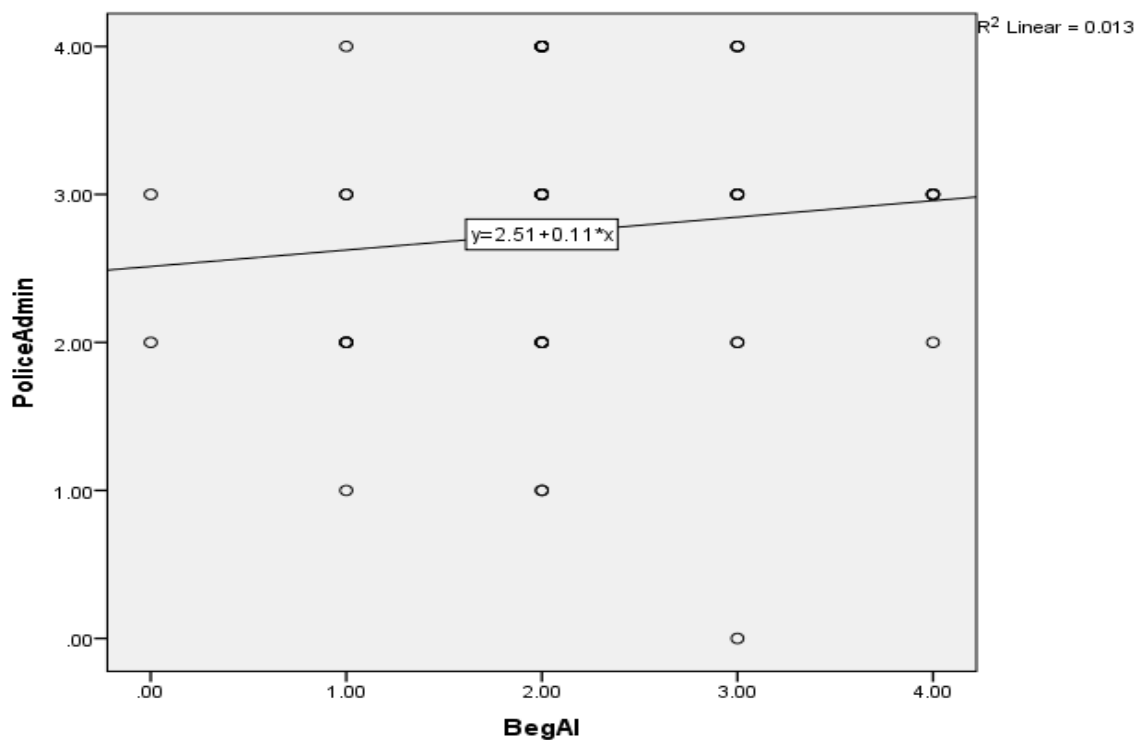


Figure 1. Correlation results between Beginning Algebra and Police Administration and Organization

Research Question Two

Research question two: What is the relationship of grades between Police Administration and Organization and Beginning English? Data for question two were extracted from the learning management system, Canvas, at the aggregate course level for final student grades. For this research question the independent variable was the final student grades from the remedial course Beginning English and the dependent variable was the final student grades from the technical course Police Administration and Organization. A Pearson Product Moment of Coefficient Correlation was conducted to measure the strength of the association between the two variables. Findings from this analysis were presented in Table 3. According to the output generated from the Pearson Product Moment of Coefficient Correlation, a slight positive correlation of [$r=.39$, $n=45$, $p=.008$] is determined. The scatterplot in Figure 2 summarizes the findings.

The research hypothesis for this question was there would be a positive correlation between the technical course of Police Administration and Organization, and the remedial course Beginning English. The researcher expected the better final grades of students in the remedial course are, the better final grades would be in the technical course. Based on the findings, the researcher determines a slight positive correlation between the two variables. Table 3 shows the Pearson Product Moment of Coefficient Correlation with a 95% confidence interval.

Table 3

Correlation of Variables

| | | PoliceAdmi | BegEng |
|------------|-----------------|------------|--------|
| | | n | |
| PoliceAdmi | Pearson | 1 | .390** |
| | Correlation | | |
| | Sig. (2-tailed) | | .008 |
| | N | 45 | 45 |
| BegEng | Pearson | .390** | 1 |
| | Correlation | | |
| | Sig. (2-tailed) | .008 | |
| | N | 45 | 45 |

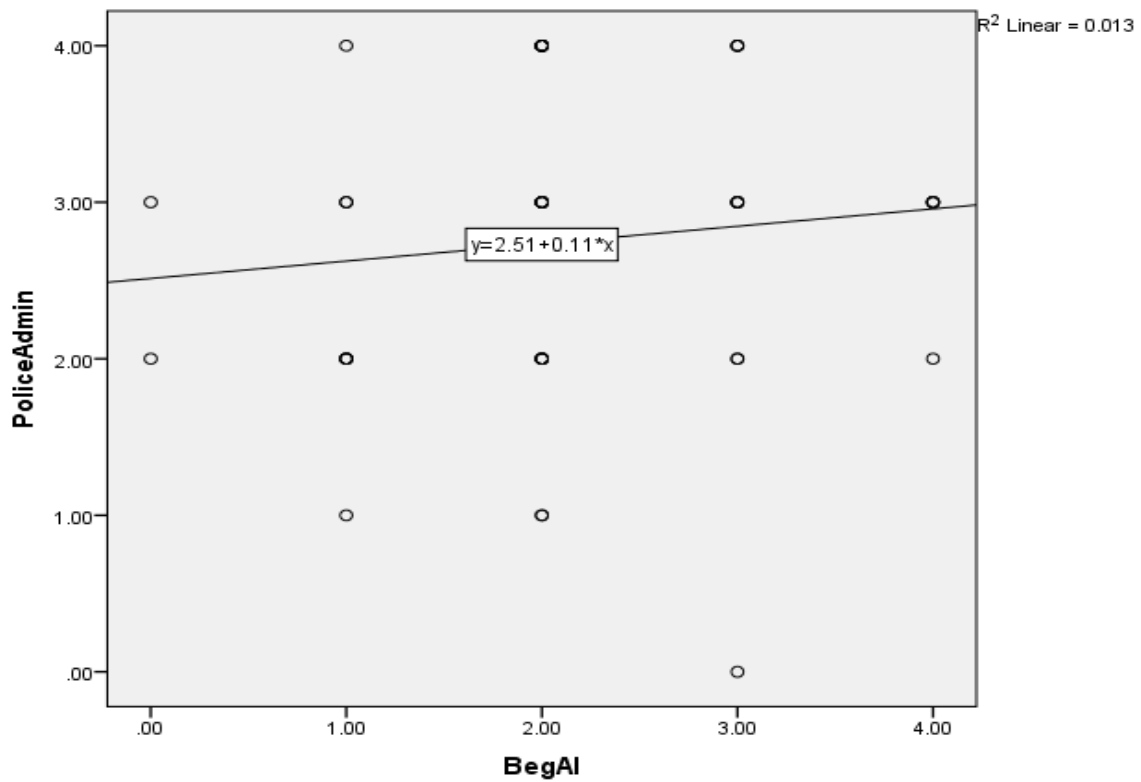


Figure 2. Correlation results between Beginning English and Police Administration and Organization.

Research Question Three

Research question three: What is the relationship of grades between Introduction to Criminal Justice and Beginning Algebra? Data for question three were extracted from the learning management system, Canvas, at the aggregate course level for final student grades. For this research question the independent variable was the final student grades from the remedial course Beginning Algebra and the dependent variable was the final student grades from the technical course Introduction to Criminal Justice. A Pearson Product Moment of Coefficient Correlation was conducted to measure the strength of the association between the two variables. Findings from this analysis were presented in Table 4. According to the output generated from the Pearson Product Moment of Coefficient Correlation, a slight positive correlation of [$r=.05$, $n=45$, $p=.73$] is determined.

The research hypothesis for this question was there would be a positive correlation between the technical course of Introduction to Criminal Justice, and the remedial course Beginning Algebra. The researcher expected the better final grades of students in the remedial course are, the better final grades would be in the technical course. Based on the findings, the researcher determines a slight positive correlation between the two variables. The scatterplot in Figure 3 summarizes the findings. Table 4 shows the Pearson Product Moment of Coefficient Correlation with a 95% confidence interval.

Table 4

Correlation of Variables

| | | IntrotoC | BegAl |
|---------------|---------------------|----------|-------|
| | | J | |
| IntrotoC J | Pearson Correlation | 1 | .052 |
| | Sig. (2-tailed) | | .734 |
| | N | 45 | 45 |
| BegAl | Pearson Correlation | .052 | 1 |
| | Sig. (2-tailed) | .734 | |
| | N | 45 | 45 |

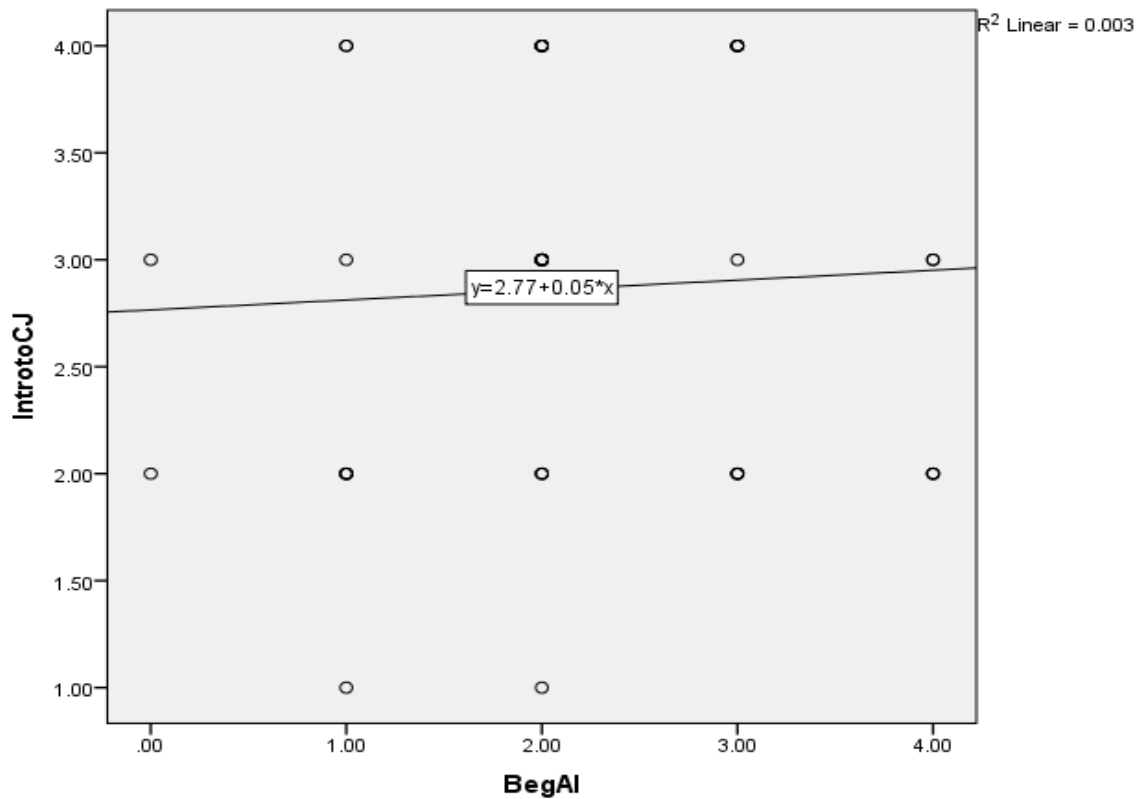


Figure 3. Correlational relationship of grades between Introduction to Criminal Justice and Beginning Algebra.

Research Question Four

Research question four: What is the relationship of grades between Introduction to Criminal Justice and Beginning English? Data for question four were extracted from the learning management system, Canvas, at the aggregate course level for final student grades. For this research question the independent variable was the final student grades from the remedial course Beginning English and the dependent variable was the final student grades from the technical course Introduction to Criminal Justice. A Pearson Product Moment of Coefficient Correlation was conducted to measure the strength of the association between the two variables. Findings from this analysis were presented in Table 5. According to the output generated from the Pearson Product Moment of Coefficient Correlation, a slight positive correlation of [$r=.36$, $n=45$, $p=.01$] is determined. The scatterplot in Figure 4 summarizes the findings.

The research hypothesis for this question was there would be a positive correlation between the technical course of Introduction to Criminal Justice, and the remedial course Beginning English. The researcher expected the better final grades of students in the remedial course are, the better final grades would be in the technical course. Based on the findings, the researcher determines a slight positive correlation between the two variables. Table 5 shows the Pearson Product Moment of Coefficient Correlation with a 95% confidence interval.

Table 5

Correlation of Variables

| | | IntrotoCJ | BegEng |
|-----------|---------------------|-----------|--------|
| IntrotoCJ | Pearson Correlation | 1 | .361* |
| | Sig. (2-tailed) | | .015 |
| | N | 45 | 45 |
| BegEng | Pearson Correlation | .361* | 1 |
| | Sig. (2-tailed) | .015 | |
| | N | 45 | 45 |

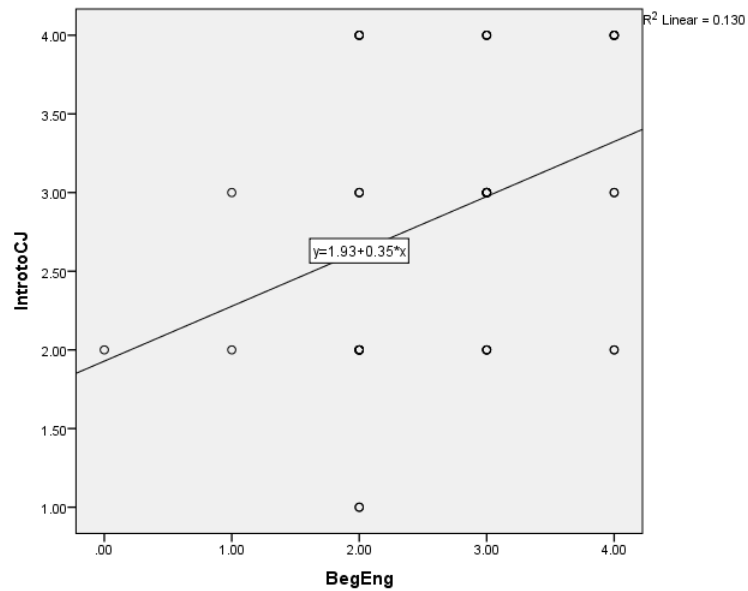


Figure 4. Correlational relationship between Introduction to Criminal Justice and Beginning English.

Research Question Five

Research question five: What is the relationship between grades in Police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables? Data for question five were extracted from the learning management system, Canvas, at the aggregate course level for final student grades. For this research question the independent variable was the final student grades from the remedial courses Beginning English and Beginning Algebra and the dependent variable was the final student grades from the technical course Police Administration and Organization.

A Pearson Product Moment of Coefficient Multiple Correlation was conducted to measure the strength of the association between the three variables. Findings from this analysis were presented in Table 6. According to the output generated from the Pearson Product Moment of Coefficient Multiple Correlation, a slight positive correlation of [$r=.10$, $n=45$] is determined between Police Administration and Organization and Beginning Algebra. The scatterplot in Figure 5 summarizes the findings.

The research hypothesis for this question was there would be a positive correlation between the technical course of Police Administration and Organization, and the remedial courses Beginning English and Beginning Algebra. The researcher expected the better final grades of students in the remedial courses are, the better final grades would be in the technical course. Based on the findings, the researcher determines a slight positive correlation between the three variables. Table 6 shows the Pearson Product Moment of Coefficient Multiple Correlation with a 95% confidence interval.

Table 6

Correlation of Multiple Variables

| | | PoliceAdmi n | BegAl | BegEng |
|-----------------|------------------------|-----------------|-------|--------|
| PoliceAdmi n | Pearson Correlation | 1 | .114 | .390** |
| | Sig. (2-tailed) | | .455 | .008 |
| | N | 45 | 45 | 45 |
| BegAl | Pearson Correlation | .114 | 1 | .256 |
| | Sig. (2-tailed) | .455 | | .090 |
| | N | 45 | 45 | 45 |
| BegEng | Pearson Correlation | .390** | .256 | 1 |
| | Sig. (2-tailed) | .008 | .090 | |
| | N | 45 | 45 | 45 |

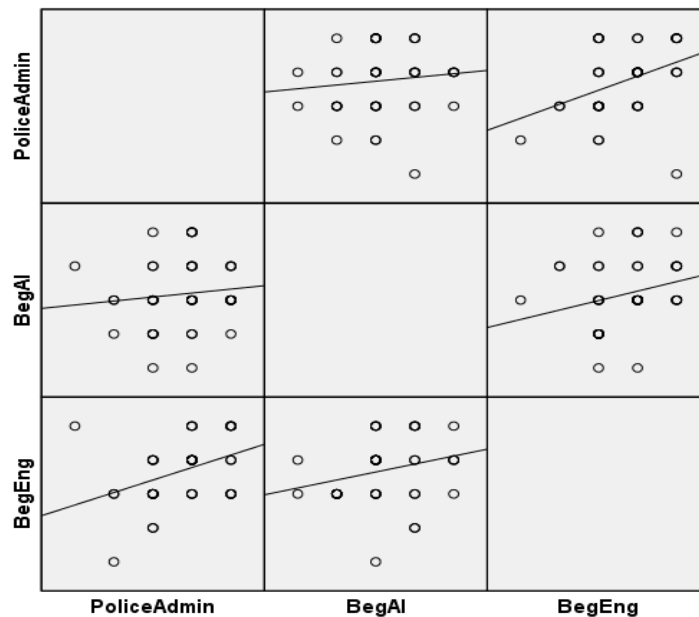


Figure 5. Correlational relationship between grades in Police Administration and Organization as the dependent variable and Beginning Algebra and Beginning English as the independent variables.

Research Question Six

Research question six: What is the relationship between grades in Introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables? Data for question six were extracted from the learning management system, Canvas, at the aggregate course level for final student grades. For this research question the independent variable was the final student grades from the remedial courses Beginning English and Beginning Algebra and the dependent variable was the final student grades from the technical course introduction to Criminal Justice.

A Pearson Product Moment of Coefficient Multiple Correlation was conducted to measure the strength of the association between the three variables. Findings from this analysis were presented in Table 7. According to the output generated from the Pearson Product Moment of Coefficient Multiple Correlation, a slight positive correlation of $[r=.10, n=45]$ is determined between Introduction to Criminal justice and Beginning Algebra. The scatterplot in Figure 6 summarizes the findings.

The research hypothesis for this question was there would be a positive correlation between the technical course of Introduction to Criminal Justice, and the remedial courses Beginning English and Beginning Algebra. The researcher expected the better final grades of students in the remedial courses are, the better final grades would be in the technical course. Based on the findings, the researcher determines a slight positive correlation between the three variables. Table 7 shows the Pearson Product Moment of Coefficient Multiple Correlation with a 95% confidence interval.

Table 7

Correlation of Multiple Variables

| | | BegAl | BegEng | IntrotoC J |
|---------------|---------------------|-------|--------|---------------|
| BegAl | Pearson Correlation | 1 | .256 | .052 |
| | Sig. (2-tailed) | | .090 | .734 |
| | N | 45 | 45 | 45 |
| BegEng | Pearson Correlation | .256 | 1 | .361* |
| | Sig. (2-tailed) | .090 | | .015 |
| | N | 45 | 45 | 45 |
| IntrotoC J | Pearson Correlation | .052 | .361* | 1 |
| | Sig. (2-tailed) | .734 | .015 | |
| | N | 45 | 45 | 45 |

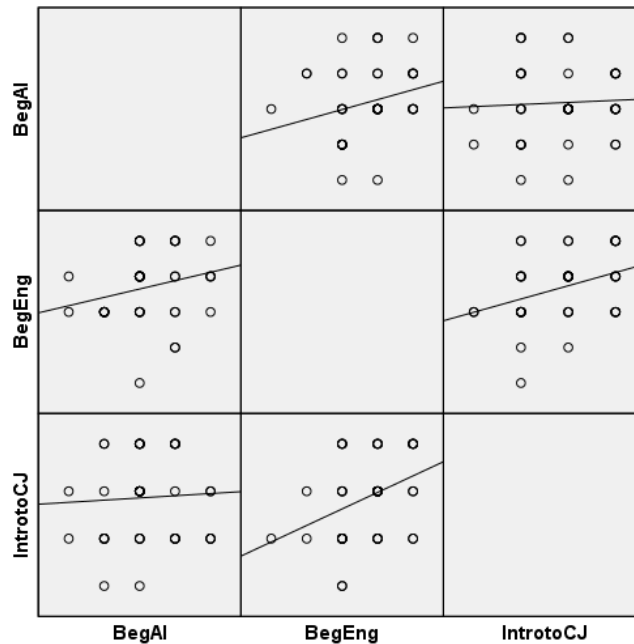


Figure 6. Correlational relationship between grades in Police introduction to Criminal Justice as the dependent variable and Beginning Algebra and Beginning English as the independent variables.

Summary

Chapter four presented the results of the analysis of the data. Correlations as well as multiple correlations were reported for the four variables included in the study. Overall, the independent variables were slightly significantly correlated with each other in a positive direction. The independent variables were positively associated with the dependent variables. The associations were all positive between the independent variables Beginning Algebra, and Beginning English and the dependent variables introduction to Criminal Justice and Police Administration and Organization.

In general, the findings suggest that there is a slight to minimum positive correlation between the two dependent variables of Introduction to Criminal Justice, and Police administration and Organization, and the two independent variables of Beginning Algebra and Beginning English. Research questions one through six were answered using Pearson Product Moment of Coefficient (Pearson r). Overall, there were minimal positive significant differences between the correlations of the four variables (introduction to Criminal Justice, Police Administration and Organization, Beginning Algebra, and Beginning English). The findings of this data analysis do support the research hypotheses concerning the influence that developmental courses have on student's final grades in technical courses. Chapter five will present a summary of the study, conclusions, and recommendations for further study.

CHAPTER V CONCLUSIONS

Introduction

This chapter presents a summary of the research, discussion, and recommendations for further study. The purpose of this study was to examine the relationship between student performance in technical courses and grades in remedial courses. Correlation differences were measured between the two independent variables of Beginning English and Beginning Algebra, and the two dependent variables of Introduction to Criminal Justice and Police administration and Organization. Data for this study were pulled from courses taught at ICC, and consist of student's final grades. The following research question was proposed in order to meet the purpose of the study: Is there a relationship between student performance in technical courses and grades in remedial courses?

Summary

Research question one focused on the relationship between Police Administration and Organization, and Beginning Algebra as the independent variable. A Pearson r was conducted to compare the differences between the final grades of student's in Police Administration and Organization and Beginning Algebra. Overall, the findings reveal there is a statistically significant correlation between these two variables.

Research question two focused on the relationship between Police Administration and Organization, and Beginning English as the independent variable. A Pearson r was conducted to compare the differences between the final grades of students in Police Administration and Organization and Beginning English. Overall, the findings conclude that there is a statistically significant correlation between these two variables.

Research question three focused on the relationship between Introduction to Criminal Justice, and Beginning Algebra as the independent variable. A Pearson r was conducted to compare the differences between the final grades of students in Police Administration and Organization and Beginning Algebra. Overall, the findings determine there is a statistically significant correlation between these two variables.

Research question four focused on the relationship between Introduction to Criminal Justice, and Beginning English as the independent variable. A Pearson r was conducted to compare the differences between the final grades of students in Police Administration and Organization and Beginning English. Overall, the findings determined that that there is a statistically significant correlation between these two variables.

Research question five concentrated on the relationship between Police Administration and Organization, and Beginning English and Beginning Algebra as the independent variables. A Pearson r was conducted to compare the differences between the final grades of students in Police Administration and Organization and Beginning English and Beginning Algebra. Overall, the findings were that there is a statistically significant correlation between these three variables.

Research question six concentrated on the relationship between Introduction to Criminal Justice, and Beginning English and Beginning Algebra as the independent variables. A Pearson r was conducted to compare the differences between the final grades of student's in Police Administration and Organization and Beginning English and Beginning Algebra. Overall, the findings were that there is a slight positive statistically significant correlation between these three variables.

Discussion

The research hypothesis for this question was there would be a positive correlation between the technical courses of Introduction to Criminal Justice, and Police Administration and Organization the remedial courses Beginning English and Beginning Algebra. In agreement with the findings in this study, the literature supported the hypothesis that remedial courses do provide future student success in technical coursework (Scott-Clayton & Rodriguez, 2015).

The findings demonstrate as the student final grades, as defined by the independent variables increased, there is a corresponding increase in the dependent variables. In summary, the analysis did support the research hypothesis, in that there were statistically significant relationships between the independent variables Beginning Algebra and Beginning English, and the dependent variables Introduction to Criminal Justice and Police Administration and Organization.

Limitations

There were limitations in the current study that may have influenced the outcome of the analysis, and further discussion below will suggest future research to address. One limitation in particular was that this study was restricted to only one technical program at a rural, public 2-year community college in Mississippi. Another limitation of this study that could have possibly had an impact on the results is the possible lack of student's understanding of technology with online courses which may affected the impact of the internal validity concerning the results. Finally, the communication between instructors who may have knowledge of student's rationale for withdrawing or not completing an online course.

Recommendations

Research for community college's concerning remedial course offerings will continue to a prevalent issue as enrollment increases and technical programs grow (Cohen, Kisker & Brawer, 2013). Limitations offered by this study provide opportunities for future research concerning remedial courses, and their effect on technical programs at community colleges. Many communities may differ greatly in the type of technical training needed to meet industry needs (Ruppel, 2012). There is a recommendation for future research as this research concentrates on the 2013-2014 academic school year. It may be beneficial to also analyze other rural community colleges who also offer a Law Enforcement Technology curriculum.

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APPENDIX A
PERMISSION LETTER FROM INSTITUTIONAL RESEARCH BOARD AT
ITAWAMBA COMMUNITY COLLEGE



October 11, 2016

Charles "Bo" Rowland
50037 Beaver Road
Aberdeen, MS 39730

Re: Itawamba Community College IRB Approval
"THE RELATIONSHIP BETWEEN STUDENT PERFORMANCE IN TECHNICAL COURSES AND GRADES IN REMEDIAL COURSES"

Dear Bo Rowland:

The above referenced project/research topic was reviewed and approved on October 11, 2016. This project is approved until December 1, 2017.

You are given permission to collect de-identified final course grades from two technical courses (CRJ 1313- Introduction to Criminal Justice and CRJ 1323-Police Administration and Organization) that you taught and from two remedial courses (MAT 1213-College Math I and ENG 0113-Beginning English) taught by other instructors. The grades used will be from the 2013-2014 academic year. The Chief Academic Officer at ICC has written a letter of support for your research and will provide access to the remedial course grades. This permission reflects the information as submitted in your IRB form.

Good luck to you in conducting this research project. If you have questions or concerns, please contact me at 662-862-8265 or at etedwards@iccms.edu.

Sincerely yours,

Elizabeth J. Edwards

Elizabeth Edwards
Director of Institutional Research & Accountability

602 West Hill Street • Fulton, Mississippi 38843 • 662.862.8000

APPENDIX B

PERMISSION LETTER FROM CHIF ACADEMIC OFFICER AT ITAWAMBA
COMMUNITY COLLEGE

October 24, 2016

Charles "Bo" Rowland
50037 Beaver Road
Aberdeen, MS 39730

Re: Letter of Support
**"THE RELATIONSHIP BETWEEN STUDENT PERFORMANCE IN TECHNICAL
COURSES AND GRADES IN REMEDIAL COURSES"**

Dear Mr. Rowland,

This letter is in support of the above referenced research. You are given permission to access the grades from two remedial courses (MAT 1213-College Math I and ENG 0113-Beginning English) during the 2013-1014 academic year.

Please let me know if you need further assistance and good luck on your research.

Sincerely,

Michelle Sumnerel

Michelle Sumnerel
Vice President of Instruction

602 West Hill Street • Fulton, MS 38843

APPENDIX C

PERMISSION LETTER FROM INSTITUTIONAL RESEARCH BOARD AT
MISSISSIPPI STATE UNIVERSITY



MISSISSIPPI STATE
UNIVERSITY™

Office of Research Compliance

Institutional Review Board for the Protection of
Human Subjects in Research
P.O. Box 6223
53 Morgan Avenue
Mississippi State, MS 39762
P. 662.325.3294

www.orc.msstate.edu

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE: October 31, 2016

TO: Rowland, Charles, Educational Leadership

FROM: Roberts, Jodi, HRPP Officer, MSU HRPP

PROTOCOL TITLE: THE RELATIONSHIP BETWEEN STUDENT PERFORMANCE

IN TECHNICAL COURSES

AND GRADES IN REMEDIAL COURSES

PROTOCOL NUMBER: IRB-16-450

Approval Date: October 31, 2016 Expiration Date: October 16, 2017

This letter is your record of the Human Research Protection Program (HRPP) approval of this study as exempt.

On October 31, 2016, the Mississippi State University Human Research Protection Program approved this study as exempt from federal regulations pertaining to the protection of human research participants. The application qualified for exempt review under CFR 46.101(b)(4).

Exempt studies are subject to the ethical principles articulated in the Belmont Report, found at www.hhs.gov/ohrp/regulations-and-policy/belmont-report/#

If you propose to modify your study, you must receive approval from the HRPP prior to implementing any changes. The HRPP may review the exempt status at that time and request an amendment to your application as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so.

The MSU IRB approval for this project will expire on October 16, 2017. If you expect your project to continue beyond this date, you must submit an application for renewal of this HRPP approval. HRPP approval must be maintained for the entire term of your project. Please notify the HRPP when your study is complete. Upon notification, we will close our files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact the HRPP by phone at 325.3994 or email irb@research.msstate.edu.

We wish you success in carrying out your research project.

Roberts, Jodi

Review Type: EXEMPT

IRB Number: IORG0000467