

Inclusive Access Course Materials:

The Impact on Student Outcomes

By

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## Abstract

The rising cost of course materials over the last 20 years has had a negative impact on student finances, higher education choices, and grades. Two recent models have emerged to help increase student access to course materials while driving down acquisition costs – third party open educational resources and publisher content driven inclusive access programs. The potential impact of open educational resources on student outcomes has been widely studied. However, the potential impact of inclusive access programs on student outcomes has been studied less so. The intent of this quantitative correlational research study was to examine the relationship of student outcomes for students who had their required course materials provided on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. Study population size was 2,550 ( $N=2550$ ). Data analysis techniques used in this study include chi-square test of independence and independent t-tests with a standard p-value of .05. Results of the data analysis revealed varying improvement in the increase in the number and percentages of students who passed a class with a letter grade ‘C’ or better when their required course materials were provided as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. Furthermore, the results of chi-square and t-tests, provided insight into any statistically significant relationships between student populations who were enrolled in courses using an inclusive access program and student populations who had the responsibility to source their own required course materials.

*Keywords:* inclusive access, course materials, textbooks, open educational resources, chi-square

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## **Chapter 1: Introduction to the Study and Theoretical Framework**

Students in colleges and universities in United States are responsible for sourcing their own required course materials. The most prevalent course materials acquisition model in higher education is a process where faculty and departments make course materials choices and communicate those selections to their campus bookstores; bookstores then order the materials for their shelves (U.S. Government Accountability Office, 2005). In this process, students are responsible for navigating the campus bookstore (or the Internet) in search of the required material (U.S. Government Accountability Office, 2013). However, there are emerging trends within higher education and the textbook industry that are designed to remove the responsibility from students of having to source their own course materials. These trends also reduce the costs students incur for their course materials (Hilton III et al., 2014; Follett, 2015a). Reducing the cost of course materials acquisition is important considering that the costs of course materials have outpaced inflation over the last 20 years – costing students up to \$1,300 per academic year, even when considering digital and textbook rental options (Achieving the Dream, 2013; Agnihotri et al., 2017; College Board, 2018; Hendricks et al., 2017; Johnson, 2019; Senack, 2014b; U.S. Government Accountability Office, 2013). The cost of students' required course materials affects their decisions about whether or not to buy the course materials or delay a course (Florida Virtual Campus, 2016; Textbooks Included, 2012). Delaying the purchase of students' required course materials can have a negative impact on their ability to pass a course (Florida Virtual Campus, 2016).

One emerging trend is the use of open educational resources, often referred to as OER. Open educational resources are public domain textbooks and other educational materials that students can access for little or no cost (Fischer et al., 2015; William and Flora Hewlett

Foundation, 2016). Student can access their OER course materials via website downloads or can be provided by instructors through the campus learning management system (Feldstein et al., 2012).

Another emerging trend is the practice of textbook management companies partnering with campus administrators to provide each enrolled student with their required course materials on or before the first day of class, an inclusive access model/program (Follett 2015a; 2015b; 2015c; Hurley, 2020; Pace-Scrivener, 2014; Textbooks Included, 2012). Students save money on their required course materials because bookstore management companies and/or campus partners negotiate pricing with publishers to reduce the cost of course materials for all students enrolled in a course or program (Pace-Scrivener, 2014).

This quantitative research study was designed to explore whether or not access and earlier access to required course materials prior to the beginning of the academic term, as part of an inclusive access program, positively impacts student outcomes.

### **The Research Problem**

The process for students to acquire the course materials through their bookstores may result in students not obtaining their course materials before the start of class or at all. Only about 28% of students have all their required course materials on or before the first day of class (Textbooks Included, 2012) and over 60% of students decide to not acquire one or more of their required course materials (Florida Virtual Campus, 2016). However, it is a rather universal understanding that having the required course materials is essential for connecting to lecture and discipline concepts (Landrum et al., 2006). Without the required course materials, students can fall behind in their coursework (Florida Virtual Campus, 2016). Meanwhile, an industry survey reported that 77% of instructors use the required textbooks in every class (Textbooks Included,

2012). Currently, little research has been done that seeks to understand how providing students with their required course materials on or before the first day of class, as part of an inclusive access program, affects their in-class success.

### **Research Justification**

Institutions can ensure that each enrolled student has the same access to course material if they arrange to provide students the required course materials on or before the first day of class as part of an inclusive access program (Florida Virtual Campus, 2016; Skinner & Howes, 2013). An industry-leading bookstore management firm survey found that 83% of students whom they surveyed responded that they would like to get their course materials as part of their tuition and that having their own textbook for each course helps them to achieve a better grade (Textbooks Included, 2012).

### **Deficiencies in Evidence**

Current course materials research literature extensively examines student preparation for class, student preparedness or unpreparedness for class, and how little students read before classes or examinations. However, there is a limited research on the timing of student access to course materials (Aagaard et al., 2014; Berry et al., 2010; Burchfield & Sappington, 2000; Clump et al., 2004; French et al., 2015; Landrum et al., 2012; Vafeas, 2013). There is little research on the impact of providing students with their required course materials on or before the first day of class as part of an inclusive access program (Hurley, 2020). The lack of research literature on the practice of providing students with their required course materials on or before the first day of class as part of an inclusive access program suggests this is an area where research is needed.

### **Significance**

The National Association of College Stores surveyed over 10,000 college and university students about their textbook purchasing decisions, both through the campus bookstore and other retailers (OnCampus Research, 2012). Results of that study revealed that 24% of students waited until after classes began to secure their required course materials. Only 13% of students purchased their required course materials a month before class started (OnCampus Research, 2012). Considering the issues faced by students who are underprepared for college (Civitas Learning, 2016; Crisp & Nora, 2010; Feldman, 1993; Nakajima et al., 2012), the National Association of College Stores survey can set up a challenging dynamic as students work to connect to their course work and to instructor-directed readings, exams, and projects. Students' access to their required course materials is critical, according to Gershenfeld et al, (2016), who tied low grade-point average to a greater risk of a student not persisting to graduation. Retention has been, and remains, a challenge for college and universities (McGrath & Braunstein, 1997; Reason et al., 2006; Tinto, 1975). This suggests the need for students to secure their required course materials prior to the beginning of their courses.

Researchers have suggested that the cost and acquisition process of course materials can contribute to student attrition (David et al., 2015; Davila, 2011; Florida Virtual Campus, 2016; Jobe, 2011). The practice of providing students with their required course materials on or before the first day of class, as part of an inclusive access program, removes a potential barrier to their success. Independent of other issues central to grades, completion, and retention (Chan, 2017, Crisp & Nora, 2010; Davila, 2011; Feldman, 1993; Glenn, 2003; McGrath & Braunstein, 1997; Nakajima et al., 2012; Reason et al., 2006) providing students with their required course materials on or before the first day of class, as part of an inclusive access program, may have implications for in-class success and better grade attainment for college and university students.

## **Purpose Statement**

The purpose of this quantitative, correlational study is to examine the impact on student outcomes when community college students are provided their required course materials on or before the first day of class as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. The study seeks to provide evidence as to whether or not this concept leads to an increase in the number and percentage of students who pass a course with a letter grade ‘C’ or better.

## **Central Research Question**

- To what extent do students pass a class with a letter grade ‘C’ or better when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials?

## **Secondary Research Questions**

- To what extent do students pass a class with a letter grade ‘C’ or better when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials, when comparisons are made by gender and race?
- To what extent do students earn a grade of incomplete or withdraw from a course when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials?

- To what extent do students save money when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials?

### **Theoretical Framework**

Vroom's (1995) Expectancy Theory was chosen as the theoretical framework for this study. Expectancy Theory extends its historical roots from the hedonistic doctrine. The hedonistic doctrine "can be traced back to the Greek philosophers as well as to the writings of English utilitarians like Jeremy Bentham and John Stuart Mill" (Vroom, 1995, p. 11) and assumes that a person's actions are driven towards pleasure and away from pain (Bandura, 1977; Reinharth & Wahba, 1975; Vroom, 1995). The hedonistic doctrine supposes that under all conditions, people will "select from alternative possibilities the course of action that they think will maximize their pleasures and minimize their pain" (Vroom, 1995, p. 11). Vroom (1995) has extended the principles of hedonism through his Expectancy Theory.

Vroom's (1995) Expectancy Theory has been widely used to research motivation in employees in the business sector (Heneman & Schwab, 1972; Reinharth & Wahba, 1975). Expectancy theory, at its core, is a model used to understand what motivates employees to engage in behavior that produces a particular result linked to a reward deemed important to the employee. Expectancy theory, as conceptualized by Vroom (1995), involves three components.

#### ***Expectancy***

The first component of the theory is *expectancy*. Expectancy, expressed as  $E \rightarrow P$ , is one's belief that their effort will result in a desired level of performance (Van Eerde, 1976; Vroom, 1995). Its use in higher education has been less extensive than its use in business and manufacturing. However, its use in higher education has been primarily focused on predicting

student grade point average, student perceptions of faculty, or faculty behavior (Ernst, 2014; Malloch & Michael, 1981; Mitchell & Pollard, 1973). Within expectancy are multiple layers that play an important role in whether an individual believes they have the ability to expend the effort needed to reach the desired level of performance (Bandura, 1977). The first layer is the concept of self-efficacy, which is one's belief that they have the ability to perform a given task. This is not representative of their *actual* skill, but their own *perceived* ability. This important differentiation must be made to separate outside perceptions of the individual in order to recognize effects of the individual's psyche on work (Bandura, 1977). Bandura (1977) stated that, "people fear and tend to avoid threatening situations they believe exceed their coping skill, whereas they get involved in activities and behave assuredly when they judge themselves capable" (p. 194). Henson (1976), who suggested that a person's self-esteem will affect the expectancy-effort dynamic, further supported this idea.

### ***Instrumentality***

The second component of the theory is *instrumentality*. Instrumentality, expressed as  $P \rightarrow O$ , is one's belief that if they meet a desired performance standard, they will receive a reward or a positive outcome (Van Eerde, 1976; Vroom, 1995). Further development of instrumentality by Van Eerde (1976) included the idea of outcome expectations, where a "person's estimate that a given behavior will lead to a certain outcome" (p. 193). In a study on students' completing teacher evaluations, for example, Ernst (2014) identified instrumentality as the students' perception of completing the evaluation on potentially affecting future course instruction.

### ***Valence***

The third component of the theory is *valence*. Valence, expressed as  $V(R)$ , is the value an individual places on the reward they receive through their performance. "It is important to

distinguish between the valence of an outcome to a person and its value to that person” (Vroom, 1995, p. 18). This idea is exemplified by considering an employee who engages in a behavior that results in a monetary reward as opposed to engaging in a behavior based on avoidance of punishment or negative reinforcement.

### ***Theory Critics***

One of the major criticisms of the use of Vroom’s (1995) Expectancy Theory in research is the validity of self-reporting of participants in studies. Studies utilizing Vroom’s (1995) framework employ surveys and other measures that require subjects to self-report their behaviors (Henson, 1976; Robles & Roberson, 2014). Within the context of expectancy theory, Van Eerde (1976) conjectured that self-reports may be inflated. This noted criticism is important because of Expectancy Theory’s use of self-reported behaviors.

In the 1995 Jossey-Bass Classics reprinting of *Work and Motivation*, Vroom (1995) offered his own criticisms of his original 1964 Expectancy Theory model. The first self-criticism is that “individual decision makers must consider all alternatives and be capable of evaluating each on every relevant dimension” (Vroom, 1995, p. xviii). Vroom (1995) considered this inconsistent with how the brain processes information, and the “level of processing required by expectancy theory is rarely possible” (p. xix). Speaking on the formula for instrumentality, “I expressed the valence of an outcome, such as higher performance, as dependent on one’s belief about the consequences of the outcome for other outcomes and the valence of these other outcomes” (Vroom, 1995, p. xxi). Vroom (1995) originally considered the idea of differentiating means-ends processes regulated internally by the individual and “those that were mediated by external agents” (p. xxi). This criticism is important to this study and supports the development of the study’s position that providing course materials positively influences a student’s self-

efficacy and performance – even though the institution is acting as an external force. While not directly critical of his own theory, Vroom (1995) discussed the concept of motivation for effective performance:

“Those doing research on the performance implications of the model have used behavioral measures of effort. This research has been useful, but it is more appropriate to the world of physical labor than to knowledge work. Effort is normatively important among workers loading pig irons onto rail cars or oarsman working on a rowing team but it is less appropriate for computer programmers, marketing managers, or university presidents. The latter are exhorted to work ‘smarter, not harder.’ In this era of empowerment, people at all levels in the organization are urged to become leaders, to *find* a problem, not just solve those thrust at them, and to do the right thing rather than do things right” (p. xxii).

This study explicitly examined the obstacles faced by those who would be moving into positions Vroom (1995) suggested are less suited to be studied through his framework than those in positions utilizing physical labor, thus making the inference that the effort of college students’ ‘knowledge work’ is equal to that of the physical laborers as it relates to motivation and effort.

### ***Use of Theory***

The use of Vroom’s (1995) expectancy theory in this study revolved around the concepts of expectancy and instrumentality. As Vroom designed the theory, expectancy and instrumentality are action-performance and performance-outcome associations with assigned numerical values. As discussed later in this doctoral research study, providing students with their required course materials could positively influence student

expectancy, insofar as having their course materials on or before the first day of class may increase their self-efficacy or personal belief in being able to successfully pass a course.

### **Summary**

The current model of course materials acquisition contributes to rising textbook cost, which may negatively affect student in-class success and academic pursuits (Florida Virtual Campus, 2016; Textbooks Included, 2012; U.S. Government Accountability Office, 2013). Two emerging trends offer solutions to help ease the burden of course materials costs while ensuring that students do not have to wait to purchase their course materials.

Chapter 2 contains current scholarly and industry literature to further understand challenges faced in higher education as well as how the two emerging trends of open educational resources and first day of class access partnership between bookstore management firms, publishers, and campuses can affect the costs students pay for their required course materials.

## Chapter 2: Literature Review

There were many constructs to explore in attempting to understand how course materials impact student success. The first is the most prevalent model of course materials acquisition for college and university students. A student's ability, or inability, to obtain their course materials are one of the many barriers to success students face in the classroom. While exploring this barrier to in-class success, it was important to review how course materials costs and usage impact students' purchase and course enrollment decision-making. Recognizing the challenges and costs associated with course materials is central to understanding the implications of emerging models in higher education that attempt to reduce costs and put course materials in the hands of students on or before the first day of class.

A textbook industry study revealed that fewer than one-third of students secure all their required course materials on or before the first day of class (Textbooks Included, 2012). More importantly, 24% of students reported delaying the purchase of their required course materials until class had begun and 33% of students failed to secure their required course materials at all (OnCampus Research, 2012; Textbooks Included, 2012). Those trends are of concern considering that professors engage the required course materials in class, and course materials remain an important teaching and learning component (Buczynski, 2006; Hilton III, 2016; OnCampus Research, 2012; Textbooks Included, 2012).

The most prevalent model of acquisition for required course materials puts the onus directly on the student. Currently, in a majority of institutions, individual faculty members or department committees select the required course materials and submit the textbooks order to the campus bookstore. Most college campus bookstores attempt to source used copies of the required course materials from wholesalers or a limited number from students during buyback. Buyback

is the process in which students sell their textbooks back to the campus bookstore or other vendors (Blue Mountain Community College, 2019, Bodley 2016). During buyback, students can receive between 5% and 35% of the new book price. However, some campus bookstores offer up to 50% of the purchase price if there is an internal need for the next academic term (Buczynski, 2006; U.S. Government Accountability Office, 2005; 2013). If campus bookstores are unable to source enough used copies of the required course materials, they will purchase new copies directly from textbook publishers. Students must acquire their textbooks and other course materials from the local campus bookstore or from another source, such as online retailers or other students (Buczynski, 2006; U.S. Government Accountability Office, 2005; 2013). After the course has ended, the student may have the opportunity to sell their used textbooks to the bookstore. Understanding the course materials decision-making of students requires examination of research on barriers to student success, student engagement of their required course materials, the real costs of course materials, and what options are changing the course materials landscape.

### **Barriers to Success**

The success of students (e.g., student outcomes, retention, persistence) has been, and remains, a major issue in higher education (Crosling et al, 2009; Wood, 2014); so much so that state lawmakers have considered shifting state-funding models to focus on student outcomes and productivity rather than on enrollment (Arkansas State Act 148, 2017; Michalski, 2014; Watt & Long, 2015). While it is not the intention of this study to examine the multitude of barriers to success, it is important when discussing student outcomes to identify issues that can lead to poor performance, retention, and persistence (Clement, 2016; Lee & Choi, 2011; Scoggin & Styron, 2006).

Students face several challenges over the course of their educational journeys. Factors surrounding age, race, ethnicity, academic preparedness, first-generation student status, developmental courses, and grade point average play major roles in student outcomes, persistence, and retention (Bahr, 2012; Crisp & Nora, 2010; Feldman, 1993; Glenn, 2003; Mamiseishvili, 2011; Settle, 2011; Wood & Harris, 2015). Despite the research identifying barriers to success around student demographics, the most relevant predictor of student success/persistence may be grade point average (McGrath, 1997; Nakajima et al., 2012). This supports Fralick's (1993) finding that a student's low grade point average is the ultimate reason why students do not persist, regardless of other factors.

First-semester grade point average may be the best predictor as to whether a student graduates or not, and grade point average may be especially critical for underprepared students (Gershenfeld et al., 2016). To understand the importance of first-semester grade point average as it correlates to graduation for underrepresented students, Gershenfeld et al. (2016) found that underrepresented students who had a first semester grade point average below 2.33 (on a 4.0 scale) were at a much higher risk of failing to graduate than a reference group with a grade point average between 3.68 and 4.0. However, the study did not identify factors that contributed to low averages. An in-depth look at barriers might help understand how barriers lead to a student's low grade point average (David et al., 2015).

Understanding barriers that students in higher education face on campus is important to developing strategies to foster student success and retain students from semester to semester.

David et al. (2015) had students respond to the following barriers:

- 1) Poor College Adjustment
- 2) Lack of Social Support

- 3) Negative Experiences with College Services
- 4) Financial and Transportation Challenges
- 5) Technological Difficulties.

(David et al., 2015, p. 7)

“Students with lower GPAs were likely to report difficulties with college adjustment, college services, and financial and transportation issues” (David et al., 2015, p. 9). Of the negative experiences with college services barriers, students identified not knowing which textbooks to purchase as an issue (David et al., 2015). Those results, particularly the textbook barriers, could lead to students failing to purchase their course materials or engage them before class (Skinner & Howes, 2013).

### **Textbook Use and Student Performance**

Educators and researchers understand that, notwithstanding student perceptions, the textbook is an important aspect of the college classroom (Ryan, 2006). The textbook is an important link between classroom discussion, assignments, and discipline content (Berry et al., 2010; French et al., 2015; Ryan, 2006). However, “two-thirds of students are coming to class without reading the textbook, some of them, never buying the textbook at all” (Skinner & Howes, 2013, p. 133). A variety of studies examined how or why students are not engaging their course materials (Aagaard et al., 2014; Jolliffe & Harl, 2008; Landrum et al., 2012; Phillips & Phillips, 2007; Sappington et al., 2002).

Students surveyed reported that they did not engage their course materials on a regular basis. Clump et al. (2004) found that about 27% of 400 undergraduate students completed their reading assignments before class and 30% of students did not engage their textbook before taking an exam. Similarly, Sikorski et al (2002) reported that 60%-70% of students in an

introductory psychology course did not begin reading until 3 days prior to an exam. The results of Clump et al. (2004) mirrored the results of Burchfield & Sappington (2000) and French et al. (2015). The results of these studies only confound the question of how much students engage their course materials and how this affects their course performance.

### **Course Materials Pricing: Costs and Trends**

Textbook pricing is a combination of factors controlled by both publishers and bookstores (California State Auditor, 2008; Senack, 2014b; U.S. Government Accountability Office, 2005). “Publishers set the net [or list] price...based on development and production costs, expected sales, and competition from comparable products available in the market” (U.S. Government Accountability Office, 2005, p. 12). Higher education industry observers and participants agree that the cost of course materials has reached a tipping point (Baek & Monaghan, 2013; California State Auditor, 2008; Hilton III et al., 2013; Illowsky et al., 2016; Murphy & Shelley, 2020; National Association of College Stores, 2016a; 2016b; Senack, 2014a, United States Department of Education, 2015). In 2005, the U.S. Government Accountability Office reported that the cost of course materials had risen at double the rate of inflation from 1985 to 2005 – just ahead of the increase in tuition costs. Similarly, The Bureau of Labor Statistics (2016) found that between 2006 to 2016, textbooks increased by 88%, out pacing the increase in costs of college tuition and fees.

The actual dollars students spend on course materials is unclear, but estimates suggest the average student spends between \$1,000 and \$1,300 per academic year on their course materials (Achieving the Dream, 2016; Berry et al., 2010; Christie et al., 2009; College Board, 2017; National Association of College Stores, 2016b; Senack 2014b). “Students spent an average of \$602 on course materials during the year, compared with \$563 [during the 2014/15 academic

year], down considerably from the 2007/08 average of \$701” (National Association of College Stores, 2016b, p. 1). These findings are similar to a study conducted by the Florida Virtual Campus’ Office of Distance Learning and Student Services (2016), which reported that 17.9% of the over 22,000 student respondents spent more than \$500 per semester for their course materials.

While the total average dollars students pay for their course materials is down, this does not mean students are buying more textbooks because of the apparent reduction in cost. Students in the National Association of College Store’s 2016 survey actually purchased fewer course materials than they did in the prior year. In 2016, students purchased only an average of five items, down from 5.5 the year before (National Association of College Stores, 2016b). These results may indicate that the dollar amount spent by students was not decreasing because textbook prices were dropping, but students were forgoing the purchases of their required course materials.

A 2012 OnCampus study revealed that the most important factor when deciding to purchase a textbook was the price. More than one in three students decided not to purchase their required course materials even though they knew it could negatively affect their grade and course performance (Florida Virtual Campus, 2016; Salem, 2017, Senack, 2014a; Textbooks Included, 2012). The U.S. PIRG (Senack, 2014b) found that 65% of students opted out of purchasing the textbook because of the price.

It is more than just not purchasing course materials – pricing affects student academic decisions including whether or not to take a course or defer the course until they could afford the course material (Buczynski, 2007; Florida Virtual Campus, 2016; Senack, 2014a; Senack, 2014b; Sikorski et al., 2002; Textbooks Included, 2012). As the costs of course materials impact

student decision making, the higher education industry and interested third parties are seeking new ways to drive down the cost of course materials acquisition for students.

### **Course Materials Solutions**

There are a variety of stakeholders in the course materials landscape (Achieving the Dream, 2016; Advisory Committee on Student Financial Assistance, 2007; Anderson, 2015; Hilton III et al., 2013; IncludED, 2016; Lorgan, n.d). Some of the most notable and influential are the bookstore management firms, publishers, and grant funding organizations. Each one of these groups believes they have the solution to the increasing cost of course materials. There are a variety of industry solutions, as well as solutions being funded by foundations and organizations devoted to reducing the cost of course materials for students. The market has produced options beyond what most would consider the traditional textbook.

### ***Rental and Digital***

The last decade has brought multiple new course materials options. Current industry options include textbook rentals, digital textbooks, open educational resources, and the inclusion of course materials as part of tuition that provide students with access on or before the first day of class, an inclusive access model (Agnihotri et al., 2017; Baek & Monaghan, 2013; Carroll et al., 2016; Follett, 2016; Hilton III, 2016; IncludED, 2016; Lorgan, n.d.; National Association of College Stores, 2014; 2016b; Senack, 2014a; Straumsheim, 2016; Von Glahn, 2015). Campus bookstores have been renting textbooks for a number of years and students have saved over \$1 billion dollars by renting, as opposed to buying the textbooks in the last five years (Follett, 2016). In a 2014 industry survey by the National Association of College Stores, 40% of students reported renting at least one textbook during the Fall term – a 100% increase from just three years prior. Digital course materials have also had an impact on higher education. In general,

digital course textbooks can save students money, up to 50%, over purchasing physical copies (Baek & Monaghan, 2013; Buczynski, 2006; Straumsheim, 2016). The “use of digital materials [has] continued its slow and steady growth with 6 out of 10 students using at least one digital component during the Fall 2015 term, either digital textbook or an access code” (National Association of College Stores, 2016, p. 2).

### ***Emerging Models***

There are two emerging trends in higher education attempting to force shifts in the way students acquire their course materials. One trend is the use and support of open educational resources and another is the concept of providing students with their required course materials on or before the first day of class by including the cost of course materials into tuition or adding it as a course fee (Agnihotri et al., 2017; Follett 2015b; Hilton III, 2016; Hurley, 2020; IncludED, 2016). The latter model is referred to ‘inclusive access’ (McKenzie, 2017). Inclusive access has its roots in the partnership between bookstore firms, publishers, and campuses administrators. Campuses collaborate with their bookstore management firm and the publisher to roll the cost of the reduced, negotiated textbook price into tuition or add it as a course fee, which ensures that each student has their required course materials on or before the first day of class (Follett, 2015c; Hurley, 2020; IncludED, 2016; Lorgan, n.d.; Pace-Scrivener, 2014). This new course fee can be covered by a student’s financial aid (Anaya & Yankelewitz, 2020; United States Department of Education, 2009; 2012; 2015), reducing out-of-pocket expenses and potential student long-term debt (Cannon & Brick, 2015; Denison et al., 2014).

Both emerging models provide quicker and more convenient access to a student’s required course materials. However, there are two major differences in how these models account for the cost and creation of the content. Open educational resources are paid for through

grants and third-party funding while inclusive access material costs are passed on to students.

Open educational resources content is created by instructors, institutions, and third parties.

Inclusive access content is created by traditional textbook publishers. (Fischer et al., 2015; Hilton III et al., 2014; Krelja Kurelovic, 2016; Lorgan, n.d.; McKenzie, 2017; Pace-Scrivener, 2014).

### **Open Educational Resources (OER)**

The use of open educational resources is gaining traction in higher education. The William and Flora Hewlett Foundation (2016), one of the nation's first institutions to invest in open educational resources, defined open educational resources as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and repurposing by others". The main driver behind the use of open educational resources is the idea that students do not have to pay to access or use the material. Students have no financial responsibility in terms of payment for these resources because the rights have been negotiated for public consumption (Fischer et al., 2015; Hilton III et al., 2014).

### ***OER Student Cost Savings***

Achieving the Dream (2016), a national community college reform network, has partnered with 38 community colleges in 13 states to develop new degree programs exclusively using open educational resources. The new degree programs are "designed to help remove financial roadblocks that can derail student progress..." (Achieving the Dream, 2016, p. 1). Early results indicate that there could be success in terms of saving students money. Tidewater Community College's Achieving the Dream (2016) program has saved students an estimated 25% on tuition and textbooks.

Achieving the Dream (2016) results support earlier results of the Kaleidoscope Open Course Initiative (KOCI) as studied by Hilton III et al. (2014). The Kaleidoscope study revealed that by using open educational resources students potentially saved over \$300,000 compared to purchasing the required course materials. The research on open educational resources may indicate there is a potential cost savings for students, but there are costs associated with open educational resources.

### ***OER Administrative Costs***

The use of open educational resources deflects the direct costs of course materials off students. However, if students are not paying for course material access or to support the creation and curation of the content, someone else must pay for it. Rather than being free, the costs of the content are directed from one party to the next. The Achieving the Dream (2016) program has received over \$9 million from investors, and the Hewlett Foundation (2017) awarded \$19 million in grants to support the development of open educational resources in 2015. Not only are organizations like these awarding monies for the development of open educational resources, but special projects at institutions like California State University, the California Community College system, Temple University, the University of Massachusetts at Amherst, and Kansas State University are funding the creation, content curation, and support of open educational resources (Delimont et al., 2016). Within the discussion of open educational resources, there is little acknowledgement of the real costs associated with the use of these materials (Barnes, 2016; Mitchell et al., 2016).

The research literature on open educational resources rarely addresses these associated costs. However, in their 2014 report on the Kaleidoscope Open Course Initiative, Hilton III et al. (2014) acknowledged that there may be additional and unintended costs associated with the use

of open educational resources. “We acknowledge there are additional costs not accounted for, in that the original creation of many of the OER which were later used in KOCI was funded by grants from foundations or governments. Thus, some of the costs described in this article have been shifted from students to grant-issuing organizations” (Hilton III et al., 2014, p. 78). The authors contended that, while there are costs involved, those costs are “one-time costs, as opposed to the ongoing costs faced by students semester after semester...[and] these one-time development costs must be amortized across all uses by all students over all terms, both within and without KOCI” (Hilton III et al., 2014, p. 78).

### ***Student Outcomes OER***

The outcomes for students when open educational resources are used have been mixed (Bowen et al., 2012; Fischer et al., 2015; Hilton III & Laman, 2012; Hilton III et al., 2013). In one of the largest studies, the researchers found no significant difference in completion rate, passing a course with a letter grade ‘C’ or better grade, or final course grade between students who used open educational resources and students who used traditional course materials (Fischer et al., 2015). However, significant differences were found in what the researchers called ‘enrollment intensity’ between the two groups. “Even when controlling for differences in previous enrollment, students in courses using OER enrolled in a significantly higher number of credits in the next semester” (Fischer et al., 2015, p. 169). In a more recent study, Ryan (2019) found similar results. In courses that used OER, students withdrew from and finished the course more frequently, but not all courses using OER increased the percentage of students who passed a class with a letter grade ‘C’ or better. While the significance of open educational resources’ impact on student outcomes may be less clear, open educational resources may provide support

for ensuring students have access to their required course materials on or before the first day of class.

### **Inclusive Access (IA)**

Among bookstore management companies, publishers, and their campus partners, there is an emerging trend of providing students with their required course materials on or before the first day of class by including course materials costs into tuition or as a course fee, an inclusive access model (Agnihotri et al., 2017; Follett, 2015c; Hurley, 2020; IncludED, 2016; Lorgan, n.d.; McKenzie, 2017; Pace-Scrivener, 2014; Von Glahn, 2015). This process links content delivery to both an institution's learning management system and its student information system (Follett 2015b; 2015c; Murphy & Shelley, 2020; Pace-Scrivener, 2014). For the courses using this practice, students receive their textbooks via digital or physical delivery methods (Agnihotri et al., 2017; Feldstein et al., 2012; IncludED, 2016; Lorgan, n.d.). If the required course materials are delivered digitally, an email is sent to the student with their access code for the digital content, or the student can access the content directly from the institution's learning management system (Agnihotri et al., 2017; Follett, 2015c; Lorgan, n.d.). This process not only provides students with their required course materials earlier, but it is intended to drive down the acquisition costs for students (Follett 2015a; 2015b; 2015c; Hurley, 2020; Lorgan, n.d.; McKenzie, 2017; Murphy & Shelley, 2020; Pace-Scrivener, 2014).

### ***IA Student Cost Savings/Awareness***

The lack of research on inclusive access provides little support in identifying the potential savings for students as well as identifying the level of awareness that exists in higher education on the model. However, in their book published in 2020, Hurley compiled several institutional

studies that suggest student can potentially save \$55-\$200 with an inclusive access model compared to students who had the responsibility of sourcing their own required course materials.

Four studies cited in Hurley (2020) examined the impact of potential cost savings for students enrolled in courses that use an inclusive access course materials model. The Alamo Colleges District started their IM Direct program in 2015 with 286 course sections. Since 2015, the program has grown exponentially to 2,813 course sections – potentially saving students an estimated \$7 million (Anaya & Yankelewitz, 2020). Tarrant County College launched an inclusive access pilot in the Spring of 2018 with 23 course sections. Tarrant County College found that, compared to retail prices, students saved between \$60 and \$200, depending on the course. The average potential savings per student in the pilot program was \$90 and the total potential cost savings for the pilot program was \$56,000 (McClendon & McMillan, 2020). At a small public university in Texas, an inclusive access program was launched in 2010 with 100 courses serving 1250 students with an average course fee of \$64. By 2018, the cost of course materials in the inclusive access program only increased to \$71 while serving 11,639 students across 1,020 courses (Wakhungu & Yankelewitz, 2020). This 9% increase in the cost of the required course materials was significantly lower than the industry trend for course materials (Bureau of Labor Statistics, 2016). Chattanooga State Community College's inclusive access program saved students \$50 off the retail price of Pearson's MyLabsPlus. Since the Fall 2013 semester, CSCC has had over 30,000 students enrolled in courses using the inclusive access MyLabsPlus and has potentially saved students over \$2 million (Williams, Nichols, Cannon Fountain, Smith, Yankelewitz, & Fritson, 2020).

### ***Student Outcomes - IA***

No studies were found, outside of Hurley's (2020) book, *Inclusive Access and Open Educational Resources E-text Programs in Higher Education*, that addressed student outcomes using an inclusive access course materials model. In the book, three studies highlighted the potential of an inclusive access course materials model on student outcomes.

At a small public university in Texas, a study compared sections of the same course in the same term, in which some sections were using an inclusive access e-book while others were not using an inclusive access e-book, but rather a physical textbook. The study examined data from academic years 2016-2017, 2017-2018, and 2018-2019 and included 112 courses. For the total study population, students enrolled in the inclusive access e-book sections, there was a 4% increase in the percentage of students who earned a letter grade 'C' or better compared to the sections where students were not using an inclusive access e-book. Additionally, the variables of gender and race saw an increase in the percentage of students who passed a course with a letter grade 'C' or better when an inclusive access course materials model was being used in a course, compared to course sections not using an inclusive access program. The study did not clarify how many students were included in the 112 courses that were selected for analysis (Hurley & Fekrazad, 2020).

Students at a four-year university who used a Pearson MyLab product as part of an inclusive access program experienced a 4% increase in the number of students who received a letter grade 'A' and 11% increase in the number of students who received a letter grade "B" compared to student grade data before the inclusive access program was implemented (Wakhungu & Yankelewitz, 2020).

Finally, at a 2-year community college, an entire math department began an inclusive access program involving Pearson's MyLab product. The study examined a pre-inclusive access

period of Fall 2009 to Spring 2011 and post-inclusive access period of Fall 2013 to Fall 2018 that included over 37,000 students. When comparing before and after the implementation of an inclusive access program, students enrolled in courses using an inclusive access course materials model saw a 9.3% increase in the number of students who passed a letter grade 'C' or better. There was also an increase in the percentage of students who passed a course with a letter grade 'C' or better with respect to gender and race (Williams, Nichols, Cannon, Fountain, Smith, & Yankelewitz, 2020).

### **Student Outcomes – Access to Course Materials**

The Virginia State University Reginald F. Lewis School of Business collaborated with Flat World Knowledge to utilize open license textbooks that students could access from any device and download in a variety of formats for the Fall 2010 and Spring 2011 semesters. Feldstein et al. (2012) found that at the end of the Fall 2010 term, 80.2% of students using the provided course materials passed with a letter grade 'C' or better compared to 75.5% of students who did not have their course materials provided. At the end of the Spring 2011 term, 84.2% of students who used the provided course materials passed the class with a letter grade "C" or better compared to 77.5% for those who had to source their own required course materials. The researchers provided no data for course outcomes before the Flat World Knowledge text was used.

Another study was conducted by textbook publisher McGraw-Hill on their own software platform, Connect (Agnihotri et al., 2017). McGraw-Hill studied the access/purchase of their Connect product for 2.6 million students who made 3.2 million purchases in 2015. The researchers sought to understand the impact of the students' choice to delay access to their course materials on the students' course grades (Agnihotri et al., 2017).

That study revealed that students who delayed access to Connect fewer than 12 days performed better (74.4%) in their course than students who waited more than 12 days to access Connect (62.7%). Students who accessed Connect fewer than 3 days into the start of class performed better (76.7%) than those who waited more than 12 days into the start of class to access Connect (62.7%) (Agnihotri et al., 2017). The researchers had no access to institutional internal grade or demographic data, but they suggested that early access to course materials could improve student outcomes.

## **Conclusion**

To better understand students' decision-making relative to enrollment choices and what course materials to purchase, it is important to understand the course materials acquisition process from both a student's and institutional perspective, and costs associated with course materials (Florida Virtual Campus, 2016). A review of the scholarly and professional literature suggests that the cost of course materials has reached a critical point and that finding ways to drive down costs while promoting student outcomes is important. Current research has made strides in identifying interventions that colleges and universities can or should develop, implement, and monitor to support student success (Feldstein et al., 2012, McKenzie, 2017). The emerging practice of providing students with their required course materials on or before the first day of class by including the cost of the required course materials into tuition, as part of an inclusive access program, may reduce the financial burden for students. Notwithstanding the cost of course materials, sooner access or greater access to required course materials could affect a student's ability to pass a class with a letter grade 'C' or better (Agnihotri et al., 2017; Feldstein et al., 2012). The limited research (Hurley, 2020) on inclusive access course materials suggests there may be evidence that inclusive access programs can increase the percentage of students

who pass a class with a letter grade 'C' when compared to students who had the responsibility of sourcing their own required course materials.

## Chapter 3: Research Design

### Introduction

The purpose of this quantitative correlational research study was to examine the relationship between students who have their required textbooks and other course materials on or before the first day of class, as part of an inclusive access program, and student course outcomes. Selected student demographic variables allowed for targeted exploration of the impact of students having their required materials on or before the first day of class as part of an inclusive access program. This chapter outlines the methodology selected for this study, including research questions, hypotheses, research design, population sampling, data collection and analysis, validity, reliability, and protection of human subjects.

### Research Questions

The research conducted in this study examined the relationship between students having their required course materials provided to them on or before the first day of class, as part of an inclusive access program, and student course outcomes. The measure for student outcomes in this study include passing a class with a letter grade 'C' or better as well as mean numeric grades. The following research questions guided the study:

**RQ1:** To what extent do students pass a class with a letter grade 'C' or better when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials?

**RQ2:** To what extent do students pass a class with a letter grade 'C' or better when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials, when comparisons are made by gender and race?

**RQ3:** To what extent do students earn a grade of incomplete or withdraw from a course when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials?

**RQ4:** To what extent do students potentially save money when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students were responsible for sourcing their own required course materials?

### **Research Null/Alternative Hypotheses**

Null hypotheses along with their alternative hypotheses were developed to test the above research questions:

**H<sub>0</sub>1:** There is no statistically significant relationship between the number of students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>1:** There a statistically significant relationship between the number of students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>2:** There is no statistically significant relationship between the number of students who pass course BUSA 205 with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a2</sub>:** There is no statistically significant relationship between the number of students who pass course BUSA 205 with a letter grade 'C' or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>03</sub>:** There is no statistically significant relationship between the number of students who pass course CISC 101 with a letter grade 'C' or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a3</sub>:** There is a statistically significant relationship between the number of students who pass course CISC 101 with a letter grade 'C' or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>04</sub>:** There is no statistically significant relationship between the number of students who pass course PSYC 258 with a letter grade 'C' or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a4</sub>:** There is a statistically significant relationship between the number of students who pass course PSYC 258 with a letter grade 'C' or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>05</sub>:** There is no statistically significant relationship between the number of *female* students who pass a course with a letter grade 'C' or better as part of an inclusive access

program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>5:** There is a statistically significant relationship between the number of *female* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>6:** There is no statistically significant relationship between the number of *male* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>6:** There is a statistically significant relationship between the number of *male* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>7:** There is no statistically significant relationship between the number of *Black* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>7:** There is a statistically significant relationship between the number of *Black* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>8:** There is no statistically significant relationship between the number of *White* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>8:** There is a statistically significant relationship between the number of *White* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>9:** There is no statistically significant relationship between the number of *Hispanic* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>9:** There is a statistically significant relationship between the number of *Hispanic* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>10:** There is no statistically significant relationship between the number of *Other* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

**H<sub>a</sub>10:** There is a statistically significant relationship between the number of *Other* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access

program, compared to students who had the responsibility to source their own required course materials.

**H<sub>0</sub>11:** There is no statistically significant relationship between the number of students who earn a grade of incomplete or withdraw from a course as part of an inclusive access program, compared to students who had to responsibility to source their own required course materials.

**H<sub>a</sub>11:** There is a statistically significant relationship between the number of students who earn a grade of incomplete or withdraw from a course as part of an inclusive access program, compared to students who had to responsibility to source their own required course materials.

### **Research Design**

This study used a quantitative correlational research design to examine the relationship between students who have their required course materials on or before the first day of class, as part of an inclusive access program and student final course grades, compared to students who were responsible for sourcing their own required course materials. Quantitative research provides an opportunity to explore relationships and trends between variables (Creswell, 2014) while correlational research can provide statistical significance of the relationship of variables being examined (Aron et al., 2009; Gall et al., 2007; Pallant, 2016). “Correlational research designs...are highly useful in studying problems in education...” (Gall et al., 2007, p. 337). Correlational design allowed for analysis of how variables influence patterns of behavior (Gall et al., 2007). In using a correlational design, the results of this research study indicated a positive or negative relationship between students who received their course materials on or before the first day of class, as part of an inclusive access program, and student who had the responsibility to

source their own required course materials and may or may not have had them prior to the first day of class.

### **Research site**

This study was conducted at a community college in the Northeastern United States. The institution was chosen because they recently adopted the practice of providing students with their required course materials on or before the first day of class as part of an inclusive access program. The research site did not change the textbook being used before or after the inclusive access program was implemented. The courses used the same author, title, and publisher for the course materials except for moving from a physical to digital course material.

### **Population and Sampling**

Purposive sampling was used for this research study. A purposive sample is the deliberate selection of two populations that share similar qualities (Tongco, 2007). The sample size for this study included all students enrolled in three (3) courses the semester before an inclusive access program was implemented and all students enrolled in the same courses the year after the inclusive access program was implemented (Spring 2018/Spring 2019). This study used historical sample and population data that had already been collected by the institution and no experiment was conducted. Therefore, using similar or 'like' terms provided the most reliable conditions to examine the impact of an inclusive access program on student success.

### **Data Collection**

Pre-existing data stored at the research site in their student information system were used in this research study. Demographic variables used in this study had been collected by the institution from student admission applications, questionnaires, or other research site data collection methods while final course grades were entered by the specific course faculty member

or designee. The archived data provided student demographic information including age, gender, and race.

An email inquiry was sent to the community college's institutional research department as to their willingness to provide de-identified data regarding student final course outcomes for courses using the inclusive access model and corresponding courses where students had the responsibility to source their own required course materials. The email inquiry also gauged the institution's willingness to provide anonymous student demographic characteristics. All data pertaining to student final course outcomes, as well as demographic characteristics was kept in accordance with the research site's institutional review board guidelines for handling student information and the Northeastern University IRB.

### **Data Analysis**

Data analysis was conducted using the most current versions of Python and Excel. Data were reformatted to fit Python and Excel analysis with respect to final course grade and race. The institutionally provided data included nine race categories. Where students indicated their races. The three race categories with the highest totals were Black, Hispanic, and White. The remaining six races provided too small of a sample size to be counted individually therefore, those races were coded into their own category for the purpose of this study. When analyzing the data, the study utilized four race categories, White (WH), Black (BL), Hispanic (HI), and Other (OT). While the Other (OT) race category is a study-coded designation, the White, Black, and Hispanic coding is directly from the institutional data. As it pertains to final course grades, the institution provided letter grades ranging from letter 'A' through letter 'F' and designations of 'I' for students who received a grade of incomplete and 'W' for students who withdrew. For

statistical analysis, letter grades were converted into numeric grades using a standard range as follows:

**Table 1**  
**Numeric Grade Conversion**

A	97.5
A-	93.5
B+	90.5
B	87.5
B-	83.5
C+	80
C	76.5
C-	73.5
D+	70
D	66.5
D-	63.5
F	60.5
I/W	0

A chi-square test for independence was chosen because the research questions were posed to “explore the relationship between two categorical variables” (Pallant, 2016, p. 218). Similar studies have used a chi-square test of independence for exploring the relationship between course materials and student outcomes (Fischer et al., 2015). This study used a standard p-value of .05. Therefore, a chi-square test result of less than .05 provides evidence of a statistically significant relationship between the variables and rejects the null hypothesis (McLeod, 2019a; Rose 2014). Chi-square test analysis was conducted using a chi-square calculator located online at <https://www.socscistatistics.com/tests/chisquare2/default2.aspx>. T-test analysis was conducted using numeric grade means as calculated in Excel. All t-tests were executed using Excel’s *t-Test: Two-Sample Assuming Unequal Variances* data analysis function, and one-tailed t-test results were reported. One-tailed t-test reporting is appropriate when exploring the significance of a treatment in one direction (UCLA, n.d.).

## **Validity, Reliability, and Generalizability**

### ***Validity and Reliability***

Quantitative research is vulnerable to two types of validity threats: external validity and statistical conclusion validity (Creswell, 2014). External validity threats include instances when researchers “draw incorrect inferences from the sample data to other persons, other settings, and past or future situations” (Creswell, 2014, p. 176). Incorrect inferences can be caused by narrow characteristics of participants or research setting (Creswell, 2014). Statistical conclusion validity threats “arise when [researchers] draw inaccurate inferences from the data because of inadequate statistical power or violation of statistical assumptions” (Creswell, 2014, p. 176). To minimize such threats, this study avoided making claims of generalizability that do not pertain to populations outside of the research participants’ characteristics or conduct analysis on a new population with a new set of characteristics (Creswell, 2014).

Validity and reliability concerns for this study included incorrect data entry by the researcher or the research site. There is the possibility for human error during the entry of data collected by the institution regarding gender and race or during the coding of data by the researcher. There is also a possibility for human error during the data formatting and analysis by the researcher. The researcher used a second source to verify the accuracy of coding of research site data and data analysis.

### ***Generalizability***

Examining the relationship between two variables does not provide this study with the control measures to generalize findings across all community college student populations. “Correlation provides an indication that there is a relationship between two variables; it does not, however, indicate that one variable causes the other” (Pallant, 2016, p. 128). The results of this

research study can only be applied to the studied population. However, replicating the research design at similar community colleges engaged in an inclusive access model where students are provided with their required course materials on or before the first day of class, as could extend the positive or negative influence of the practice to a wider population.

### **Protection of Human Subjects**

This study used archival data and involved no threat to human subjects. The quantitative design of the study ensured there was no direct interaction between the researcher and the participants. The researcher ensured that data received from the research site was delivered anonymously and contained no identifying markers or numerical identifiers that could be used to single out any participant. The participating research site is addressed in generic form by stating it is a community college in a particular geographic region such as the northeast or southwest. Northeastern University Institutional Review Board granted approval this research study and the researcher followed all protocols as prescribed by the research site's Institutional Review Board in regard to handling and storing data.

### **Summary**

The research design and methodology used in this research study examined the relationship between providing community college students with their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. Examining student characteristics of gender and race provided further exploration of the relationship between student access to course materials and student outcomes and the effects of the inclusive access on particular groups of students. The data used for this study were from a community college in the Northeastern United States. Multiple 2x2 chi-square tests and independent t-tests were performed

to address the three (3) of the four (4) research questions and test the eleven (11) research null hypotheses.

## **Chapter 4: Findings and Analysis**

The purpose of this quantitative, correlational study was to examine the impact on student outcomes when community college students are provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. The study sought to provide evidence as to whether or not an inclusive access program increases in the percentage of students who pass a course with a letter grade ‘C’ or better. To accomplish this purpose, this study examined three (3) courses, first before inclusive access was implemented and then once inclusive access was implemented the next year during the same term (Fall or Spring terms).

Chapter 4 serves to provide demographic information on the study population, answers the central and secondary research questions, provide statistical analysis of the null hypotheses of this research study, and present any unexpected findings. This study utilized a chi-square test of independence to address each null hypothesis and used a standard p-value of .05. Therefore, a chi-square test result of less than .05 provides evidence of a statistically significant relationship between the variables and rejects the null hypothesis (McLeod, 2019a; Rose 2014).

### **Demographic Data**

To determine whether an inclusive access course materials model had impact on student success, this study compares student outcomes in courses that used the traditional course materials model versus courses that used an inclusive access model. As noted in Table 1, the control (“NoIA”) references data from a course that did not use the inclusive access model, and the treatment (“IA”) references data from a course that did use the inclusive access model and was taught the following ‘like’ term the next academic year. The data analyzed in this study were collected by the institution as part of its normal operations.

**Table 2**  
**Study Population**

<b>Course</b>	<b>IA Status</b>	<b>Term</b>	<b>Population</b>	<b>Textbook</b>
<b>BUSA 205 - Management</b>	NoIA	Spring 2018	<i>N</i> =239	Digital
	IA	Spring 2019	<i>N</i> =224	Digital
<b>CISC 101 - Intro to Computers</b>	NoIA	Fall 2018	<i>N</i> =694	Physical
	IA	Fall 2019	<i>N</i> =704	Digital
<b>PSYC 258 - Psychology</b>	NoIA	Fall 2018	<i>N</i> =350	Physical
	IA	Fall 2019	<i>N</i> =339	Digital

The total study population was 2,550 students (*N*=2550). Included in the total population sample were 1,522 females and 1,028 males. The sample included 370 Black students, 653 Hispanic students, 1,306 White students, and 221 students whose race was designated as Other. Of the 2,550 students in the total study sample population, the mean age was 25.

CISC 101 and PSYC 258 utilized a physical textbook with an access code in the semester before the inclusive access model was implemented and utilized a digital access code (same author, title, and publisher) delivered through the learning management system for the semester using the inclusive access model. BUSA 205 utilized an access code before the inclusive access model was implemented and remained with the same access code (same author, title, and publisher) after the inclusive access model was implemented.

### **Research Question 1: Letter Grade C or Better**

The first research question explored to what extent students pass with a letter grade ‘C’ or better when their required course materials are provided, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials. The research question is answered in two parts: by total population and by course.

### ***Grade Distribution***

The total study population, between all three courses and six semesters, was 2,550 (*N*=2550). Table 3.1 presents the non-normalized grade distribution while Table 3.2 presents the

normalized grade distribution and percent difference between the NoIA control and IA treatment. In these and subsequent tables, *NoIA* (“No Inclusive Access”) represents the course sections before the inclusive access program was implemented and *IA* (“Inclusive Access”) represents the course sections during which the inclusive access program was implemented. A total of 1,284 students were enrolled in course sections not using an inclusive access program while 1,266 were enrolled in course sections that were using an inclusive access program.

**Table 3.1**  
**Grade Distribution**

Nominal			
Grade	NoIA	IA	Difference
A	471	509	38
B	256	253	-3
C	172	164	-8
D	91	75	-16
F	85	76	-9
I/W	209	189	-20
<b>Total</b>	1284	1266	

**Table 3.2**  
**Grade Distribution**

Percentages				
Grade	NoIA	IA	Difference	% Diff
A	36.68	40.21	3.52	9.60%
B	19.94	19.98	0.05	0.23%
C	13.40	12.95	-0.44	-3.30%
D	7.09	5.92	-1.16	-16.41%
F	6.62	6.00	-0.62	-9.32%
I/W	16.28	14.93	-1.35	-8.28%
<b>Total</b>	100.00	100.00		

Grade distribution analysis revealed that there was a 9.6 increase in the percent difference in students who earned a letter grade ‘A’ when receiving their required course materials, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. Furthermore, there was a decrease in the percent difference of students who earned a letter grade of ‘D’ (-16.41%), ‘F’ (-9.32%), and students who withdrew or received an incomplete grade (-8.28%).

### ***Total Population ‘C’ or Better***

Table 4.1 presents nominal data distribution of whether or not a student was in a course using an inclusive access program and if the student earned a letter grade ‘C’ or better. Table 4.2 presents the percentages distribution of letter grade ‘C’ or better before the implementation of an

inclusive access program and after the implementation of an inclusive access program and the percent difference between the NoIA control and IA treatment.

**Table 4.1**  
**Total Population**

Nominal			
C>	NoIA	IA	Difference
No	215	182	-33
Yes	860	895	35
<b>Total</b>	1075	1077	

**Table 4.2**  
**Total Population**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	20.00	16.90	-3.10	-15.51%
Yes	80.00	83.10	3.10	3.88%
<b>Total</b>	100.00	100.00		

A total of 2,152 students ( $N=2152$ ) earned a letter grade between 'A' and 'F'; 398 students within the total population ( $N=2550$ ) earned a grade of incomplete or withdrew from the course. Students who earned a grade of incomplete or withdrew from a course are not included in the letter grade 'C' or better calculations because they did not complete the course. There was an overall increase (+3.88) in the percent difference of students who passed a course with a letter grade 'C' or better when provided their required course materials as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials.

#### ***By Course "C" or Better***

There were 463 students enrolled in BUSA 205, 1,398 students enrolled in CISC 101, and 689 students enrolled in PSYC 258. Tables 5.1, 6.1, and 7.1 present, by course, the nominal distribution of letter grade 'C' or better before the implementation of an inclusive access program and after the implementation of an inclusive access program. Tables 5.2, 6.2, and 7.2 present, by course, the percentage distribution of letter grade 'C' or better before the implementation of an inclusive access program and after the implementation of an inclusive access program and the percent difference between the NoIA control and IA treatment.

**Table 5.1**  
**BUSA 205**

Nominal			
C>	NoIA	IA	Difference
No	58	39	-19
Yes	139	149	10
<b>Total</b>	197	188	

**Table 5.2**  
**BUSA 205**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	29.44	20.74	-8.70	-29.54%
Yes	70.56	79.26	8.70	12.33%
<b>Total</b>	100.00	100.00		

**Table 6.1**  
**CISC 101**

Nominal			
C>	NoIA	IA	Difference
No	121	116	-5
Yes	438	452	14
<b>Total</b>	559	568	

**Table 6.2**  
**CISC 101**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	21.65	20.42	-1.22	-5.65%
Yes	78.35	79.58	1.22	1.56%
<b>Total</b>	100.00	100.00		

**Table 7.1**  
**PSYC 258**

Nominal			
C>	NoIA	IA	Difference
No	36	27	-9
Yes	283	294	11
<b>Total</b>	319	321	

**Table 7.2**  
**PSYC 258**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	11.29	8.41	-2.87	-25.47%
Yes	88.71	91.59	2.87	3.24%
<b>Total</b>	100.00	100.00		

Students enrolled in BUSA 205 (+12.33), CISC 101 (+1.56), and PSYC 258 (+3.24) using an inclusive access model had an increase in the percent difference of students who passed the course with a letter grade 'C' or better compared to students enrolled in courses where they had the responsibility of sourcing their own required course materials.

### ***Null Hypothesis $H_01$***

The null hypothesis (**H<sub>01</sub>**) stated there is no statistically significant relationship between the number of students who pass a course with a letter grade 'C' or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically

significant relationship exists. The chi-square test result for null hypothesis **H<sub>01</sub>** ( $\chi^2 (1, N = 2152) = 3.44 p > .05$ ) produced a p-value of .064 which is more than the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between students enrolled in courses using an inclusive access model (IA) and students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA student numeric grades and  $\mu_2$  is mean of NoIA student numeric grades. There is not a significant difference in the scores for IA students ( $M=86.71, SD=11.95$ ) and NoIA students ( $M=85.87, SD=11.59$ ) conditions;  $t(2149)=1.62, p=.053$ . There is a small effect size of .070.

### ***Null Hypothesis H<sub>02</sub>***

The null hypothesis (**H<sub>02</sub>**) stated there is no statistically significant relationship between the number of students who pass course *BUSA 205* with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>02</sub>** ( $\chi^2 (1, N = 385) = 3.86 p < .05$ ) produced a p-value of .049 which is less than the required .05.

Therefore, the null hypothesis is rejected.

To further test the relationship between students enrolled in course *BUSA 205* using an inclusive access model (IA) and students enrolled in course *BUSA 205* who had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *BUSA 205* student numeric grades and  $\mu_2$  is mean of NoIA *BUSA 205* student numeric grades. There is not

a significant difference in the scores for IA students ( $M=82.02$ ,  $SD=10.62$ ) and NoIA students ( $M=81.42$ ,  $SD=10.82$ ) conditions;  $t(383)=.56$ ,  $p=.289$ . There is a small effect size of .057

### ***Null Hypothesis H<sub>03</sub>***

The null hypothesis (**H<sub>03</sub>**) stated there is no statistically significant relationship between the number of students who pass course *CISC 101* with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>03</sub>** ( $\chi^2(1, N = 1127) = .25$   $p>.05$ ) produced a p-value of .614 which is more than the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between students enrolled in course *CISC 101* using an inclusive access model (IA) and students enrolled in course *CISC 101* who had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *CISC 101* student numeric grades and  $\mu_2$  is mean of NoIA *CISC 101* student numeric grades. There is not a significant difference in the scores for IA students ( $M=86.27$ ,  $SD=12.79$ ) and NoIA students ( $M=85.60$ ,  $SD=12.93$ ) conditions;  $t(1124)=.871$ ,  $p=.192$ . There is a small effect size of .052.

### ***Null Hypothesis H<sub>04</sub>***

The null hypothesis (**H<sub>04</sub>**) states there is no statistically significant relationship between the number of students who passed course *PSYC 258* with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>04</sub>**

( $\chi^2(1, N = 640) = 1.49, p > .05$ ) produced a p-value of .222 which is more than the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between students enrolled in course PSYC 258 using an inclusive access model (IA) and students enrolled in course PSYC 258 who had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA PSYC 258 student numeric grades and  $\mu_2$  is mean of NoIA PSYC 258 student numeric grades. There was not a significant difference in the scores for IA students ( $M=90.62, SD=9.79$ ) and NoIA students ( $M=89.50, SD=10.69$ ) conditions;  $t(632)=1.38, p=.083$ . There was a small effect size of .109.

### **Research Question 2: Gender and Race**

The second research question explored to what extent, with respect to gender and race, do students pass a course with a letter grade ‘C’ or better when their required course materials were provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials. To answer this research question, this study examined the research data by gender and race.

#### ***Gender***

A total of 682 females and 395 males were enrolled in course sections that were using an inclusive access program while 647 females and 428 males were enrolled in course sections not using an inclusive access program. Table 8.1 presents a nominal distribution of students by gender, whether or not their course was using an inclusive access program, and if the student earned a letter grade ‘C’ or better, while Table 8.2 presents the percentage data and the percent difference between the NoIA control and IA treatment.

**Table 8.1**  
**Gender**

	Nominal					
	Female			Male		
C >	NoIA	IA	Difference	NoIA	IA	Difference
No	113	97	-16	102	85	-17
Yes	534	585	51	326	310	-16
Total	647	682		428	395	

**Table 8.2**  
**Gender**

	Percentages							
	Female				Male			
C >	NoIA	IA	Difference	% Diff	NoIA	IA	Difference	% Diff
No	17.47	14.22	-3.24	-18.56%	23.83	21.52	-2.31	-9.70%
Yes	82.53	85.78	3.24	3.93%	76.17	78.48	2.31	3.04%
Total	100	100			100	100		

With respect to gender, both male (+3.04) and female (+3.93) students experienced an increase in the percentage of students who passed a course with a letter grade ‘C’ or better in courses using an inclusive access model compared to students enrolled in courses where they had the responsibility of sourcing their own required course materials.

### ***Race***

The institutionally provided data included nine race categories. The three race categories with the highest totals were Black ( $N=273$ ), Hispanic ( $N=548$ ), and White ( $N=1143$ ). The remaining six race categories provided too small of a sample size to be counted individually therefore, those races were coded into their own category for the purpose of this study. When analyzing the data, the study utilized four race categories, White (WH), Black (BL), Hispanic (HI), and Other (OT). While the Other (OT) race category ( $N=188$ ) is a study-coded designation, the White, Black, and Hispanic coding is directly from the institutional data. Tables 9.1, 10.1, 11.1, and 12.1 present, by race, the nominal distribution of letter grade ‘C’ or better before the

implementation of an inclusive access program and after the implementation of an inclusive access program. Tables 9.2, 10.2, 11.2, and 12.2 present, by race, the percentages distribution of letter grade 'C' or better before the implementation of an inclusive access program and after the implementation of an inclusive access program and the percent difference between the NoIA control and IA treatment.

**Table 9.1**  
**Black Students**

Nominal			
C>	NoIA	IA	Difference
No	52	28	-24
Yes	95	98	3
<b>Total</b>	<b>147</b>	<b>126</b>	

**Table 9.2**  
**Black Students**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	35.37	22.22	-13.15	-37.18%
Yes	64.63	77.78	13.15	20.35%
<b>Total</b>	<b>100.00</b>	<b>100.00</b>		

**Table 10.1**  
**White Students**

Nominal			
C>	NoIA	IA	Difference
No	84	76	-8
Yes	486	497	11
<b>Total</b>	<b>570</b>	<b>573</b>	

**Table 10.2**  
**White Students**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	14.74	13.26	-1.47	-10.00%
Yes	85.26	86.74	1.47	1.73%
<b>Total</b>	<b>100.00</b>	<b>100.00</b>		

**Table 11.1**  
**Hispanic Students**

Nominal			
C>	NoIA	IA	Difference
No	65	64	-1
Yes	204	215	11
<b>Total</b>	<b>269</b>	<b>279</b>	

**Table 11.2**  
**Hispanic Students**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	24.16	22.94	-1.22	-5.07%
Yes	75.84	77.06	1.22	1.61%
<b>Total</b>	<b>100.00</b>	<b>100.00</b>		

**Table 12.1**  
**Other Students**

Nominal			
C>	NoIA	IA	Difference
No	14	14	0
Yes	75	85	10
<b>Total</b>	<b>89</b>	<b>99</b>	

**Table 12.2**  
**Other Students**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	15.73	14.14	-1.59	-10.10%
Yes	84.27	85.86	1.59	1.89%
<b>Total</b>	<b>100.00</b>	<b>100.00</b>		

All races saw an increase in the percent difference of students who pass a course with a letter grade ‘C’ or better when provided their required course materials, as part of an inclusive access program, when compared to students enrolled in courses where they had the responsibility of sourcing their own required course materials. Black students had the highest percent difference increase (+20.35) while Hispanic students had the lowest percent difference increase (+1.73).

### ***Hypothesis H<sub>05</sub>***

The null hypothesis (**H<sub>05</sub>**) stated there is no statistically significant relationship between the number of *female* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>05</sub>** ( $\chi^2(1, N=1329) = 2.62, p > .05$ ) produced a p-value of .105 which is over the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between *female* students enrolled in courses using an inclusive access model (IA) and *female* students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *female* student numeric grades and  $\mu_2$  is mean of NoIA *female* student numeric grades. There is not a significant difference in the scores for IA students (M=88.22, SD=11.63) and NoIA students (M=87.21, SD=12.04) conditions;  $t(1317)=1.55, p=.060$ . There is a small effect size of .085.

### ***Hypothesis H<sub>06</sub>***

The null hypothesis (**H<sub>06</sub>**) stated there is no statistically significant relationship between the number of *male* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>06</sub>** ( $\chi^2(1, N=823) = 0.63, p > .05$ ) produced a p-value of .429 which is over the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between *male* students enrolled in courses using an inclusive access model (IA) and *male* students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *male* student numeric grades and  $\mu_2$  is mean of NoIA *male* student numeric grades. There is not a significant difference in the numeric grade scores for IA students ( $M=84.65, SD=12.26$ ) and NoIA students ( $M=84.28, SD=12.40$ ) conditions;  $t(817)=.42, p=.336$ . There is a small effect size of .030.

### ***Hypothesis H<sub>07</sub>***

The null hypothesis (**H<sub>07</sub>**) stated there is no statistically significant relationship between the number of *Black* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>07</sub>** ( $\chi^2(1, N = 273) = 5.67 p < .05$ ) produced a p-value of .017 which is less than the required .05. Therefore, the null hypothesis is rejected

To further test the relationship between *Black* (race) students enrolled in courses using an inclusive access model (IA) and *Black* (race) students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *Black* (race) student numeric grades and  $\mu_2$  is mean of NoIA *Black* (race) student numeric grades. There is a significant difference in the scores for IA students (M=84.10, SD=12.23) and NoIA students (M=80.69, SD=13.34) conditions;  $t(270)=2.20, p=.014$ . There is a small effect size of .266.

### ***Hypothesis H08***

The null hypothesis (**H08**) stated there is no statistically significant relationship between the number of *White* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H08** ( $\chi^2(1, N = 1143) = .51, p > .05$ ) produced a p-value of .473 which is over the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between *White* (race) students enrolled in courses using an inclusive access model (IA) and *White* (race) students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *White* (race) student numeric grades and  $\mu_2$  is mean of NoIA *White* (race) student numeric grades. There is a significant difference in the scores for IA students (M=88.62, SD=11.28) and no IA (M=87.82, SD=11.27) conditions;  $t(1141)=1.20, p=.116$ . There is a small effect size of .067.

### ***Hypothesis H<sub>09</sub>***

The null hypothesis (**H<sub>09</sub>**) stated there is no statistically significant relationship between the number of *Hispanic* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>09</sub>** ( $\chi^2 (1, N = 548) = .11, p > .05$ ) produced a p-value of .736 which is over the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between *Hispanic* (race) students enrolled in courses using an inclusive access model (IA) and *Hispanic* (race) students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *Hispanic* (race) student numeric grades and  $\mu_2$  is mean of NoIA *Hispanic* (race) student numeric grades. There is a significant difference in the scores for IA students (M=84.28, SD=12.71) and NoIA students (M=84.39, SD=12.77) conditions;  $t(545) = .10, p = .460$ . There is a small effect size of .009.

### ***Hypothesis H<sub>010</sub>***

The null hypothesis (**H<sub>010</sub>**) stated there is no statistically significant relationship between the number of *Other* (race) students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>010</sub>**

( $\chi^2(1, N = 188) = .09, p > .05$ ) produced a p-value of .760 which is over the required .05.

Therefore, the null hypothesis cannot be rejected.

To further test the relationship between *Other* (race) students enrolled in courses using an inclusive access model (IA) and *Other* (race) students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA *Other* (race) student numeric grades and  $\mu_2$  is mean of NoIA *Other* (race) student numeric grades.

There is not a significant difference in the scores for IA students ( $M=87.09, SD=11.34$ ) and no IA ( $M=87.86, SD=11.59$ ) conditions;  $t(183)=-.46, p=.322$ . There is a small effect size of .067.

### **Research Question 3: Incomplete/Withdrawal**

The third research question explored to what extent students earn a grade of incomplete or withdraw from a course when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students who were responsible for sourcing their own required course materials. To answer this research question, this study examined the research data with regard to reported grades of *incomplete* and *withdraw*.

Table 13.1 presents the nominal distribution of incomplete/withdrawal distribution before the implementation of an inclusive access program and after the implementation of an inclusive access program. Table 13.2 presents the percentages distribution of incomplete/withdrawal distribution before the implementation of an inclusive access program and after the implementation of an inclusive access program and the percent difference between the NoIA control and IA treatment.

**Table 13.1**  
**Incomplete/Withdrawal**  
**Nominal**

	Incomplete/Withdrawal		
I/W	NoIA	IA	Difference
Yes	209	189	-20
No	1075	1077	2
Total	1284	1266	

**Table 13.2**  
**Incomplete/Withdrawal**  
**Percentages**

	Incomplete/Withdrawal			
I/W	NoIA	IA	Difference	% Difference
Yes	16.28	14.93	-1.35	-8.28%
No	83.72	85.07	1.35	1.61%
Total	100	100		

In courses using an inclusive access program, there was an -8.28 decrease in the percent difference of student withdrawals and incomplete grades. This demonstrates fewer students were withdrawing from a course or receiving an incomplete grade while enrolled in courses using an inclusive access program.

### ***Hypothesis H<sub>011</sub>***

The null hypothesis (**H<sub>011</sub>**) states there is no statistically significant relationship between the number of students who earn a grade of incomplete or withdraw from a course as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials.

A chi-square test of independence was performed to examine if there is a statistically significant difference between the number of course withdrawals/incomplete grades when having their required course materials provided on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own course required materials. The chi-square test result for null hypothesis **H<sub>011</sub>** ( $\chi^2(1, N = 398) = 0.88, p > .05$ ) produced a p-value of .348 which is over the required .05. Therefore, the null hypothesis cannot be rejected.

### **Research Question 4: Cost Savings**

The fourth research question explored to what extent do students save money when their required course materials are provided on or before the first day of class, as part of an inclusive access program, compared to students were responsible for sourcing their own required course materials?

To answer the fourth research question, the study examined cost data between the term before the inclusive access model was implemented and the term the inclusive access model was implemented. Tables 14.1, 14.2, 14.3 present the course, term, enrollment, course materials potential cost for the course, total potential cost for students enrolled in the course, and cost savings for students enrolled in the courses using the inclusive access model.

**Table 14.1**  
**Savings - BUSA 205**

Course	Term	Enrollment	Potential Cost	Total Potential Cost
BUSA 205	Spring 2018	239	\$159.00	\$38,001.00
	Spring 2019	224	\$86.75	\$19,432.00
Student Savings			-\$72.25	-\$18,569.00

**Table 14.2**  
**Savings - CISC 101**

Course	Term	Enrollment	Potential Cost	Total Potential Cost
CISC 101	Fall 2018	694	\$127.96	\$88,804.24
	Fall 2019	704	\$96.00	\$67,584.00
Student Savings			-\$31.96	-\$21,220.24

**Table 14.3**  
**Savings - PSYC 258**

Course	Term	Enrollment	Potential Cost	Total Potential Cost
PSYC 258	Fall 2018	350	\$104.00	\$36,400.00
	Fall 2019	339	\$42.75	\$14,492.25
Student Savings			-\$61.25	-\$21,907.75

In BUSA 205, students who had the responsibility of sourcing their own required course materials potentially paid \$159.00 for their course materials if the student sourced them from the

campus bookstore. Students enrolled in BUSA 205 where the inclusive access program was used paid \$86.75. The resulting difference of \$72.25 potentially saved students enrolled in BUSA 205 using an inclusive access program \$18,569.00

In CISC 101, students who had the responsibility of sourcing their own required course materials potentially paid \$127.96 for their course materials if the student sourced them from the campus bookstore. Students enrolled in CISC 101 where the inclusive access program was used paid \$96.00. The resulting difference of \$31.96 potentially saved students enrolled in CISC 101 using an inclusive access program \$21,220.24.

In PSYC 258, students who had the responsibility of sourcing their own required course materials potentially paid \$104.00 for their course materials if the student sourced them from the campus bookstore. Students enrolled in PSYC 258 where the inclusive access program was used paid \$42.75. The resulting difference of \$61.25 potentially saved students enrolled in PSYC 258 using an inclusive access program \$21,907.75. Overall, the 1,267 students enrolled in courses using an inclusive access model potentially saved a total of \$61,696.99.

### **Unexpected Findings**

The mean age of the study population was 25 years old. This age range is in line with the definition of non-traditional students (Chen, 2017; Ellis, 2019; Fortin et al., 2016). This connection required further exploration and a chi-square test of independence and t-test were performed to examine if there was a statistically significant relationship, with respect to age, between the number of students who passed a course with a letter grade 'C' or better when provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course material.

The specific implications of this unexpected finding are addressed in Chapter 5. Tables 9a and 10a present, by age, the non-normalized distribution of letter grade ‘C’ or better before the implementation of an inclusive access program and after the implementation of an inclusive access program. Tables 15.1 and 16.1 present, by age, the nominal distribution of letter grade ‘C’ or better before the implementation of an inclusive access program and after the implementation of an inclusive access program. Tables 15.2 and 16.2 presents, by age, the percentages distribution of letter grade ‘C’ or better before the implementation of an inclusive access program and after the implementation of an inclusive access program and the percent difference between the NoIA control and IA treatment.

**Table 15.1**  
**Students  $\leq$  Age 24**

Nominal			
C>	NoIA	IA	Difference
No	166	149	-17
Yes	576	585	9
<b>Total</b>	<b>742</b>	<b>734</b>	

**Table 15.2**  
**Students  $\leq$  Age 24**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	22.37	20.30	-2.07	-9.26%
Yes	77.63	79.70	2.07	2.67%
<b>Total</b>	<b>100.00</b>	<b>100.00</b>		

**Table 16.1**  
**Students  $\geq$  Age 25**

Nominal			
C>	NoIA	IA	Difference
No	49	33	-16
Yes	280	300	20
<b>Total</b>	<b>329</b>	<b>333</b>	

**Table 16.2**  
**Students  $\geq$  Age 25**

Percentages				
C>	NoIA	IA	Difference	% Difference
No	14.89	9.91	-4.98	-33.46%
Yes	85.11	90.09	4.98	5.86%
<b>Total</b>	<b>100.00</b>	<b>100.00</b>		

Students 24 years old and under (+2.67) and students 25 years of age or older (+5.86) had an increase in the percent difference of students who passed a course with a letter grade ‘C’ or better in courses using an inclusive access program. As an unexpected finding, null hypotheses (**H<sub>012</sub>** and **H<sub>013</sub>**) were developed outside of the intended framework of the study.

### ***Hypothesis H<sub>012</sub>***

The null hypothesis (**H<sub>0</sub>12**) stated there is no statistically significant relationship between the number of  $\leq$  *Age 24* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>0</sub>12** ( $\chi^2(1, N = 1476) = .94, p > .05$ ) produced a p-value of .331 which is over the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between  $\leq$  *Age 24* students enrolled in courses using an inclusive access model (IA) and  $\leq$  *Age 24* students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA  $\leq$  *Age 24* student numeric grades and  $\mu_2$  is mean of NoIA  $\leq$  *Age 24* student numeric grades. There is not a significant difference in the scores for IA students ( $M=85.30, SD=12.30$ ) and NoIA students ( $M=84.85, SD=12.34$ ) conditions;  $t(1474)=.69, p=.244$ . There is a small effect size of .036.

### ***Hypothesis H<sub>0</sub>13***

The null hypothesis (**H<sub>0</sub>13**) stated there is no statistically significant relationship between the number of  $\geq$  *Age 25* students who pass a course with a letter grade ‘C’ or better as part of an inclusive access program, compared to students who had the responsibility to source their own required course materials. A chi-square test of independence was performed to examine if any statistically significant relationship exists. The chi-square test result for null hypothesis **H<sub>0</sub>13** ( $\chi^2(1, N = 662) = 3.79, p > .05$ ) produced a p-value of .051, which is more than the required .05. Therefore, the null hypothesis cannot be rejected.

To further test the relationship between  $\geq$  Age 25 students enrolled in courses using an inclusive access model (IA) and  $\geq$  Age 25 students enrolled in courses which they had to source their own course materials (NoIA) a t-test was conducted on numeric grades as identified in Chapter 3. The null hypothesis tested here was  $H_0: \mu_1 = \mu_2$  where  $\mu_1$  is the mean of IA  $\geq$  Age 25 student numeric grades and  $\mu_2$  is mean of NoIA  $\geq$  Age 25 student numeric grades. There is a significant difference in the scores for IA students (M=89.95, SD=10.54) and NoIA students (M=88.47, SD=11.67) conditions;  $t(652)=1.71$ ,  $p=.044$ .. There is a small effect size of .133.

### **Summary**

The purpose of this quantitative, correlational study was to examine the impact of student outcomes when community college students are provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials.

In answering the four research questions, it was found that there was an increase in the percent difference of students who earned a letter grade 'A' (+9.60) and a decrease in the percent difference of students who achieved a letter grade 'C' (-3.30), 'D' (-16.41), and 'F' (-9.32). Both male (+3.04) and female (+3.93) students had an increase in the percent difference of students who passed a course with a letter grade 'C' or better. Within the overall population, there was a +5.55 increase in the percent difference of students who achieved a letter grade 'C' or better. In each course (BUSA 205 +12.33, CISC 101 +1.56, PSYC 258 +3.24) using an inclusive access model experienced an increase in the percent difference of students who passed a class with a letter grade 'C' or better. With respect to race, all races saw an increase in the percent difference of students who passed a course with a letter grade 'C' or better. It was also found that there was a decrease (-8.28) in the percent difference of students who withdrew or received an incomplete

grade when enrolled in courses using an inclusive access program. In an unexpected finding, there was an increase in the percent difference of students 25 years of age and older (+5.86) who passed a course with a letter grade 'C' or better when enrolled in a course using an inclusive access program. This demographic was important because this is the age demarcation for non-traditional students (Chen, 2017; Ellis, 2019; Fortin et al., 2016). Analysis of the potential costs for students who had the responsibility of sourcing their own required course materials and students who were enrolled in courses using an inclusive access course materials model revealed a potential savings of \$61,696.99 for those students enrolled in courses using an inclusive access model.

Data analysis, through chi-square tests of independence, was performed to find if evidence of statistically significant relationships exists between the number of students who passed a course with a letter grade 'C' or better when provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. Concurrently with each chi-square test of independence, t-tests were conducted to further test the relationship between student populations enrolled in courses using an inclusive access model compared to students who had the responsibility of sourcing their own course materials. This study used a standard p-value of .05 for both chi-square tests and t-tests, thus a resulting p-value less than .05 provides evidence of a statistically significant relationship between the variables and rejects the null hypothesis (McLeod, 2019a; Rose, 2014).

Chi-square results for all null hypothesis are as follows: **H<sub>01</sub>** ( $\chi^2$  (1,  $N = 2152$ ) = 3.44  $p > .05$ ), **H<sub>02</sub>** ( $\chi^2$  (1,  $N = 385$ ) = 3.86  $p < .05$ ), **H<sub>03</sub>** ( $\chi^2$  (1,  $N = 1127$ ) = .25  $p > .05$ ), **H<sub>04</sub>** ( $\chi^2$  (1,  $N = 640$ ) = 1.49  $p > .05$ ), **H<sub>05</sub>** ( $\chi^2$  (1,  $N = 1329$ ) = 2.62,  $p > .05$ ), **H<sub>06</sub>** ( $\chi^2$  (1,  $N = 823$ ) = 0.63,  $p > .05$ ),

**H07** ( $\chi^2 (1, N = 273) = 5.67, p < .05$ ), **H08** ( $\chi^2 (1, N = 1143) = .51, p > .05$ ), **H09** ( $\chi^2 (1, N = 548) = .11, p > .05$ ), **H010** ( $\chi^2 (1, N = 188) = .09, p > .05$ ), **H011** ( $\chi^2 (1, N = 398) = 0.88, p > .05$ ), **H012** ( $\chi^2 (1, N = 1476) = .94, p > .05$ ), **H013** ( $\chi^2 (1, N = 662) = 3.79, p > .05$ ).

There were mixed findings on the statistically significant relationships found at a p-value of .05 level throughout the study. However, the percent differences observed in the study showed that the inclusive access model consistently did have a positive impact on student outcomes. The implications of this are discussed further in the next chapter.

## **Chapter 5: Discussion and Implications for Practice**

The purpose of this quantitative, correlational study was to examine the impact on student outcomes when community college students were provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had to source their own required course materials. Furthermore, the study sought to understand if the use of an inclusive access program had a positive impact on student outcomes and course completion.

Data analysis used chi-square tests of independence to explore if a statistically significant relationship existed between the number of students who had their course materials provided to them on or before the first day of class, as part of an inclusive access program, compared to students who had to source their own required course materials. Chi-square is a suitable tool to explore the relationship between two variables and has been used in similar studies (Fischer et al., 2015; Pallant, 2016). To further explore this relationship, a t-test was performed on numeric grade means of inclusive access student and non-inclusive access student populations.

### **Overall – Student Outcome Implications**

Student outcomes were measured for students enrolled in one of three courses the semester before inclusive access was implemented and the same semester following implementation of the inclusive access program (Spring 2018/Spring 2019 and Fall 2018/Fall 2019). The study used historical, internal institutional data and no experimental study was conducted. Therefore, a two-semester study was used to account for similar variables not examined in this study. Overall, inclusive access had a positive impact on student outcomes for the total population, as well as by gender and by race.

### ***Grade Distribution***

In courses using an inclusive access course materials model, there was an increase in the percent difference of students who earned a letter grade ‘A’ (+9.60) and letter grade ‘B’ (+0.23). More importantly, there were large decreases in the percentage of students who earned a letter grade ‘D’ (-16.41) and letter grade ‘F’ (-9.23).

### ***Total Population***

Analysis of the total qualified study population ( $N=2152$ ) saw an increase (+3.88) in the percent difference of students who passed a class with a letter grade ‘C’ or better. The chi-square test produced a p-value of .064 and the t-test produced a p-value of .053. While t-test results indicate there is no significance between the means of inclusive access students and non-inclusive access students, there were positive increases in number of and mean numeric grades between the two groups of students.

### ***By Course***

All three courses (BUSA 205 +12.33, CISC 101 +1.56, PSYC 258 +3.24) examined saw an increase in the percent difference of students who passed a course with a letter grade ‘C’ or better when provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. For courses CISC 101 and PSYC 258, there was no statistically significant relationship found, in either chi-square test or t-test, between the number of students who passed a course with a letter grade ‘C’ or better or between the means of inclusive access students and non-inclusive access students. However, in course BUSA 205 the chi-square test of independence found a p-value of .049.

These findings are important because research suggests that grade point average (GPA) is a strong predictor to persistence and retention (David et al., 2015; Fralick, 1993; Gershenfeld et

al., 2016; McGrath, 1997; Nakajima et al., 2012). If more students are achieving a letter grade ‘C’ or better, those students are more likely to maintain a higher GPA and avoid situations like academic probation (Moody, 2019). The use of inclusive access programs may also help community colleges affect their first-year student retention rates, which nationally are around 62% (National Center for Education Statistics, 2020), through increased grade point averages.

Furthermore, these results may have implications on student engagement of course materials before assignments. Studies focused on student course materials engagement (Aagaard et al., 2014; Jolliffe & Harl, 2008; Landrum et al., 2012; Phillips & Phillips, 2007; Sappington et al., 2002) suggest that students who engage their course materials regularly perform better on tests and quizzes. Increasing access to student course materials can reduce a known barrier to student outcomes and in-class success (Skinner & Howes, 2013).

## **Gender/Race – Student Outcome Implications**

### ***Gender***

When comparing inclusive access courses and non-inclusive access courses, both female (+3.93) and male (+3.04) students had an increase in the percent difference of students who passed a course with a letter grade ‘C’ or better. However, there was no statistical significance found ( $p\text{-value} > .05$ ) when comparing by gender, the number of students who had their required course materials provided on or before the first day of class, as part of an inclusive access program, compared to students who had to source their own required course materials.

### ***Race***

In courses using an inclusive access course materials model, there was an increase in the percent difference of students who earned a letter grade ‘C’ or better with respect to all races in the study. While White (1.73), Hispanic (+1.61), and Other (+1.89) students saw slight increases

in the percent difference, Black (+20.35) students had a substantial increase in the percent difference of students who passed a course with a letter grade 'C' or better. There was no statistical significance found ( $p$ -value  $> .05$ ) in the number of and average grade for White, Hispanic, or Other race students who were enrolled in courses using an inclusive access compared to students who had the responsibility to source their own course materials. However, for Black students, the chi-square test returned a  $p$ -value of .017 and the  $t$ -test reported a  $p$ -value of .014. This is important not only because there was a larger percentage of Black students passing a course using an inclusive access program, but the  $t$ -test suggests that there is a significant increase in the numeric grade mean between students enrolled in a course using an inclusive access program and students having to source their own required course materials.

Underrepresented student populations like Black and Hispanic students face a number of challenges that vary from their White classmates (Chen, 2017; Jobe, 2013; Kern, 2000; Wood, 2014; Wood & Harris, 2015). Particularly, there are challenges for Black students that can derail their academic progress (Shannon, 2021). Furthering the importance of the findings in this study for Black students is the connection to the study's theoretical framework. Given the positive increase in mean numeric grades, it is possible that providing students with their required course materials as part of an inclusive access program increases a student's self-efficacy (Bandura, 1977) and their belief that their effort output will allow them to be successfully in passing a course (Vroom, 1995).

Research by Chen (2017) and Museus et al. (2012) suggest studies on student outcomes rarely address racial comparisons. Lack of racial comparisons are evident in similar studies that examine student outcomes with respect to having access to required course materials (Feldstein et al., 2012; Fischer et al., 2015; Hilton et al., 2013; Ryan 2019; Wakhungu & Yankelewitz,

2020; Winitzky-Stephens & Pickavance, 2017). The findings in this study contributes towards helping to fill the deficiencies in research of understanding how certain student outcome interventions could affect underrepresented student populations. The implications of a larger percent difference of students passing a class with a letter grade 'C' or better can affect a student's future academic prospects. At a community college, passing a class with a letter grade 'C' or better allows for the opportunity of the credit to be transferred to a four-year institution (Rochester Institute of Technology, n.d.). For underrepresented student populations this could make a big difference for their academic journey by eliminating an out-of-pocket financial barrier and providing access to course materials.

### **Incomplete/Withdrawal Implications**

When comparing inclusive access courses and non-inclusive access courses, this study found that there was a decrease (-8.23) in the percent difference of students who withdrew from a course or received a grade of incomplete. However, there was no statistical significance found ( $p$ -value  $> .05$ ) when comparing, the number of students who withdrew or received a grade of incomplete when their required course materials were provided on or before the first day of class, as part of an inclusive access program, compared to students who had to source their own required course materials. Despite not finding statistical significance, the percent difference between inclusive access and non-inclusive access courses could provide an opportunity for students to finish the course and receive a letter grade. While the credit they earned may not transfer, it may count towards the completion of their degree at the research site. By completing a course and receiving a letter grade, a student could achieve their Associate degree, certificate, or transfer to a four-year institution more quickly, consuming less of their time and financial resources.

### **Age – Student Outcome Implications**

During the analysis of the population sample, it was discovered that the mean study age was 25 years old. This age is the debatable line between the classification of traditional and non-traditional students (Ellis, 2019; Fortin et al., 2016). There is evidence that research on student outcomes for non-traditional students is scant (Chen, 2017; Gilardi & Guglielmetti, 2011). Analysis showed there was an increase (+5.86) in the percent difference of Students  $\geq$  Age 25 who passed a course with a letter grade ‘C’ or better when provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had to source their own required course materials. This finding required a chi-square test of independence and t-test to explore if a statistically significant relationship existed. The chi-square test of independence returned a p-value of .051 and the t-test on mean numeric grades returned a p-value of .044. This suggests that even though there is no statistically significant relationship, the use of an inclusive access program could provide support to non-traditional students in overcoming unique barriers to success. The unexpected findings of this study contribute towards helping to fill the deficiencies in research of understanding how certain student outcome interventions could affect non-traditional student populations (Chen, 2017; Ellis, 2019; Fortin et al., 2016).

### **Cost Savings Discussion**

Research has positioned course materials as a barrier to student success and course selection (Buczynski, 2007; Florida Virtual Campus, 2016; Salem, 2017, Senack, 2014a; Senack, 2014b; Sikorski et al., 2002; Textbooks Included, 2012). In two of the three courses examined in this study, students saw substantial potential cost savings, as part of an inclusive access course materials program, compared to students who had the responsibility of sourcing their own

required course materials. Each student enrolled in BUSA 205 (-\$72.25), CISC (-\$31.96), and PSYC 258 (-\$61.25) potentially saved a collective \$61,696.99 on their required course materials as part of an inclusive access program. This \$48.70 average savings per student is slightly less than the potential costs savings experienced by students in similar studies (McClendon & McMillan, 2020; Williams, Nichols, Cannon, Fountain, Smith, Yankelewitz, & Fritson, 2020). Regardless of the dollar amount potentially saved, the ability to include the cost of course materials as part of tuition and fees, and have it covered by financial aid, could impact how and when students take particular courses. Given the reliance on financial aid and Title IV funding for some students (Wood & Harris, 2015), an inclusive access course materials model may provide financial relief and increased course performance for students enrolled in these courses.

### **Limitations**

This study has several acknowledged limitations that affect its validity and reliability. The archival data collection for this study was restricted to three courses from a single community college in the Northeast. This restriction prevents correlation to other community colleges, their students, and/or courses, regardless of similarity of institutional and demographic characteristics. Errors during the institutional collection and extraction process could exist which could affect the outcome of the study and its results. Similarly, errors in the researcher's coding process could exist which effects the outcome of the study and its results. The researcher utilized Python, Excel, and an online chi-square calculator to perform the study's required data analysis. Rounding errors and bad coding could exist, which could affect the results of the study and its reliability. The researcher knows the research site, previously worked for the research site's bookstore management vendor, and made every effort to maintain objectivity. Finally, there may

be errors in data collection, calculations, and reporting that are unknown to the researcher that affect the study's outcomes, reliability, and validity.

Outside possible errors in data collection, extraction, format, and coding, a limitation of this study is the effect size. T-tests performed routinely returned an effect size below the standard of .2 which would represent a small effect size and well below the standard of .8 which would represent a large effect size (Madsen et al., 2019; McLeod, 2019c). The small effect size impacts the power of the study and the possibility of a Type II error. A Type II error occurs when the power (effect size) is insufficient to the extent that the researcher fails to reject a null hypothesis when there is significant effect between treatment and control (McLeod, 2019b; Sullivan & Feinn, 2012).

The study ran multiple tests with the same dependent variable, which increases the potential for Type I errors. A Type I error occurs when a researcher finds significance where there is no significance (McLeod, 2019c). Post hoc testing, such as a Bonferroni correction, can reduce Type I errors by adjusting down the p-value significance level (Armstrong, 2014; Coppock, n.d.). There was no post hoc testing completed to adjust p-values.

### **Future Research Discussion**

This is a call to action for external research on inclusive access programs by individual and third-party researchers. Comparable studies found were conducted, in part, internally by institutional representatives (Hurley & Fekrazad, 2020; McClendon & McMillan, 2020; Williams, Nichols, Cannon, Fountain, Smith, & Yankelewitz, 2020; Wakhungu & Yankelewitz, 2020). External studies on inclusive access are important to exploring the validity and reliability of such studies. Much like the extensive research on OER by external third-parties, research on inclusive access programs must continue to grow.

The lack of extensive research on inclusive access models on student outcomes creates a blank space for developing varying research designs or including certain student populations. This study asked specific questions and developed a specific research design to answer those specific questions. This section addresses future research suggestions the researcher considers important areas but does not cover all possible research scenarios. The intent is to inspire future research to further understand how inclusive access programs impact student outcomes and support student success across higher education.

This study was limited to three (3) courses at a community college in the Northeast. These courses were selected because they recently started using an inclusive access program. The study was limited to the student population of these courses. Future research would ideally focus on a larger before and after sample size. The recommendation is to achieve a larger and similar pre-inclusive access and post-inclusive access implementation sample size. This study only had a two-student difference between pre-inclusive access ( $N=1075$ ) and post-inclusive access ( $N=1077$ ). Other studies have had largely unequal populations (Williams, Nichols, Cannon, Fountain, Smith, Yankelewitz, & Fritson, 2020). This can be achieved by targeting larger enrollment classes or multiple community college campuses offering similar courses. A study on open educational resources attempted this across a mix of community colleges and four-year institutions (Fischer et al., 2015). However, it is the researcher's belief that using similar institutional formats and courses could be more powerful and provide an insight into the probability of passing a course with a letter grade 'C' or better.

An attempt to use a larger population sample and/or across multiple institutions could also provide an opportunity to understand inclusive access' impact on age, gender, and race. This study found a statistically significant relationship for Black students that increased mean numeric

grade averages by almost four points. Reducing barriers to success for underrepresented students and minorities will contribute to the research (Chen, 2017; Davila, 2011; Gershenfeld et al., 2016; Glenn, 2003; Jobe, 2013; Shannon, 2021; Wood, 2014; Wood & Harris, 2015) of how higher education could be more accessible to every student who wants the opportunity.

Further research could focus on varying research design and analysis. This study did not examine or attempt to establish predictability of passing a course with a letter grade ‘C’ or better when students are provided their required course materials on or before the first day of class, as part of an inclusive access program, compared to students who had the responsibility of sourcing their own required course materials. Future research could employ a mixed model to control for all variables and to attempt predictability of passing a course with a letter grade ‘C’ or better when enrolled in a course using inclusive access from historic archival data. While full predictability may not be achievable through this process, further statistical analysis may allow for statistical inference across similar population groups in varying geographical locations (Ehrenberg & Bound, 1993). To borrow from Ehrenberg & Bound (1993), to achieve full predictability of an inclusive access program’s role in helping more students pass a class with a letter grade ‘C’ or better, a full experimental study would need to be conducted. A full experimental study would include setting up different sections of the same course using an inclusive access materials model and sections of the same course where students were responsible for sourcing their own course materials. Ideally, such a study would be similar to Ryan (2019) who used the same instructors for OER and non-OER sections.

## **Conclusion**

An inclusive access course materials program may provide out-of-pocket financial burdens relief for students as well as help them pass a class with a letter grade ‘C’ or better. This

study did not find a statistically significant effect for any population with the exception of students enrolled in course BUSA 205 (p-value .049) and, generally, for Black students (p-value .017). However, each demographic variable studied saw an increase in the percentage of students who passed a course with a letter grade 'C' or better when provided their required course materials as part of an inclusive access program compared to students who had the responsibility of sourcing their own required course materials. This is important because grades of 'C' or better would provide more opportunities to more community college students to transfer their credits to a four-year institution and more students to complete courses. Thus, allowing them to complete their degree more quickly. There was a decrease (-8.28) in the percentage of students who earned a grade of incomplete or withdrew.

Research on inclusive access, at the current time, is extremely limited. The lack of research on the topic provides an opportunity for industry stakeholders to collaborate and explore research opportunities to further understand how inclusive access impacts student outcomes. There is not widespread use or acceptance of inclusive access programs which could provide an opportunity for experimental studies. Ultimately, continued research on inclusive access course material models is needed to understand how its use in practice benefits all higher education stakeholders.

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