The Accuracy of EdReady English as a Placement Tool at a Midwestern Community College Campus

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Abstract

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The Accuracy of EdReady English as a Placement Tool at a Midwestern Community College Campus

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Placement tests are utilized in community colleges to assess students' academic readiness in reading, writing, and math. Scores on these tests often determine whether students are placed directly into college-level courses or are required to take remedial classes. Previous research has shown that student outcomes in remediation are poor, and remedial coursework can cost additional funds and extend students' educational timelines. Studies have also shown that students of color and those from lower socioeconomic backgrounds are more frequently assigned to remediation, and many students are misplaced into remedial coursework when they could have been successful in college-level work. Therefore, it is critical that placement tests are examined for accuracy and equity.

A Large Midwestern Community College System recently adopted a new placement test called EdReady English to assess students' readiness in reading and writing. This quantitative study analyzed the accuracy of the EdReady English placement test at a selected campus of a Large Midwestern Community College System to determine how students who were placed by EdReady English performed in their first credit-bearing English course. Additionally, student subgroups were analyzed to determine if students' grades in the first credit-bearing English course varied by demographic factors such as age, race, and gender. Finally, the grades of students in the first credit-bearing English course were examined by placement method to determine how students who were placed by EdReady English performed compared to students who used other placement methods. The results of this study may be used to help policymakers and advisors determine the accuracy and equity of EdReady English as a placement tool.

Dedication

This work is dedicated to Grace McBride, a beautiful soul who is greatly missed. I hope my legacy is half as bright as yours.

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Finally, I would like to thank my students. This research started because of my passion to see you thrive. May this work contribute, even if ever so slightly, to the creation of a more equitable world for you.

Chapter 1: Introduction

Community college students comprise ⅓ of all students enrolled in postsecondary institutions in the United States (National Center for Education Statistics, 2020). Historically, community colleges have made higher education available to all students through their open admissions policies, which admit students of all levels of academic preparation. These policies have allowed community colleges to play a vital role in democratizing higher education for underserved groups (Burdman et al., 2015; Zook, 1947). Compared to four-year universities, community colleges serve a greater number of students who are first generation, racial or ethnic minorities, and Pell Grant recipients (National Center for Educational Statistics, 2019). However, before they can access the education provided by their local community colleges, many students must first take a placement test, which is a method used at 90% of two-year institutions nationwide (Belfield & Crosta, 2012; Hodges et al., 2020; Rutschow et al., 2019). These tests, such as the Accuplacer or COMPASS, are administered to students upon admission to assess their competencies in math, reading, and writing, ensuring that students have appropriate levels of academic preparedness to be successful in their college-level courses (Bettinger et al., 2013; Hodara et al., 2012; Hodges et al., 2020). If students achieve a set cut score, they are permitted to enroll in college-level, credit-bearing courses.

Students who do not test into college-level math or English courses through their scores on a placement test are most frequently assigned to remedial courses, which are designed to strengthen students' math, reading, and writing skills, but often do not count towards the completion of a degree (Belfield & Crosta, 2012). Almost 70% of community college students take at least one remedial course, and students average about three remedial courses each during their time in college (Chen & Simone, 2016). Unfortunately, four out of ten students assigned to remedial courses do not complete them (Bailey et al., 2010; Complete College America, 2012), and students who miss the placement test score

cutoff are often less likely to enroll in any classes, remedial or otherwise (Martorell & McFarlin, 2011; Ngo & Melguizo, 2016). Additionally, students who take remedial courses are less likely to complete their degrees or transfer to four-year institutions (Crisp & Delgado, 2014). This is because remedial courses must be completed as prerequisites for most credit-bearing, college-level courses. In this way, remedial courses serve as a critical entry point because they must be completed before students are able to take classes that count towards their degrees (Bettinger et al., 2013, Park et al., 2018; Scott-Clayton & Rodríguez, 2015). Remediation can be expensive, with an annual cost ranging from $2.2 million to $9.3 million per institution (Rodríguez et al., 2015). Despite colleges' significant investment in remedial courses, the student success rates are mixed (Bailey et al., 2010; Bettinger & Long, 2005; Boatman & Long, 2018; Chen & Simone, 2016). The enormous cost of remediation for students and for colleges coupled with low student transfer and completion rates has caused many community colleges to rethink the placement model and reconsider the use of placement tests to assign students to remedial education.

As colleges reevaluate their placement methods, they must address concerns about placement equity. For example, students who are Black and Hispanic and those from low socioeconomic backgrounds are more likely to be assigned to remedial courses by placement tests than White students and those from higher socioeconomic backgrounds (Barnett et al., 2020; Bettinger & Long, 2005; Brathwaite & Edgecombe, 2018; Chen & Simone, 2016; Crisp & Delgado, 2014). Additionally, placement tests tend to underestimate the abilities of racial and ethnic minorities (Geiser et al., 2007; Klasik & Strayhorn, 2018). Because community colleges serve a large number of students of color and individuals from low socioeconomic backgrounds (National Center for Educational Statistics, 2019), college leaders are looking for placement methods that provide greater equity and do not serve as a barrier for their students by deterring them from enrolling in college-level courses (Burdman et al., 2015; Deil-Amen &

Tevis, 2010; Stich, 2021; Venezia et al., 2010). Using an alternative measure for placement, such as high school grade point average (HSGPA), has been shown to narrow the equity gaps for racial/ethnic minorities and those from low socioeconomic backgrounds by reducing the number of these students assigned to remediation (Barnett et al., 2018; Belfield & Crosta, 2012; Brathwaite & Edgecombe, 2018; Crisp & Delgado, 2014; Ngo & Kwon, 2014). However, not all students have access to their high school transcripts, and some students have been out of high school for many years (Belfield & Crosta, 2012; Burdman et al., 2015; Scott-Clayton, 2012; Woods et al., 2018). Because assignment to remediation results in fewer accumulated credits, reduced transfer and completion rates, and lowered persistence (Bailey et al., 2010; Bettinger & Long, 2005; Boatman & Long, 2018; Chen & Simone, 2016), it is critical that students are not placed into such courses using inequitable or inaccurate metrics.

Studies have determined that placement tests are not predictive of students' college readiness (Allensworth & Clark, 2020; Maruyama, 2012). Research shows that placement tests, including the Accuplacer, COMPASS, and American College Test (ACT), often misplace students into remedial courses they do not really need (Belfield & Crosta, 2012; Leeds & Mokher, 2020; Melguizo & Ngo, 2020; Ngo, 2020). A misplacement occurs when a student is assigned to a college-level course and fails (over-placement) or is placed into a remedial course when they could have been successful in a college-level course (under-placement) (Scott-Clayton, 2012). Nearly ¼ of the students in one study were identified as wrongly placed using Accuplacer (Scott-Clayton et al., 2014), while another study found that ⅖ of students were assigned to take a remedial math class that they did not really need (Ngo, 2020). Ngo (2020) found that community college students were two to six times more likely to be under-placed into remedial courses than students in four-year colleges, even though they could have been successful in college-level classes (Ngo, 2020). Considering that community college students spend $920 million on

remediation each year (Jimenez, 2016), a misplacement into remedial education could be extremely costly for students and needlessly delay their educational timelines.

Many community colleges have begun to move away from commonly used placement tests like Accuplacer, made by the College Board, and COMPASS, made by American College Testing (Bettinger et al., 2013) in favor of other placement models that allow students to show proficiency using high school GPA (HSGPA) or their highest score in a high school English or math course (Brand, 2018; Burdman, 2012; Hodara et al., 2012). Other colleges have adopted personalized diagnostic testing to provide more targeted placement assessment (Edgecombe, 2016; Kalamkarian et al., 2015). One such assessment, called EdReady, has been developed by the NROC (Network, Resources, Open, and College and Career) Project, an organization that provides open-access resources for college and career preparation (The NROC Project, n.d.). EdReady is an online placement tool designed to deliver individualized online testing and instruction to help students refresh and develop their proficiencies in math, reading, and writing. Students can take an EdReady Math or EdReady English diagnostic test to assess their skills, and upon completion they will immediately receive a score based on their performance (EdReady, n.d.). If students meet a target score, which is the cut score set by their institution, they may enroll in college-level courses. If they do not, students are assigned a Study Path, which includes videos and other online supports like notes, practice exercises, and quizzes to refresh their skills. By progressing through the Study Path, which is an assigned set of modules based on the students' math and reading needs identified in the diagnostic test, students can improve their score (EdReady, n.d.). Institutions can determine the percentage of material in a Study Path, ranging from 1-100, that a student must master to qualify for enrollment in college-level courses.

EdReady has not published its validity and reliability statistics, but case studies reveal that EdReady Math increases access and completion of college-level courses (Hendrata et al., 2020; Methvin

& Markham, 2015; The NROC Network, 2016; The NROC Network, 2019). For example, Jacksonville State University replaced its previous placement test with EdReady Math, and one study showed that students who placed into their math courses using EdReady had higher passing rates than those who used Accuplacer (The NROC Network, 2019; Thornton et al., 2019). Another study at Nevada State College revealed that when EdReady Math replaced the Accuplacer as a math placement tool, students saved $800 on average by bypassing the remedial math course, and enrollment jumped from 24%-42% in the college-level math course (The NROC Network, 2016). These case studies focus on math placement, so it is unclear how EdReady English impacts placement into English courses. Additional states, such as Hawaii, Montana, Utah, Nevada, and Kentucky have adopted EdReady as a placement tool (Methvin & Markham, 2015). However, outcomes of EdReady at individual institutions are not well-known, and published reports focus solely on math outcomes (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; Thornton et al., 2019).

In keeping with best practices for placement equity and accuracy, a Large Midwestern Community College System (LMCCS) adopted EdReady in Spring 2020 as a new placement tool to assess students' readiness in math and English (reading and writing). At the LMCCS, students can demonstrate their college readiness using their Scholastic Aptitude Test (SAT), Preliminary Scholastic Aptitude Test (PSAT), or ACT scores, or they may provide transcripts to show they graduated from high school with a 2.6 GPA in the past four years. Students may also submit transcripts showing they have completed some college-level courses or have earned a college degree. Students who are not able to show their math and English competencies through any of these metrics are required to take EdReady for their placement or take remedial courses. The LMCCS has 19 campuses, but each campus uses the same cut scores for both math and English. Because each campus has unique student demographics, the accuracy of this placement test could vary campus by campus, depending on the geographic location and student

population. Therefore, it is essential to determine the accuracy of EdReady at each campus and in each area, both in math and English. Although previous studies have demonstrated that students placed by EdReady Math perform well in their first credit-bearing math courses (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; The NROC Network, 2019; Thornton et al., 2019), no extant research focuses on the accuracy of EdReady English as a placement tool. Additionally, it is unknown how accurately EdReady English places students into their first credit-bearing English courses at the LMCCS.

Statement of the Problem

Because placement tests determine whether students can enroll directly in college-level courses or are required to spend time and money on remedial classes, they essentially function as high-stakes tests (Elliot et al., 2012; Thornton et al., 2019). Since remediation is associated with many negative outcomes, including lack of persistence and completion (Bailey et al., 2010; Bettinger & Long, 2005; Boatman & Long, 2018; Chen & Simone, 2016), misplacement into a remedial course could be even more detrimental. Therefore, individual institutions and campuses must assess the accuracy and effectiveness of the placement tests they use (Atkinson & Geiser, 2009; Bracco et al., 2014; Kalamkarian et al., 2015; Scott-Clayton, 2012). One specific concern is whether these tests are harmful to already disadvantaged groups, such as racial and ethnic minorities (Elliot et al., 2012; Melguizo et al., 2014). It is unknown how EdReady English functions at the LMCCS or how accurately it works to place students into their first-year credit-bearing English courses. Since the LMCCS has an open access policy, it is important to ensure that the placement test used to provide or prevent admission to college-level courses is accurate and equitable. This is of particular importance for the first credit-bearing English course, Introduction to Composition, which is required for the completion of every major at the LMCCS. It is

unknown how accurately the current test, EdReady English, places students at this campus of the LMCCS into the first credit-bearing English course.

Purpose of the Study

Although several studies have examined the accuracy of popular placement tests like Accuplacer, SAT, ACT, and COMPASS (Bettinger et al., 2013; Elliot et al., 2012; James, 2006; Mattern et al., 2009; Medhanie et al., 2012; Ngo & Melguizo, 2016; Scott-Clayton et al., 2014), there is no extant research on the accuracy of EdReady beyond that published by NROC (The NROC Network, 2016; The NROC Network, 2019). Additionally, existing research on EdReady's placement outcomes focuses on EdReady Math (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; The NROC Network, 2019; Thornton et al., 2019), but the accuracy of EdReady English is unknown. The purpose of this causal comparative quantitative study was to analyze the placement accuracy of the EdReady English placement tool utilized at one campus of the LMCCS. Specifically, this study examined students' scores on the EdReady English test and their performance in their first credit-bearing English course, ENGL 111: English Composition. Although this study evaluated the placement accuracy at one campus, it filled a gap in the research by providing insights into the usefulness of EdReady English as a placement test as well as its accuracy in a community college setting. Additionally, this study analyzed the ENGL 111 grades of students placed by EdReady English across student groups to determine if there were differences in the accuracy by age, race, or gender, and it compared the ENGL 111 grades of students placed by EdReady English to the grades of those placed by other methods, such as the SAT, ACT, PSAT, Accuplacer, HSGPA, previous degree or coursework, or remedial classes. This generated useful data about how EdReady English functions across student subgroups and in comparison to other placement metrics.

Research Questions

This study explored the following three questions:

Research Question 1 (RQ1): How accurately does the EdReady English test place students into their first credit-bearing English course, ENGL 111?

a. What is the relationship between students' scores on the EdReady English placement test and their grades in the first credit-bearing English course, ENGL 111?
b. What scores on the EdReady English placement test predict success (C or higher) in the first credit-bearing English course, ENGL 111?

Research Question 2 (RQ2): How do grades in the first credit-bearing English course (ENGL 111) vary for different student subgroups (age, race, and gender) placed using the EdReady English assessment?

Research Question 3 (RQ3): How do the ENGL 111 grades of students placed into their first credit-bearing English course by EdReady English compare to the ENGL 111 grades of students placed by other criteria (Accuplacer, ACT, co-requisite, high school GPA, previous coursework or previous degree, PSAT, remedial coursework, or SAT)?

Significance of the Study

Because many students must take the EdReady English placement test before enrolling in credit-bearing courses at the LMCCS, this assessment serves as a gateway to college enrollment. Therefore, it is essential that this metric accurately and equitably identifies students who will be successful in their first credit-bearing English course. Because English is a required course for all majors at the LMCCS, it is essential that the placement metric being used to assign students to the first credit-bearing English course is not only accurate, but consistently accurate across different student subgroups. This study furthers the understanding of how EdReady English operates at a community college and how accurately it places students into their first credit-bearing English course. This generated useful data that

may help college leaders determine whether EdReady English is an accurate tool for English placement, which could improve placement at this campus and others in the LMCCS. Additionally, other colleges and institutions who use or are considering using EdReady English may benefit from the results of this study. The study also examined how accurately EdReady English placed students of various subgroups into their first credit-bearing English class. The results of this study could help college leaders, advisors, and policymakers determine whether EdReady English is accurate as a placement tool for different student subgroups. Finally, by comparing the grades of students placed by EdReady English to those placed by other methods, the study revealed whether students placed by EdReady English had similar outcomes as those placed using alternate assessments. This may help college leaders and advisors determine the usefulness of EdReady English for students at their own institutions. Since the accuracy of EdReady English is unknown and student outcomes in English are unclear, it is critical to determine if students are being placed fairly and appropriately by this measure, given that a misplacement could cost students time and money. Therefore, evaluation of this assessment is critical to ensuring that students who are indeed academically prepared for their English courses are granted access without unnecessary hindrance and that students who need additional academic support are properly identified.

Definition of Terms

Accuplacer- Accuplacer is a placement test created by the College Board. Accuplacer Next Generation, which was used by the LMCCS from 2019-2020, contains three sections: reading, writing, and math (College Board, 2017). Accuplacer's Writeplacer tool, which assesses students' ability to write essays, can be used in combination with the Accuplacer Next Generation.

College-level courses- Like credit-bearing courses, these classes begin with a 1 or higher and count toward the completion of a degree.

Community college- Community colleges, formerly known as junior colleges, are open access public two-year institutions that serve their local communities by providing low-cost technical certificates, associate degrees, and transfer pathways for four-year institutions. A community college offers an associate degree as its highest degree (Cohen et al., 2014).

Co-requisite model- This is a design for remediation popularized by the Community College of Baltimore County (Adams et al., 2009) in which students who need remediation are concurrently enrolled in a remedial English course and a college-level English course. The co-requisite remedial course is designed to support students in the college-level English course and is often taught by the same instructor as the college-level English course.

COMPASS- This placement test, which was discontinued in 2016, was created by the ACT and featured assessments of math, reading, and writing.

Credit-bearing courses- These courses count towards the completion of a degree or credential. Some courses, such as remedial classes, benefit the student but do not count for degree completion.

Dual credit- Dual credit students are high school students who are taking a high school class that also fulfills a college requirement, providing them dual credit for the course (U.S. Department of Education, n.d.).

EdReady- EdReady is an adaptive, modular placement test that assesses students' readiness in math, reading, and writing (The NROC Project, n.d.).

First credit-bearing English course: The first credit-bearing English course at the LMCCS is ENGL 111: English Composition, which emphasizes critical reading and writing, research, and composition skills.

FW grade: The Large Midwestern Community College System uses the letters FW to indicate when a student has failed a class because they stopped attending (but did not formally withdraw).

Gateway course: A course is considered a gateway or gatekeeper if it is a required pre-requisite for several other courses (Belfield & Crosta, 2012; Bettinger et al., 2013; Park et al., 2018; Scott-Clayton & Rodríguez, 2015). Remedial classes are considered gateway courses because they are required for students to enroll in most other college-level courses (Bracco et al., 2014). Without passing these classes, students have limited options of credit-bearing courses in which they can enroll.

High school GPA: This refers to a student's cumulative grade point average in high school, which is submitted via transcript at the LMCCS.

Large Midwestern Community College System (LMCCS): This statewide community college system in the Midwest has 19 campuses that share central governance.

Modular instruction: This kind of instruction uses a computer program to create personalized modules designed around a student's needs. The student typically takes an initial diagnostic test, works through the content of the modules at their own pace, and moves to a new module once mastery has been demonstrated (Burdman, 2012; Kalamkarian et al., 2015).

Multiple methods placement- In this placement model, colleges allow students to show competency in math, reading, and writing skills through a number of methods, including high school GPA, SAT/ACT scores, or courses taken in high school.

Over-placement- Students who are considered over-placed tested into the first credit-bearing math or English course, but are unlikely to pass (Scott-Clayton, 2012).

Placement accuracy- This refers to how well a test measures the outcome it is intended to measure (Scott-Clayton, 2012). In the case of this study, a placement test should measure students' readiness in college reading and writing.

Placement test- This is an assessment used to evaluate students' college readiness in math, reading, or writing. It is often used to predict students' abilities to perform well in college-level courses, but it can also be used to identify students who need remediation.

Remedial courses- Sometimes called developmental courses, these classes usually begin with a 0, do not count for college credit, and aim to provide math, reading, or writing instruction for students who are identified as lacking sufficient academic preparation to be successful in their college-level courses.

Remediation- This refers to the courses and supports available for students who lack appropriate academic preparation in college math, reading, or writing.

Study Path- This is an assigned set of units determined by the EdReady diagnostic test. It includes lessons, exercises, and quizzes that students can complete to build their skills (EdReady, n.d). Once students have studied the content, they can retake a test in a specific lesson or take a test on an entire unit. Answering questions accurately will raise the target score.

Target score- This is a number from 1-100 that represents the amount of content a student has mastered in EdReady (EdReady, n.d.). For example, a score of 80 indicates that 80% of the content has been mastered. Institutions can set their own target scores, which must be reached for students to enroll in college-level courses.

Under-placement- Students who are under-placed are assigned to remedial education although they could have been successful in a college-level math or English course (Scott-Clayton, 2012).

Withdrawal-Unlike a course drop, which happens in the first few weeks of the semester, results in a 100% refund for the course, and is not recorded on a student's transcript, a withdrawal is recorded on a student's transcript and occurs when a student withdraws from a course after the college's official drop period has passed (Wheland et al., 2012). Withdrawals can impact students' financial aid, and course drops do not. At the LMCCS, a withdrawal is marked on a transcript with the letter W.

Chapter 2: Literature Review

Introduction

Community colleges have open admissions policies that, in theory, provide college access to everyone by admitting students of all levels of academic preparation. However, before they enroll, many students must take a placement test to determine their college readiness in math, reading, and writing (Barnett & Reddy, 2017; Bettinger et al., 2013; Belfield & Crosta, 2012; Burdman, 2012; Hodara et al., 2012; Hodges et al., 2020; Horn et al., 2009; Hughes & Scott-Clayton, 2010; Melguizo et al., 2014; Saxon & Morante, 2014; Scott-Clayton, 2012; Scott-Clayton et al., 2014; Venezia et al., 2010). The results of these tests can place students in remedial math or English courses, causing additional costs and delays in their educational timelines (Attewell et al., 2006; Bailey et al., 2010; Complete College America, 2012; Crisp & Delgado, 2014; Horn et al., 2009; Leeds & Mokher, 2020; Martorell & McFarlin, 2011; Merisotis & Phipps, 2000; Scott-Clayton et al., 2014; Scott-Clayton & Rodríguez, 2015). Students who do not test into college-level math or English courses through their scores on the placement tests are most frequently assigned to remedial courses, which are designed to strengthen students' math, reading, and writing skills, but often do not count towards the attainment of a degree. On average, 70% of community college students will take at least one remedial class, and about half of those students will take more than one (Chen & Simone, 2016). However, studies show that as many as half of the students assigned to remedial education courses do not complete them (Bailey et al., 2010; Complete College America, 2012; Martorell & McFarlin, 2011). Additionally, students who barely miss the placement test score cutoff are often less likely to enroll in any classes, remedial or otherwise (Martorell & McFarlin, 2011; Ngo & Melguizo, 2016), demonstrating the deterring effect of assignment to remediation for some students. Even students who manage to complete remedial courses are less likely to attain their degrees or transfer to four-year institutions than students who were not assigned to remediation

(Attewell et al., 2006; Crisp & Delgado, 2014). The unsatisfactory outcomes of remedial education highlight the critical role of the placement methods used to indicate which students may enroll in credit-bearing courses and which must take remediation.

To improve the placement process, many colleges are moving away from high stakes placement tests like the Accuplacer, made by the College Board, and COMPASS, made by ACT, in favor of multiple measures placement methods that allow students to show proficiency using their high school GPA (HSGPA) or highest grade in an English or math course (Bahr et al., 2019; Barnett et al., 2020; Brand, 2018; Burdman, 2012; Ganga & Mazzariello, 2019; Hodara et al., 2012; Melguizo et al., 2014; Ngo & Kwon, 2014; Woods et al., 2018). Other colleges have adopted personalized diagnostic testing to provide more targeted placement assessment (Edgecombe, 2016; Kalamkarian et al., 2015). One such test is EdReady English, a new online placement tool developed by The NROC Project in 2014 to deliver individualized testing and instruction to help students refresh and develop their reading and writing skills (EdReady, n.d.).

EdReady English has been adopted by a Large Midwestern Community College System (LMCCS) to place students into their first-year English composition courses. Although studies show placement by EdReady results in reduced assignment to remedial courses and increased enrollment and persistence in college-level courses (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; The NROC Network, 2019), it is unknown how accurately and equitably students at the LMCSS are being placed by this measure. Additionally, previous studies focus solely on EdReady Math (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; The NROC Network, 2019; Thornton et al., 2019), so it is unknown how accurately EdReady English places students into their first credit-bearing English courses.

The purpose of this study was to measure the accuracy of EdReady English as a placement test at one campus of a LMCCS. The following sections will provide context for the role of placement tests in higher education, concerns about their equity and accuracy, the function of placement tests in community colleges, and the rise of new placement methods that improve the precision of placement. Finally, EdReady English, which was the focus of this study, will be explained, including its history, use in institutions of higher education, and its role at the LMCCS.

History of Placement Tests

Placement tests were originally designed as objective measures of college readiness (Arendale, 2011; Nettles, 2019). The explosive growth of secondary schools in the twentieth century meant that students applying for college had varying levels of academic preparation (Nettles, 2019). Placement tests were created to provide a standard measure of what students know and to foster a more meritocratic system to allow a greater number of students access to college (Arendale, 2011). Founded in 1890, the College Entrance Examination Board aimed to design an objective measure to standardize placement decisions in universities (Arendale, 2011). Later, the College Entrance Examination Board instituted the first common admissions assessment for universities in 1900 (Cohen et al., 2014). The SAT was first administered in 1926 (Nettles, 2019), and current estimates show 2.2 million students took the College Board's SAT in 2020 (College Board, 2021). Although the SAT was the dominant test for several decades, competing ideas of college readiness led to the creation of the ACT. Administered by the American College Testing Company, the ACT was first introduced in 1959 as a measure of achievement rather than aptitude (Nettles, 2019). Although less popular than its counterpart, the SAT, the ACT was taken by 1.78 million students in 2019 (ACT, 2020). The SAT and ACT represent two different approaches to assessing college readiness, yet both views have come under scrutiny in recent years.

Conflicting Views of Placement Tests

Conflicting views about the purpose of placement tests have created different approaches to these assessments. For instance, ACT test creator E.F. Lindquist aimed to create a test that would measure what students had learned in high school (Nettles, 2019). However, the College Board created the SAT to measure students' aptitude, or what they are capable of learning (Arendale, 2011). Scholars today still argue whether placement tests should predict students' aptitude or measure what they have already learned (Geiser et al., 2007; Saxon & Morante, 2014; Stemler, 2012). The emphasis on achievement or aptitude guides institutions of higher education to prioritize one assessment over another. Others believe the purpose of a placement test is to identify students who need remediation. More recently, some colleges have prioritized placement tests that assign students with high chances of success into a credit-bearing course and place students who are not predicted to be successful into remediation (Behrman & Street, 2005; Medhanie et al., 2012). Common placement tests like the Accuplacer or COMPASS are intended to identify students who will be successful in their first credit-bearing math or English courses and those who need additional academic support (Barnett et al., 2018; Bettinger et al., 2013; Melguizo et al., 2014). These tests typically include a threshold score or range that advisors can use to place students in appropriate courses. However, some scholars believe threshold scores dichotomize college readiness, a tenuous quality that is also difficult to measure (Maruyama, 2012; Saxon & Morante, 2014). Placement tests may only provide a snapshot of students' readiness on a given day, not a comprehensive picture of their college readiness (Bahr et al., 2019; Barnett & Reddy, 2017; Klasik & Strayhorn, 2018). Problematically, the content of these placement tests is not always aligned to what students learned in high school, causing some scholars to argue that the purpose of placement tests should be to coordinate high school and college curricula (Burdman, 2012; Hodara et al., 2012). These divergent beliefs about the purpose of placement tests have created a variety of

placement test options to suit the needs of different institutions. For example, the College Board makes the Accuplacer, which is one of the most common placement tests used in community colleges (Barnett et al., 2018; Bettinger et al., 2013; Melguizo et al., 2014). The Accuplacer's rival, the COMPASS, was made by the ACT. This illustrates how emphasis on either achievement or aptitude can create wide variation in how students are placed in institutions across the country.

College Readiness

Placement tests are intended to measure college readiness, but there is not a common, shared definition of this term (Bailey et al., 2008; Conley, 2007; Hodara et al., 2012; Klasik & Strayhorn, 2018; Kurlaender & Larsen, 2013; Maruyama, 2012; Ngo et al., 2021; Strayhorn, 2014). There is not now, nor has there ever been, a college admissions standard shared by all universities and institutions of higher education (Cohen et al., 2014). In fact, several studies point to a misalignment in the K-12 curriculum and academic expectations in higher education (Atkinson & Geiser, 2009; Kurlaender & Larsen, 2013; Melguizo & Ngo, 2020; Merisotis & Phipps, 2000; Mokher et al., 2017; Venezia et al., 2010). Essentially, high schools assess students using their own college readiness metrics, and some students graduate and find that colleges have different definitions of readiness (Kurlaender & Larsen, 2013; Melguizo & Ngo, 2020). One popular definition comes from Conley (2007), who defined college readiness as success in a first-year credit-bearing course without the need of remediation. However, Klasik & Strayhorn (2018) argued that this definition is too narrowly defined, given that readiness varies for two-year and four-year institutions. They found that readiness differed among racial groups and by college selectivity, emphasizing that readiness is not dichotomous. Another study using data from the Educational Longitudinal Study uncovered that historically underrepresented groups, such as ethnic minorities and women, showed varying levels of college readiness (Strayhorn, 2014). Specifically, different factors, such as time spent studying, perception of high school math preparation, or talking with a faculty member,

had differing impacts on college readiness for the groups in the study, demonstrating that college readiness is not monolithic. A wider definition of college readiness has been recommended by those who wish to see the inclusion of non-cognitive factors, such as motivation and student interest (Stemler, 2012). New models for placement like the WICS (Wisdom, Intelligence, Creativity, Synthesized) theory or the Rainbow Project attempt to capture broader definitions of college readiness such as creativity and wisdom (Sternberg et al., 2012). Because there is variation in the types of placement tests administered, the aims of such tests, and definitions of college readiness, students in different states and even on campuses within the same state could have very different placement experiences and outcomes.

Challenges to Placement Tests

In recent years, placement test staples like the SAT, ACT, and Accuplacer have come under scrutiny for their lack of predictive ability (Belfield & Crosta, 2012; Burdman, 2012; Bracco et al., 2014; Ganga & Mazzariello, 2019; Scott-Clayton et al., 2014). For example, one study found the Accuplacer did not have strong predictive power regarding students' performances in first-year math and English courses (Medhanie et al., 2012). Another study of placement in a statewide community college system found that neither Accuplacer or COMPASS were positively correlated with college GPA or the number of college credits students accumulated (Belfield & Crosta, 2012). Other studies have revealed no significant correlation between Accuplacer scores and letter grades in first-year courses (Elliot et al., 2012; James, 2006). However, College Board, maker of the Accuplacer, recommends using their test in consideration of other placement data like high school transcripts, and they do not support using the Accuplacer score as the only criteria for placement (College Board, 2019).

Researchers have found that HSGPA is a stronger predictor of college readiness than the ACT and/or SAT (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Belfield & Crosta, 2012; Bowen et al., 2009; Geiser et al., 2007; Koretz et al., 2016; Scott-Clayton, 2012; Zwick & Sklar, 2005). In a study of

student data in the Chicago School System and the Integrated Postsecondary Education Data System, HSGPA was found to be the most accurate predictor of college graduation and success (Allensworth & Clark, 2020). A comprehensive review of student placement scores in Kentucky and the City University of New York found that HSGPA is the strongest predictor of future GPA, placing it above both the SAT and ACT (Koretz et al., 2016). A study of a statewide community college system found HSGPA was more predictive of college performance than Accuplacer or COMPASS (Belfield & Crosta, 2012), and a more recent study determined HSGPA was a stronger predictor of college graduation than the ACT (Allensworth & Clark, 2020). Researchers point out that HSGPA is a measure of students' academic competencies since it is collected over several years (Allensworth & Clark, 2020). Additionally, HSGPA may capture noncognitive traits like motivation, determination, and effort (Belfield & Crosta, 2012; Bowen et al., 2009). These findings have led many colleges and universities to rethink their placement models or to incorporate HSGPA to improve the accuracy of students' placement (Koretz et al., 2016). However, HSGPAs may overpredict the college readiness of minority students (Klasik & Strayhorn, 2018). Conley (2007) also criticized HSGPA as a college readiness indicator since it does not account for factors like students' behaviors and attitudes. HSGPAs may also vary based on the academic rigor of the school; for example, one study found that students at more academically challenging high schools had lower HSGPAs than those of students at schools with less rigor (Allensworth et al., 2020). Additionally, high school transcripts may be difficult to use because some students may not have access to their high school records, or they may have been out of high school for a significant time, making the records less relevant (Belfield & Crosta, 2012). These challenges to HSGPA underscore the need for placement measures to be both accurate and equitable.

The COVID-19 pandemic created more logistical challenges to the use of placement tests in college admissions since testing centers were forced to close in many states during lockdown

procedures across the country (Backstrom & Schultz, 2022; Hoover, 2021; Marcus, 2021). This led many colleges to adopt test-optional policies, where students had the choice to submit test scores. This test-optional movement was already gaining momentum by 2020 in smaller, liberal arts colleges (Backstrom & Schultz, 2022; Belasco et al., 2015); however, the pandemic accelerated its spread. In fact, by 2021, nearly ¾ of four-year colleges had adopted test-optional policies (Marcus, 2021). Although this was mainly out of necessity due to pandemic restrictions, some states like California, Colorado, and Illinois have made test-optional policies permanent (Backstrom & Schultz, 2022). However, the future of test-optional policies remains unclear. Some colleges, like the University of Tennessee, are adopting test-optional policies temporarily to allow time for policymakers to determine the long-term impact of the change (Backstrom & Schultz, 2022; Hoover, 2021). Because the future of test-optional policies remains unclear, colleges must continue to assess the best methods for appropriately placing students.

Student placement involves the navigation of multiple tensions since colleges must assess many students in a manner that gives each student the best placement. One set of tensions is between accuracy and efficiency (Scott-Clayton et al., 2014). For instance, multiple-measure placement methods have been found to be more accurate than traditional placement tests, but the collection of the data for those measures and the cost of additional staff to support the processes can make this method less efficient for larger school systems (Bracco et al., 2014; Burdman, 2012; Ganga & Mazzariello, 2019). Another tension exists between flexibility and standardization. Standardizing placement tests across a state would ensure that students had a consistent placement experience and that campuses shared definitions of readiness; however, individual campuses may prioritize different readiness measures or placement tools to meet the needs of their specific student populations (Hodges et al., 2020; Hodara et al., 2012; Kurlaender & Larsen, 2013; Venezia et al., 2010). Placement tests must be authentic to a college's definition of college readiness, but practical enough to be used across campuses (Klasik &

Strayhorn, 2018). Because students arrive with different levels of preparation and a variety of needs, placement tests must be both flexible and precise (Maruyama, 2012). Measures must be flexible enough to accommodate fluctuations in readiness, but they must be precise enough to deliver an accurate assessment for each student. This is challenging when colleges use placement scores to predict students' performances because predictive models are based on group trends that cannot always identify how an individual student will perform (Scott-Clayton et al., 2014). These tensions highlight the challenges colleges face when selecting and administering placement methods. Despite the original purpose to use placement tests to measure students objectively, competing ideas of college readiness and the purposes of placement create subjectivity in the placement process.

Inequity in Placement

Placement tests may appear to be objective measures, but they do not always assess students equitably (Martorell et al., 2015). For example, the SAT and ACT have faced accusations of inequity, particularly in their placement of students of color and individuals from lower socioeconomic backgrounds (Atkinson & Geiser, 2009; Bowen et al., 2009; Geiser et al., 2007; Nettles, 2019; Smith & Reeves, 2020). Additionally, SAT and ACT scores tend to underpredict the performance of ethnic minorities (Klasik & Strayhorn, 2018). However, evidence of bias exists in placement measures other than these two tests. In general, students in higher socioeconomic brackets tend to outperform students of lower socioeconomic backgrounds in measurements of college readiness (Martorell et al., 2015; Strayhorn, 2014). This has caused some to assert that placement tests are essentially a proxy for socioeconomic status (Geiser et al., 2007; Strayhorn, 2014). Even placement measures like HSGPA can overpredict the college readiness of Black and Hispanic students (Scott-Clayton, 2012; Zwick & Sklar; 2005), highlighting the heterogeneity of college readiness and the challenges of accuracy in placement. In fact, Zwick and Sklar (2005) found differences in the predictive power of the SAT for students by

language, noting that the SAT is more predictive of college graduation for Hispanic speakers of English than for Hispanic speakers of Spanish. The effectiveness of placement tests not only varies by student demographics, but by the overall selectivity of the institution (Bowen et al., 2009). The potential for inequality in placement test outcomes can lead to disparities in the assignment of students to remedial education.

Historically, students of color and those from lower socioeconomic backgrounds are overrepresented in remedial courses (Attewell et al., 2006; Bailey et al., 2008; Brathwaite & Edgecombe, 2018; Chen & Simone, 2016; Crisp & Delgado, 2014; Kosiewicz & Ngo, 2020; Ngo et al., 2021). The disproportionate representation of minority students is related to bias in placement tests, which were not originally designed to support minority students (Nettles, 2019). In their longitudinal study of community college students in Ohio, Bettinger and Long (2005) found that 75% of Black and Hispanic students were placed into remedial math, and 68% were placed into remedial English using the COMPASS placement test. In a study of developmental education reforms in New York, Brathwaite and Edgecombe (2018) found Black students and recipients of Pell Grants were more likely to be placed in remedial English and math than their White counterparts. Another study found that female, Latinx, and Black students were more frequently assigned to remedial math courses that they did not need, and this impact was most pronounced for Black students (Ngo & Melguizo, 2020). Given that students who take remedial education may have their educational timelines extended and incur undue costs, bias in the placement process could place an additional burden on minority students. Since placement tests are used by some colleges to sort students into perceived ability groups, these tests can even reproduce structural inequities in the K-12 system (Stich, 2021). Specifically, students who have already attended poorly resourced schools may find themselves in a lower track when they are assigned to remedial education in college due to their scores on a placement test (Ngo & Melguizo, 2020). These inequities in

placement indicate that placement tests may serve as a barrier for some students, preventing them from accessing college courses as easily as those from more privileged backgrounds.

Placement as a Barrier

Because placement tests often reflect racial and socioeconomic inequities, some scholars suggest that they serve as a barrier rather than an objective measure (Atkinson & Geiser, 2009; Burdman, 2012; Burdman et al., 2015; Nettles, 2019). This is particularly pronounced for students who are from ethnic minority groups or from families with fewer resources. Two significant qualitative studies have revealed that placement tests are poorly understood by students, and their results are often misinterpreted. Deil-Amen and Tevis (2010) found that minority students viewed the ACT as a measure of innate intelligence and did not study because they felt it would not have an impact on their score. Students in this study with low ACT scores experienced anxiety, discouragement, and self-doubt. These results were echoed by Venezia et al. (2010) in a study of community colleges in California, where students reported confusion about what the placement tests meant, how to prepare, and whether they could retake them. This effect was more pronounced for first generation students. Students in the study reported feeling discouraged when they learned the results of the tests would place them in remediation. Students in both studies reported confusion because they initially thought the placement test was a low-stakes assessment, but they learned the results of the test added extra classes and time to their degree (Deil-Amen, 2010; Venezia et al., 2010). Students' frustration rose when they realized they would have limited college options because of their placement scores. Additionally, students may experience an opportunity cost when they take a placement exam since most tests are proctored and students must take time off work, obtain childcare, and arrange their day to sit for a placement exam (Bailey et al., 2008; Rodríguez et al., 2015). Students who cannot get off work, find childcare, or get transportation to the testing centers may not be able to take the placement test at all.

Students placed into remediation, which can be viewed as the low track by some students, may feel confusion and diminished agency after learning about their placement test results (Stich, 2021; Venezia, 2010). Students who do not score above a placement threshold may view their results as a signal that they are not ready or welcome at an institution (Atkinson & Geiser, 2009; Bettinger & Long, 2005; Moss et al., 2018; Ngo et al., 2021; Papay et al., 2016; Scott-Clayton & Rodríguez, 2015). As students realize they must take one or more remedial classes before they can begin earning college credit, they may face a cooling off period where they experience discouragement because of perceived signals that they are unprepared for the rigors of higher education (Clark, 1960). However, the impacts of this signaling are heterogenous and may depend on results of the placement test. For example, some students may be deterred from enrollment if they are assigned to take several remedial courses, but those who only need to take one may not be discouraged (Martorell et al., 2015). Other students, such as those from lower socioeconomic backgrounds, may be more sensitive to labeling (Papay et al., 2016). In their study, Papay et al. (2016) discovered that students had an emotional reaction to being labeled not ready for college because of their test scores, and such labeling deterred students from lower socioeconomic backgrounds and those with lower levels of academic preparation from pursuing college enrollment. These challenges underscore the need for colleges to find ways to ensure their placement test is a measure that does not create additional obstacles for students, particularly those from underserved populations.

History of Open Access Policies at Community Colleges

Historically, the aim of community colleges has been to make higher education more accessible to all people (Arendale, 2002; Boggs, 2011; Gilbert & Heller, 2013; Zook, 1947). Since their inception, junior colleges, now called community colleges, have existed to democratize higher education by providing education for everyone (Cohen et al., 2014; Zook, 1947). The Truman Commission Report of

1947 cemented a clear role for community colleges as the source of expansion of higher education for Black students and female students, as well as those for whom college costs were a barrier (Gilbert & Heller, 2013). Additionally, the location of community colleges made higher education accessible to a greater number of students (Cohen et al., 2014). As four-year institutions expanded in the early twentieth century, community colleges became the premiere location of academic preparatory courses (Arendale, 2011; Boylan, 1988; Cohen et al., 2014). Unlike more selective four-year institutions, community colleges serve local communities by providing occupational training, associate degrees, and transfer pathways for four-year universities (Boggs, 2011).

Students of any level of academic preparation can attend community colleges. Because of this accessibility, community colleges have been challenged to address the needs of students with low levels of academic preparation (Dougherty & Townsend, 2006; Hughes & Scott-Clayton, 2011). After all, denial of access to college could amount to a denial of opportunity (Clark, 1960). Community colleges must keep admission open for all students; nevertheless, they must maintain the rigor of their courses to meet transfer obligations with four-year institutions. Protecting access would mean allowing all students to enroll directly into college-level classes regardless of academic skill, and protecting academic standards would require that all students who need appropriate remediation can receive it (Perin, 2006). This is problematic because there can be a discrepancy between the academic preparedness of some students and the expectations of college-level coursework, which Clark (1960) referred to as conflict between the means of student ability and the ends of higher education. Allowing all students, even those who are unprepared, to enroll in courses for which they are not likely to be successful can lead to lower student outcomes (Saxon & Morante, 2014). Therefore, community colleges must uphold open access policies in a way that promotes student success (Boggs, 2011; Dougherty & Townsend,

2006; Ngo & Kwon, 2015). This means placing students into courses they can successfully complete, which involves using some assessment to ascertain students' skill levels before they begin.

Opponents of placement testing view these assessments as a violation of community colleges' open access policies. For example, Ali-Coleman (2019) argued that community colleges are not open access in practice if students are denied admission to credit-bearing courses because of their performance on a placement test. Burdman et al. (2015) agreed, noting that community colleges compromise their democratizing impact on higher education when they use placement tests to divert students from enrollment. This is, in part, why California prohibited using standardized tests alone to assess students' college readiness (Bahr et al., 2019). Much like the tensions that exist in placement testing design, the conflict between admitting all students and ensuring each student can succeed dominates placement discussions in community colleges.

Placement Tests in Community Colleges

There is very little consistency regarding the use of placement tests in community colleges (Attewell et al., 2006; Barnett & Reddy, 2017; Hodara et al., 2012; Hodges et al., 2020; Jimenez et al., 2016; Kurlaender & Larsen, 2013; Melguizo et al., 2020). Colleges differ in how tests are administered, whether they are proctored, how they are delivered (paper and pencil or computer-based), or whether the tests take place all at once or are spread over several days (Rodríguez et al., 2015; Venezia et al., 2010). By the 1970s, most community colleges had begun using placement tests to screen students for academic ability (Cohen et al., 2014). Now 38 states have legislation requiring placement tests for remedial education, and many still use Accuplacer, the SAT, or the ACT (Hodges et al., 2020). In Florida, placement tests have been eliminated, but high school students may still take a state-designed readiness test (Hodges et al., 2020; Park-Gaghan et al., 2020). Additionally, cut scores for placement tests vary widely throughout the colleges in a state, and campuses within the same city may even have

different cut scores (Hodara, 2012; Melguizo et al., 2014; Venezia et al., 2010). This has led to calls for revision of the placement process, which differs so greatly from campus to campus that assignment to remediation can appear arbitrary (Attewell et al., 2006; Bailey et al., 2010; Burdman et al., 2015; Merisotis & Phipps, 2000). Because of these criticisms, community colleges across the country are reevaluating their placement methods.

Common Placement Methods

The primary placement tests used in community colleges are the Accuplacer, made by the College Board, and the COMPASS, which was made by the ACT (Barnett et al., 2018; Bettinger et al., 2013; Bickerstaff et al., 2016; Jimenez et al., 2016; Melguizo et al., 2014). The COMPASS was discontinued, in part, because it failed to accurately place students into college-level courses (Fain, 2015). These tests have been shown to have varying levels of accuracy. The COMPASS is more accurate at predicting which students will earn a high grade in a college course than identifying who will simply pass (Hughes & Scott-Clayton, 2011). Similarly, Accuplacer was found to be more accurate at predicting which students would earn a B or higher in a math or English course than identifying who would earn a C or D, making it a limited predictor of which students could pass a college-level course (Belfield & Crosta, 2012; Mattern et al., 2009; Scott-Clayton, 2012). Another study found that Accuplacer was less accurate in placing students in English than in math, but COMPASS was less accurate in placing students into math courses (Belfield & Crosta, 2012). In addition to these tests, colleges may use multiple measures placement, which incorporates many factors such as HSGPA, courses taken in high school, and student perception surveys (Bahr et al., 2019; Ganga & Mazzariello, 2019). The variation of placement methods across the country and within states creates challenges for researchers looking to identify effective placement policies.

Over half of community colleges now use multiple measures placement, which utilizes more than one measure of readiness, such as HSGPA, courses taken in high school, and scores on standardized tests (Ganga & Mazzariello, 2019; Hodges et al., 2020). Multiple measures placement may involve weighing various placement data in a formula, creating a hierarchy of measures, or using alternate placement information when a student narrowly misses a placement test cutoff score (Bracco et al., 2014). Despite the variations in implementation, multiple measures placement has been shown to be more accurate at predicting college readiness than traditional, single-score metrics (Bahr et al., 2019). A study from the Center of the Analysis of Postsecondary Readiness measured the outcomes of students placed using a traditional placement test or multiple measures placement in the State University of New York (Barnett et al., 2018). The study revealed that using a multiple measures algorithm placed 14% of students higher in math and 41% of students higher in English than those who used a traditional placement test.

Supporters of multiple measures argue that it can also improve the accuracy of placement because it encompasses a broader view of college readiness than single-score placement tests (Barnett et al., 2020; Maruyama, 2012). For example, using decision tree methods, Bahr et al. (2019) found students' cumulative GPA and scores in subject-specific courses were strong predictors of college success and persistence. Additionally, researchers have discovered that multiple measures placement increases equity for Black and Hispanic students by improving their placement outcomes (Barnett et al., 2018; Koretz et al., 2016; Ngo & Kwon, 2015; Scott-Clayton et al., 2014). In fact, even test makers of the SAT and ACT recommend using their placement tests in conjunction with other factors to make placement decisions (Allen & Radunzel, 2015; Burdman et al., 2015; College Board, 2019). Multiple measures placement, which is sometimes called a test-flexible policy, has also become popular among

four-year schools, which were forced to adopt new placement procedures during the COVID-19 pandemic (Hoover, 2021; Marcus, 2021).

Although results of multiple measures placement are promising, over half of community colleges are still using the Accuplacer or SAT/ACT scores for placement (Hodges et al., 2020). This is, in part, because multiple measures placement can be cumbersome and costly to execute, particularly for large systems (Hodara et al., 2012). Multiple measures placement involves increasing staff, creating new data collection mechanisms, and evaluating the validity of the system (Bracco et al., 2014). Additionally, institutions cannot always acquire high school transcript information (Daugherty et al., 2021), and many students do not have access to their high school transcripts (Burdman et al., 2015; Markle & Robbins, 2013; Woods et al., 2018). Another study discovered that faculty are skeptical of using high school transcript information for placement, finding it too subjective (Ngo et al., 2021). Students may challenge the seemingly subjective nature of multiple measures placement more frequently than single-score placement tests, which appear more objective (Bracco et al., 2014). Using high school transcripts could also slow down the placement process, as reviewing transcripts is a timely and labor-intensive process (Belfield & Crosta, 2012). Moreover, placement tests like Accuplacer have well-established reliability and validity, but combining reliable measures with less reliable measures can reduce the accuracy of the placement process (College Board, 2019). Indeed, Belfield and Crosta (2012) discovered that HSGPA was the only strongly predictive high school data point, and information like courses taken or Advanced Placement credits accumulated did not improve the predictive strength of HSGPA. Again, the tension between efficiency and accuracy are clear when colleges debate whether to adopt multiple measures placement.

Some colleges allow students to self-place or provide students with advising for directed self-placement (Coleman & Smith, 2020; Felder et al., 2007; Kosiewicz & Ngo, 2020). In this method,

students can complete a self-evaluation of their skills, including their highest levels of high school math and English courses completed, and decide whether to enroll in remedial or college-level classes based on information they receive about the courses. Other variations permit students to complete a self-evaluation and confer with an advisor about their placement options. This model is utilized in Florida, which eliminated all placement testing statewide (Park et al., 2018). Community college students in Florida may meet with their advisor and receive information on placement before deciding whether to enroll in remedial courses (Park et al., 2020). Results of the self-placement method have been mixed, with some studies showing that minority and female students tend to be overrepresented in remedial courses under the self-placement or directed self-placement model (Kosiewicz & Ngo, 2020). Indeed, Coleman and Smith (2020) reported that some students felt pressured to enroll in lower-level courses by their advisors, and the researchers warned that faculty or advisor bias could negatively impact self-placement equity. However, Park-Gaghan et al. (2020) found that eliminating placement tests increased enrollment and completion of first-year math and English courses for all students, particularly for Hispanic and Black students. Florida's elimination of placement tests accompanied a range of other revisions, such as changes to how remedial courses are delivered (Park et al., 2018); therefore, it is unclear if directed self-placement alone is an effective method. A study of self-placement at American River College determined that the grades in the first credit-bearing math course of those students who self-placed were comparable to the grades of those who placed using the COMPASS (Felder et al., 2007). However, Coleman and Smith (2020) found that misplacement occurred when students made errors on their self-assessment forms. They also discovered that 50% of students did not follow the placement recommendation on the self-assessment form. Additionally, most of the research on self-placement focuses on math outcomes (Felder et al., 2007; Kosiewicz & Ngo, 2020), so less is known about English self-placement data.

Another new placement method involves personalized diagnostic testing that assigns students into specific online modules for remediation (Bickerstaff et al., 2016; Edgecombe, 2016; Hendrata et al., 2020; Kalamkarian et al., 2015; Rodríguez, 2014; Weiss & Headlam, 2019). For example, in 2011, the Virginia Community College System created a diagnostic math placement test that aligns with specific modules that correspond to nine math competencies (Edgecombe, 2016; Kalamkarian et al., 2015). The diagnostic test identifies the specific math competencies requiring remediation, and students only need to complete remediation in the modules identified by the test. Students then sign up for one semester where they work through the assigned modules using instructional software that directs them through the skills in the module at their own pace (Kalamkarian et al., 2015). Results of one study found that this new Virginia placement test raised enrollment in the first credit-bearing math course higher than the previous placement test, the COMPASS (Rodríguez, 2014). However, another study found that students in Virginia who tested into 1-5 modules had only an 18% chance of completing the first credit-bearing math course within one year of placement (Bickerstaff et al., 2016), and Rodríguez (2014) found that pass rates in the first credit-bearing math course dropped after implementation of the new placement test. A similar placement method has been utilized in the North Carolina Community System, which created a math diagnostic test to correspond to eight math competencies. Each competency is represented in a one-credit module that lasts four weeks (Kalamkarian et al., 2015). This kind of placement, which combines a diagnostic test with assigned modules, personalizes the remediation assignment and allows students to bypass remedial instruction on topics they do not need (Bickerstaff et al., 2016; Kalamkarian et al., 2015). However, this is a newer approach, so research is still being conducted on its effectiveness.

Equity in Placement at Community Colleges

Community colleges have wrestled with the challenges of ensuring equity in the placement process. Historically, placement tests have been presented as low stakes exams, but they are high stakes in reality because they can add time and additional costs for students who are assigned to remediation (Burdman, 2012; Hughes & Scott-Clayton, 2011). These costs can be particularly harmful to students in vulnerable populations. It is this disparate impact that has caused some states like California and Florida to eliminate placement tests. When Florida eliminated placement testing in 2013 with Senate Bill 1720, the total number of students enrolling and passing gateway courses increased, particularly among Black and Hispanic students (Park et al., 2018). An additional study found that eliminating placement tests closed the equity gap for Black and Hispanic students, whose passing rates in math and English became similar to their White counterparts after the passing of the bill (Park-Gaghan et al., 2020). Two studies have found that students would experience greater academic success if they all were allowed to bypass remedial education altogether and enroll directly into credit-bearing courses since misplacement into remedial education is creating a greater harm (Belfield & Crosta, 2012; Scott-Clayton, 2012). A recent comprehensive study in Texas revealed that some student groups, such as those with limited English proficiency and those from disadvantaged socioeconomic groups performed better when placed directly into college-level courses instead of remediation (Daugherty et al., 2021). Since community colleges typically have more racially diverse students, more first-generation students, and more students from lower socioeconomic backgrounds than most four-year universities (National Center for Education Statistics, 2019), they must be particularly sensitive to policies that replicate or create inequity (Kosiewicz & Ngo, 2020). Therefore, community college systems across the country have been aiming to select equitable placement methods to avoid misplacing students into remediation.

Remediation Outcomes

Students who do not test into credit-bearing courses are typically assigned to remediation, which is costly and can have mixed or negative effects for students (Bettinger & Long, 2005; Boatman & Long, 2018; Crisp & Delgado, 2014; Martorell & McFarlin, 2011). Colleges can spend between $300,000-$800,000 annually on placement tests, which is a fraction of the annual amount colleges spend on remediation instruction, typically $2.2-$9.3 million dollars (Rodríguez et al., 2015). Other estimates place the national cost of remediation in higher education at an annual $1.3 billion (Jimenez et al., 2016). Remediation has been a critical component of higher education since its beginning, when Harvard was the first school to offer remedial courses for students who were not academically prepared in subjects like Latin (Arendale, 2011; Merisotis & Phipps, 2000; Nettles, 2019). Today, almost 70% of community college students will take at least one remedial course, and students take a total of 2.9 remedial courses on average (Chen & Simone, 2016). Remediation plays a critical role in community colleges because more community college students need remediation than students who attend four-year schools (Jimenez et al., 2016). Despite the popularity of these courses, research shows that students face more negative outcomes the longer they stay in remediation. For example, students assigned to remedial education complete fewer credits and are less likely to transfer to four-year institutions (Bettinger & Long, 2005; Crisp & Delgado, 2014; Martorell & McFarlin, 2011). A study covering five states and over 27 colleges found that many students do not enroll in remedial classes after taking a placement test, and as many as 50% of students assigned to take remedial courses do not complete them (Bailey et al., 2008). In fact, ⅓ of students in one study who were assigned to remediation did not complete any college credits in a three-year period (Bailey et al., 2008). A critical longitudinal study of outcomes in Texas found that remedial education had no positive impact on labor markets (Martorell & McFarlin, 2011). Additionally, remediation can be expensive for community college students, who spend $920 million on

remedial courses annually (Jimenez et al., 2016). In some cases, students deplete their financial aid on remedial courses that do not even count towards a degree (Bailey et al., 2008).

Supporters of remedial education note that students with less academic preparation may have lower outcomes as a result, which is not necessarily caused by a remediation intervention (Bettinger & Long, 2005; Bettinger et al., 2013). A few studies have found that remedial education benefits students with very low levels of academic preparation, particularly in math (Boatman & Long, 2018; Mokher et al., 2017). Another study found that community college students benefited more from remedial instruction than students attending four-year institutions (Attewell et al., 2006). It is also possible that remediation is successful for students who need it, but the aggregated results of remediation outcomes are impacted by a great number of students who are assigned to remediation unnecessarily (Scott-Clayton & Belfield, 2012; Scott-Clayton & Rodríguez, 2015). Because of the variety of placement methods used to assign students to remediation, Melguizo et al. (2015) argued that the results of remediation likely correspond to the accuracy of the placement. Therefore, when students are placed appropriately into remediation, it is more likely to be beneficial. The results of remediation are mixed at best, particularly since there is considerable variation in the design of remedial programs and approaches to placement. Because students may face many negative outcomes in remedial education, it is critical to ensure they are initially placed correctly and accurately.

Because student remediation outcomes have historically been poor, one attempt to redesign remediation has grown in popularity. The co-requisite model, started in the Community College of Baltimore County in 2007, is designed to shorten the amount of time students spend in remediation by concurrently enrolling them in remediation and a college-level English course (Adams et al., 2009). Initially called the Accelerated Learning Program, this model involves having 20 students enrolled in a college-level English course: 10 who are students in the co-requisite model and 10 students who are

placed directly into college-level English (Adams et al., 2009). The same instructor teaches the college-level English class with 20 students and the co-requisite English class where the 10 students receive additional academic support to pass the college-level course. Initial data showed that students in the co-requisite class were more likely to pass the college-level course than students who took stand-alone remediation (Adams et al., 2009). Additionally, the initial data showed co-requisite students had lower withdrawal rates than students in stand-alone remediation, and co-requisite students passed the college-level English class at similar or greater rates than students who tested directly into the class. Since the introduction of the co-requisite model in Baltimore County, other community colleges have adopted the same or similar approach, finding students in the co-requisite model were more likely to pass the first credit-bearing English class than students who took stand-alone remediation (Cho et al., 2012; Jaggars et al., 2015; Ran et al., 2022). Students in the co-requisite model are also more likely to persist in their education than students who complete traditional remediation (Jaggars et al., 2015; Ran et al., 2022). The co-requisite model showed such promise nationally that Complete College America recommended adoption of this model as a best practice in its landmark report on remediation (Complete College America, 2012). Nevertheless, remediation reform is only as effective as the placement tools that initially put students there.

Student Misplacement

Of particular concern is where to set placement cut scores, given that remediation outcomes are bleak for many students. Four out of ten students assigned to remedial education courses do not complete them (Bailey et al., 2010; Complete College America, 2012). Therefore, the placement score must be set appropriately to avoid putting students into remediation who do not need those services. For example, if the cutoff score is too high, students will be placed into remediation unnecessarily, causing significant delays in their educational timelines (Melguizo et al., 2015). Students in community

colleges may experience misplacement more frequently than students at four-year institutions (Ngo, 2020). For example, Melguizo and Ngo (2020) examined math misalignment in students enrolled in a large community college district in California and found that ¼ of the students who tested as college ready in high school were required to take remedial math in college. In a study using data from the Educational Longitudinal Study of 2002, researchers determined that 20% of all students took a math course they did not need, and over 40% of students placed into remedial math did not really need the course (Ngo, 2020). The author referred to this as redundant math, a term used when students are assigned remedial math courses they do not need. A landmark study found that students are more often under-placed, which means they are assigned to a remedial course even though they could be successful in a credit-bearing course (Scott-Clayton et al., 2014). Another study of a statewide community college system found that three out of ten students were misplaced by the Accuplacer and COMPASS (Belfield & Crosta, 2012). Unfortunately, misplacement in community college can have harmful effects on students' educational trajectories.

Misplacement can have great costs for students and colleges. A Texas study of remediation outcomes revealed that students who tested just below the placement cutoff were less likely to complete courses within one year of taking the placement test (Martorell & McFarlin, 2011). This finding was duplicated in a study of placement tests in California, where researchers found that students who tested just below the cutoff score completed fewer credits in their first year and were less likely to enroll in a credit-bearing math course (Ngo & Melguizo, 2016). In a landmark study of two and four-year institutions in Tennessee, Boatman and Long (2018) found that students who tested a few points under the cutoff score were less likely to complete their degrees. Given the negative impact on students placing just below the score, placement thresholds must be carefully set. Researchers have recommended lowering the cut score to reduce placement errors (Ngo & Melguizo, 2016; Scott-Clayton

et al. 2014) or adjusting the cutoff scores in response to placement outcome data (Melguizo et al., 2015). This would benefit students and institutions because a misplacement can cost colleges $324 per student per remedial course (Rodríguez et al., 2015). However, to make nuanced decisions about how to place students more appropriately, community colleges need data about the impact of such changes at their own campuses.

Placement Accuracy

Several measures can be used to assess the accuracy of placement tests. Measures of success differ, so the accuracy of any placement test depends on the variables selected (Hughes & Scott-Clayton, 2011; Scott-Clayton, 2012). Placement accuracy is largely a function of how appropriate placements are defined. Belfield and Crosta (2012) noted that the accuracy of any given placement test depends on how it is used. For example, one definition of appropriate placement is a test that identifies students who have a low chance of being successful in the credit-bearing course and those who have a high chance of success (Sawyer, 1996). If the placement is appropriate, both groups will perform well in their assigned classes. Another approach is to examine how accurately a test predicts how students will perform in a future course, also known as predictive validity. The typical approach to predictive validity is to examine the placement scores of students in connection to their grades in the first credit-bearing math or English course (Bowen et al., 2009; College Board, 2019; James, 2006; Medhanie et al., 2012). According to the American Educational Research Association et al. (2014), the validity of a test is a function of how appropriately the evidence supports the proposed use of a test. Therefore, a placement test is only as valuable as its correlation to students' performance in the course it is designed to predict (Armstrong, 1999). One such study of Accuplacer's predictive validity using correlations between the placement scores and course grades found that the test placed students accurately 70% of the time, controlling for statistical artifacts (Mattern et al., 2009). In a variation of this approach, Zwick and Sklar (2005)

evaluated the effectiveness of HSGPA and SAT scores using college graduation rates. In another study, placement validity was examined using decision theory models (Sawyer, 1996). However, this approach has not been duplicated in subsequent research.

Critics of placement validity studies argue that they are based on faulty understanding since placement tests are not able to capture all the factors that contribute to a student's success (Saxon & Morante, 2014). Others argue that the data from correlation coefficients are limited because students who test into remediation receive a treatment, a remedial course, thereby interfering with the outcome data, the course grade or completion (Belfield & Crosta, 2012; Scott-Clayton, 2012). Additionally, correlations do not take socioeconomic factors into account (Atkinson & Geiser, 2009). Some scholars have noted that placement scores can be challenging to evaluate since they assess students' readiness with a single score (Brathwaite & Edgecombe, 2018; Saxon & Morante, 2014; Scott-Clayton & Rodríguez, 2015). In one study of students in Florida's college system, researchers found that students with the highest levels of academic preparation had only an 82% chance of passing the first credit-bearing English course (Woods et al., 2018). This underscores the challenge of examining correlations, revealing that many factors are involved in passing a course. Therefore, there are limits to evaluating the predictive accuracy of placement tests.

An influential study by Scott-Clayton (2012) generated a metric for placement accuracy called the severe error rate. Based on diagnostic accuracy, often measured in the medical field, the severe error rate is a measure of how accurately a placement test identifies students in need of a treatment, in this case, remedial education. The severe error rate is calculated from a predictive model that uses data obtained from a regression of the characteristics of students who were placed into a college-level course and did not take remediation. Using the data from that regression, Scott-Clayton (2012) analyzed students of similar preparation and academic levels who were placed into remediation. This data yielded

four categories of students: those properly placed in remediation, those in remediation who would be successful in a college level course, those who were appropriately placed in a college-level course, and those who were placed in a college-level course but would not likely be successful. The percentage of students predicted to be improperly placed is called the severe error rate (Scott-Clayton, 2012). This metric was applied in a later study of a large urban community college system and a statewide community college system, where the authors found that ⅓ to ¼ of students were misplaced (Scott-Clayton et al., 2014). The severe error rate was used to analyze the Accuplacer and COMPASS in a statewide community college system, and the authors discovered that students were severely misplaced by both assessments (Belfield & Crosta, 2012). In a 2016 study, Ngo and Melguizo used the severe error rate to examine the accuracy of placement in a large California community college district, finding an increase in placement errors after the district switched from a diagnostic test to Accuplacer. More recently, Leeds and Mokher (2020) used the severe error rate to calculate the accuracy of Florida's Postsecondary Readiness Test (PERT), finding that ¾ of the students placed in the upper levels of remedial English courses could have been successful in a credit-bearing English course. However, to calculate the severe-error rate, a researcher must have access to students' HSGPAs and course transcript information, which can be difficult to collect from community college students (Burdman et al., 2015; Markle & Robbins, 2013). Without complete high school transcript information, the sample size in the study must be reduced, and the sample will include younger students who recently graduated high school (Belfield & Crosta, 2012). Therefore, the effectiveness of calculating the severe error rate for placement methods will be reduced in institutions where complete high school transcript information is not available for many students or in colleges where most students have not recently graduated from high school.

Accuracy rates can vary for math and English placement methods (Bahr et al., 2019; Barnett et al., 2020; Belfield & Crosta, 2012; Hughes et al., 2010; Leeds & Mokher, 2020; Mattern et al., 2009; Scott-Clayton, 2012). In general, placement tests are more accurate at predicting which students will be successful in math than in English (Hughes et al., 2010; James, 2006; Scott-Clayton, 2012; Scott-Clayton et al., 2014). In fact, the Accuplacer, the most common placement test, was found to be more accurate in predicting which students would earn a B in their first credit bearing math course than those who would do so in their first credit-bearing English class (Belfield & Crosta, 2012; Mattern et al., 2009; Scott-Clayton et al., 2014). This may explain why students placed into remediation by English placement tests are more frequently misplaced than those placed into remedial math (Leeds & Mokher, 2020; Scott-Clayton et al., 2014). Even alternate placement methods have varying accuracy for English and math. For example, in their analysis of multiple measures placement in California community colleges, Bahr et al. (2019) discovered that cumulative HSGPA needed to be higher for accurate placement into math courses than for English courses. In a study of community colleges in New York, Barnett et al. (2020) found that multiple measures placement methods allowed higher numbers of students to bypass remedial English than remedial math. Similarly, Woods et al. (2018) examined placement methods for community colleges in Florida and found that multiple measures placement methods provided greater benefit to students in English than math, as more students tested out of remedial English using this placement method. These findings underscore the need for separate analyses of math and English placement methods.

English Placement

Community colleges most commonly assess students' college readiness in reading and writing using placement tests, specifically, the COMPASS and the Accuplacer (Bettinger et al., 2013; Hodara et al., 2012; Hodges et al., 2020; Horn et al., 2009; Hughes & Scott-Clayton, 2010). Mattern et al. (2009)

determined that the Accuplacer was 70% effective at predicting college readiness in English. However, some studies have found the Accuplacer is not as predictive of English readiness than math readiness (James, 2006; Scott-Clayton et al., 2014). Colleges may use the SAT and the ACT in addition to the Accuplacer to assess students' reading and writing competencies. In fact, one study comparing the accuracy of the Accuplacer and the SAT Writing section found the SAT to be more accurate for placement into first-year composition courses (Elliot et al., 2012). Students in community colleges may not have SAT or ACT scores, so additional measures must be available to assess such individuals (Burdman, 2012). Some colleges have designed their own writing or reading placement tests for greater accuracy, theorizing that a locally generated test will be more closely aligned with local curriculum. For example, Behrman and Street (2005) found that locally created, content-specific reading tests yielded more accurate placement results than content-general tests such as the Accuplacer and COMPASS. However, the time, effort, and personnel required to create, validate, and evaluate a new placement test makes locally created tests more challenging, especially for larger community college systems (Burdman, 2012; Hodara et al., 2012). Additionally, some colleges are using multiple measures to assess students' reading and writing readiness, using an algorithm that incorporates HSGPA, English courses taken (including any advanced placement credit), SAT or ACT scores, and student self-evaluation information (Allensworth et al., 2020; Bahr et al., 2019; Barnett et al., 2020). These measures can be more accurate, but they are also more time-consuming and labor-intensive to create and execute (Barnett et al., 2020; Burdman et al., 2015; Hodara et al., 2012; Woods et al., 2018). Each placement method has various levels of accuracy depending on the geographic region and institution, so it is critical for each college and even individual campuses within an institution to evaluate the accuracy and effectiveness of the placement methods used with their own student populations (Coleman & Smith, 2020; Ganga & Mazzariello, 2019; Horn et al., 2009; Melguizo et al., 2014).

First-year English composition courses are considered gateway classes because they are required for most college majors, and students cannot move forward in their degrees until these courses are passed (Park et al., 2018; Scott-Clayton & Rodriguez, 2015). Typically, these first-year courses focus on composition skills such as essay writing, research and citation practices, and clear and effective written communication. Unfortunately, first-year composition courses tend to have high withdrawal rates. For example, a multi-year study of a community college system in Texas uncovered that composition courses have a 14.3% withdrawal rate (McKinney et al., 2019). However, the rate of withdrawals in English composition courses can point to multiple factors. Because students can withdraw until nearly the end of the semester at most institutions, withdrawal rates can reflect students who are earning an undesirable grade and wish to withdraw rather than earn a grade that will negatively affect their GPA (Armstrong, 1999). In their study of withdrawal rates, Wheland et al. (2012) uncovered that students may withdraw from an English class for a variety of reasons, such as dislike of the instructor or teaching style, difficulty with course concepts, or even personal matters. Additionally, the modality of the English course can affect withdrawal rates. One study found that students who take English composition in a traditional in-person format have lower withdrawal rates than students who take the course virtually or online (Bourdeau et al., 2018). It is also possible that students who are mistakenly placed into the first-year composition class withdraw when they discover they are not academically prepared for the course (Scott-Clayton et al., 2014).

EdReady English

EdReady English is a placement tool developed by the NROC Project to deliver individualized online testing and instruction to help students refresh and develop their skills in critical reading and writing (EdReady, n.d.) The NROC Project is an organization that provides free and low cost open-access resources to institutions to promote academic, college, and career readiness (The NROC Project, n.d.).

The NROC online content has been adapted into the EdReady English platform (EdReady, n.d.). When students use EdReady English as a placement tool, they can take the initial online EdReady diagnostic test to assess their skills and receive a score based on their performance (EdReady, n.d.). If students meet their target score, a specific cut score set by their institution, they may enroll in their college-level courses. If they do not, they are assigned a Study Path, which includes lessons with videos, practice exercises, and quizzes to refresh their skills. The individualized instruction provides instant feedback, so students can immediately see how they are progressing in their path (Hendrata et al., 2020). By working through the lessons in the Study Path, a set of units based on students' reading and writing needs identified in the diagnostic test, students can improve their target score. Institutions can determine what percentage of the material in a Study Path, ranging from 1-100, a student must master to qualify for enrollment in college-level courses (EdReady, n.d.). If the institution indicates that a student must master 70% of the content to enroll in the first credit-bearing English course, then a student must reach a target score of 70. Institutions can also select the content of the diagnostic test, choosing material from the following ten units: Introduction to College Reading and Writing, Identifying Main Ideas, Discovering Implied Meaning, Interpreting Bias, Analysis through Definition, Learning across Disciplines, Exploring Comparative Elements, Informed Opinions through Causal Chains, Applied Critical Analysis, and Using Sources in Critical Reading and Writing (EdReady English Table of Contents, n.d.). The ability to customize the material of the diagnostic test is one advantage EdReady offers.

The EdReady English placement tool offers many features that benefit community colleges. For example, students can take the placement test at home with no time constraints (Bickerstaff et al., 2021; Thornton et al., 2019). In this way, EdReady addresses some of the testing barriers presented by other placement methods. Specifically, students do not have to take time off work, secure childcare, or drive to a testing center (Bailey et al., 2008; Rodríguez et al., 2015). This makes EdReady a more low-

stakes placement test than the Accuplacer or COMPASS, which are proctored exams, because students can take it on their own time, at their own pace, and in their own environments (Bickerstaff et al., 2021; The NROC Network, 2019). Because EdReady allows students to build their skills and retest, students can save money on remediation costs (Hendrata et al., 2020; The NROC Network, 2016; Thornton et al., 2018). This is because students can work through the lessons of the Study Path, retest, and raise their target score. Because it is an adaptive, personalized tool, EdReady provides students with immediate feedback on their progress (Bickerstaff et al., 2016; Hendrata et al., 2020). This offers students greater autonomy over their learning and allows them more opportunities to master the content (Bickerstaff et al., 2016). Additionally, students can save valuable time with EdReady by bypassing remedial courses that may have prolonged their educational timelines (Methvin & Markham, 2015; Thornton et al., 2018). Students who use EdReady tend to enroll and complete their first-year courses at greater rates than those who placed using traditional methods like the Accuplacer or COMPASS (The NROC Network, 2019; Thornton et al., 2018). Finally, the ability to customize the content of diagnostic tests makes it flexible for institutions that need to adapt the content for the needs of the local community (Methvin & Markham, 2015). Although these features appear attractive, very little research is available on the outcomes of students who are placed using this tool.

Nevada State College used EdReady Math as a remedial option for students in 2016 and found that students saved $800 on average by eliminating the need for remedial courses (The NROC Network, 2016). Additionally, the school saw enrollment in introductory math courses jump from 24% to 42% after students began using EdReady Math for remediation (Nevada, 2019). In another case study, Jacksonville State University began using EdReady Math as a placement test in 2019. Results showed students who placed into college-level math courses with EdReady Math had more passing grades and fewer withdrawals and incompletes than those who placed using the traditional SAT or ACT test (The

NROC Network, 2019). University of Hawaii high school students used EdReady Math to improve their scores on the COMPASS, and 76% of students were able to move up one or more levels in their math placement after using the Study Path (Methvin & Markham, 2015). Additionally, EdReady Math was used at a large, Hispanic-serving institution in a three-week winter math boot camp to help remediate students. With EdReady Math, 65% of the students were able to test out of remedial education, saving them at least one semester of remedial coursework (Hendrata et al., 2020). Each of these studies shares the results of EdReady Math, but little is known about how well EdReady English works to assess and prepare students in English. Nationally, EdReady is being used as a placement test in higher education in Nevada, Hawaii, and Kentucky, and as a college readiness preparatory tool in Montana and Utah (Methvin & Markham, 2015). However, a review of the literature revealed no extant research on the accuracy of EdReady English as a placement tool.

To improve placement equity and accuracy, a LMCCS adopted EdReady English as a placement test in Spring 2020. The LMCSS has set a statewide target score for entry into college-level English courses. Across the state, students at each campus must achieve a 70 or higher on EdReady English to enroll in the first credit-bearing English course, ENGL 111: Introduction to College Composition. Students who do not meet the target score can work on an individualized Study Path that includes free online resources like videos, practice exercises, and quizzes. After students meet the target score, they are eligible to enroll in ENGL 111. EdReady English allows students the option to bypass remedial non-credit courses if they wish, saving them time and money. Students still have the choice to take remedial education courses, particularly if they place very far from the target score. For example, if a student receives a score of 30 on the diagnostic test, they will need to decide if they want to spend time working in the Study Path to raise that score to a 70, which could take many hours (EdReady, n.d.). Students can work with their advisor to determine if they would prefer to work on the Study Path to raise their score

to 70 or if they wish to take a remedial English course. Some students may not learn best using an online, adaptive format, and they may prefer to take a remedial class to refresh their skills. Because EdReady English is new, data is limited on the accuracy of its use as a placement test. Additionally, it is unknown how EdReady English functions as a placement tool for English courses, and it is also unclear how EdReady serves as a placement tool for English courses at LMCCS.

Summary

Despite the prevalence of scholarship on the accuracy of the SAT, ACT, Accuplacer, and COMPASS, there is very little known about the accuracy of EdReady English as a placement method. If the accuracy of the test cannot be determined, its usefulness as a placement tool is questionable at best and detrimental at worst (Scott-Clayton, 2012). Given that misplacement into remediation generates well-documented negative outcomes, community colleges must prioritize the accuracy and equity of their placement measures. Researchers have emphasized that colleges must evaluate the accuracy of placement tests at their own campuses (Atkinson & Geiser, 2009; Burdman, 2012; Coleman & Smith, 2020; Ganga & Mazzariello, 2019; Horn et al., 2009; Melguizo et al., 2014) because what works well for one institution may not be effective at another. Evaluation is particularly critical because placement tests can have a negative effect on already disadvantaged students like racial/ethnic minorities and those in poverty (Barnett et al., 2020; Elliot et al., 2012). Therefore, this study seeks to examine how accurately EdReady English is placing students into their first credit-bearing English courses at the LMCCS and if the placements are equitable to all students, thereby upholding open access policies and the promise of community colleges to serve all students well.

Chapter 3: Methodology

Introduction

In spring 2020, a Large Midwestern Community College System (LMCCS) adopted a new placement assessment called EdReady English, an online placement tool developed by The NROC Network to deliver individualized online testing and instruction to help students assess and develop their reading and writing skills. Students take an initial one-hour, multiple-choice diagnostic test to assess their critical reading and writing skills and receive a score based on their performance (EdReady, n.d.). If students meet the target score, a cut score set by their institution, they may enroll in college-level courses. If not, they are assigned to a Study Path, which contains online learning material based on the results of their diagnostic test (EdReady, n.d.). Students can raise their target score as they make progress in the Study Path by reviewing lessons, practice questions, videos, and unit tests. If a student does not wish to complete work in the Study Path, the student may opt to take a remedial integrated reading and writing course instead.

At the LMCCS, students can demonstrate college readiness in English using one of the following metrics: a high school grade point average (HSGPA), American College Test (ACT) score, Scholastic Aptitude Test (SAT) score, Preliminary Scholastic Aptitude Test (PSAT) score, a transcript that shows successful completion of college-level courses or a previous college degree, successful completion of remedial writing or reading courses, enrollment in an English co-requisite class, or a score on the Accuplacer or Accuplacer Next Generation, which was used as a placement test by the LMCCS prior to spring 2020. Students must meet statewide cut scores in both reading and writing to enroll in the first credit-bearing English course, ENGL 111: English Composition. Students who are not able to show their reading or writing competencies through any of these metrics are required to take EdReady English to determine their placement. The LMCCS has set the EdReady English target score at 70 for all its

campuses, indicating that students must score 70 or higher on their diagnostic test, which represents mastery of 70% of the content in their Study Path, to enroll in ENGL 111: English Composition. Table 1 shows a breakdown of all English placement criteria at the LMCCS.

Table 1

Large Midwestern Community College System's English Placement Criteria

	Placement Method						
	Accuplacer Next Gen	Custom Accuplacer	SAT	ACT	High School GPA	PSAT	EdReady English
Writing Scores	Writing 250-256 Writeplacer 5 and higher	Writeplacer 4-8	27 Writing and Language Test or 460 Evidence Based Reading and Writing	17 English	2.6 GPA within the last 4 years	26 Writing Skills or 430 Evidence Based Reading and Writing	Reading and Writing 70 or higher
Reading Scores	Reading 257 and higher	Reading Diagnostic 69-120	25 Reading Test or 460 Evidence Based Reading and Writing	18 Reading	2.6 GPA within the last 4 years	25 Critical Reading or 430 Evidence Based Reading and Writing	Reading and Writing 70 or higher

The LMCCS has 19 campuses, but each campus has unique student demographics, so accuracy of this placement tool could vary by campus, depending on the geographic location and student population. Therefore, it is essential to determine the accuracy of the EdReady English placement test at each campus.

Purpose Statement

Although previous studies have demonstrated that students placed by EdReady Math perform better in their first credit-bearing math courses than students placed by Accuplacer and the SAT (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; The NROC Network, 2019; Thornton et al., 2019), no extant research explores the effectiveness of EdReady English as a placement tool for first-year credit-bearing English courses. Additionally, it is unknown how accurately EdReady English places students into their first credit-bearing English course, ENGL 111, at the LMCCS. The purpose of this causal comparative quantitative study was to analyze the placement accuracy of the EdReady English placement tool utilized at one campus of the LMCCS. Specifically, this study examined students' scores on the EdReady English test and their grades in the first credit-bearing English course, ENGL 111. Additionally, this study compared the ENGL 111 grades of students placed by the EdReady English test across student subgroups to determine if there were differences in the accuracy of the test by age, race, or gender. ENGL 111 grades of students placed by EdReady English were compared to the ENGL 111 grades of students placed by other methods to analyze if students placed by EdReady English had similar success rates in the first credit-bearing English course as those placed by the Accuplacer, ACT, co-requisite, HSGPA, previous coursework or previous degree, PSAT, remedial coursework, or SAT.

Research Questions

Research Question 1 (RQ1): How accurately does the EdReady English test place students into their first credit-bearing English course, ENGL 111?

a. What is the relationship between students' scores on the EdReady English placement test and their grades in the first credit-bearing English course, ENGL 111?
b. What scores on the EdReady English placement test predict success (C or higher) in the first credit-bearing English course, ENGL 111?

Research Question 2 (RQ2): How do grades in the first credit-bearing English course, ENGL 111, vary for different student subgroups (age, race, and gender) placed using the EdReady English assessment?

Research Question 3 (RQ3): How do the ENGL 111 grades of students placed into their first credit-bearing English course by EdReady English compare to the ENGL 111 grades of students placed by other criteria (Accuplacer, ACT, co-requisite, high school GPA, previous coursework or previous degree, PSAT, remedial coursework, or SAT)?

Instrumentation

EdReady by NROC is an online tool that allows students to assess their knowledge in math, reading, and writing and receive a personalized study plan customized to their needs (EdReady, n.d.). In addition to college readiness, EdReady can be used to help students prepare for algebra, geometry, the Accuplacer, SAT, ACT, or a high school equivalency test like the GED (EdReady, n.d.). The LMCCS is using EdReady English as the placement tool for the first credit-bearing English course, ENGL 111, which is required for all majors and is a prerequisite course for dozens of other LMCCS courses. EdReady English contains 10 modules, which are called units: Introduction to College Reading and Writing, Identifying Main Ideas, Discovering Implied Meaning, Interpreting Bias, Analysis through Definition, Learning Across Disciplines, Exploring Comparative Elements, Informed Opinions through Causal Chains, Applied Critical Analysis, and Using Sources in Critical Reading and Writing (EdReady English Table of Contents, n.d.). Each unit contains three categories of study: reading, writing, and grammar. For example, Unit 1: Introduction to College Reading and Writing, contains a reading section that assesses fact and opinion, using context clues, and topic sentences. The writing portion of Unit 1 assesses topic sentences and revision, editing, and proofreading. The Unit 1 grammar section measures subjects and verbs, prepositional phrases, and end punctuation (EdReady English Table of Contents, n.d.). Appendix B contains a full list of all EdReady English topics and subtopics.

The EdReady English tool is embedded into the LMCCS student platform, so students can access it online from anywhere using their campus login information. The diagnostic test can last up to one hour and contains a variety of multiple-choice questions that students can choose to answer or pass. Each diagnostic question has a label identifying its corresponding unit, and students can see a progress bar at the top of their screen indicating how much of the test remains (EdReady, n.d.). Students have the option to save and close the test, so the test can be completed in more than one session. Once students have completed the diagnostic test, they can instantly view their score, which appears in a circle on a horizontal sliding scale from 1-100 (EdReady, n.d.). On their EdReady homepage, students will see their target score, units they need to study at the top, and units where they performed well on the bottom. The number of units will total 10, and some students will not be assigned any units to study if they demonstrated mastery on the diagnostic test.

Units are presented in the order of recommended study, but students can access any of the units in their Study Path at any order at any time (EdReady, n.d.). Each unit will appear with a color code that indicates if the topic has been mastered or needs review. When a student accesses one of their assigned units, they will see an estimated study time for that unit and individual topics in reading, writing, and grammar. Each topic will have a label, either not ready or doing well, and students can choose to learn or test over each topic. If they choose the learn option, they are directed to a lesson on the topic with text that explains the concept, examples, practice exercises, and video lessons. Students can access this material in any order, depending on how they learn best. After students review the material, they can take a test over the topic. If students show mastery of the material, the target score will increase (EdReady, n.d.). The target score is clearly visible at the top of the home page and the Study Path, so students can track their progress in real time. As soon as a student reaches a target score of 70, the EdReady platform communicates seamlessly with the LMCCS student information system, Banner,

allowing the student to enroll in ENGL 111. All lesson elements, including images and videos, are designed for accessibility according to Section 508 requirements (EdReady, n.d.).

Framework

Placement tests have been utilized since 1926 to standardize the academic requirements used for admittance to higher education (Arendale, 2011; Nettles, 2019). Over time, placement tests have become a critical tool for community colleges to assess students' readiness for college-level math and English courses (Barnett et al., 2018; Bettinger et al., 2013; Bickerstaff et al., 2016; Jimenez et al., 2016; Melguizo et al., 2014). For many years, the use of a placement test was considered a best practice for assigning students to remedial education (Hughes & Scott-Clayton, 2010). Although many institutions are moving to multiple measures placement (Bracco et al., 2014; Ganga & Mazzariello, 2019; Hodges et al., 2020), placement tests are still utilized at over half of colleges nationwide (Hodges et al., 2020). Placement tests are still the most efficient, low-cost option for many institutions, particularly large systems (Bracco et al., 2014; Hodara et al., 2012). Additionally, placement tests provide more continuity across large systems (Barnett et al., 2020), and they have objective cut scores that eliminate potential challenges to placement decisions (Bracco et al., 2014). Even colleges that utilize multiple measures include placement tests as part of the placement decision process (Barnett et al., 2020; Burdman et al., 2015; Ganga & Mazzariello, 2019; Ngo & Kwon, 2014), highlighting the important role these assessments can play in providing an appropriate placement. Even colleges that have test-optional or test-flexible policies may use placement test scores to determine appropriate course placement (Backstrom & Schultz, 2022). Most importantly, many community college students do not have access to their high school transcripts, or they have been out of high school for many years (Belfield & Crosta, 2012; Burdman et al., 2015; Daugherty et al., 2021; Woods et al., 2018). Therefore, placement tests may be the best way to assess these students' academic abilities (Scott-Clayton, 2012). Although, placement

tests are imperfect measures (Mattern et al., 2009), they provide critical insights into students' competencies that colleges can use to inform placement decisions (Allen & Radunzel, 2017; College Board, 2019; Markle & Robbins, 2013). Since procedures for validating the accuracy of placement tests are well-documented (Hughes & Scott-Clayton, 2010; Koretz et al., 2016; Melguizo et al., 2014; Sawyer, 1996; Scott-Clayton, 2012), and many institutions are still using these assessments, it is beneficial to analyze their use and effectiveness. Because EdReady English is being used as a placement test at a LMCCS, previous methods for evaluating the accuracy of placement tests were applied to the analysis of this measure.

Research Design

This quantitative study examined the final English grades of students at a campus of a LMCCS who were placed into the first credit-bearing English course, ENGL 111, by their EdReady English scores. The study utilized a causal comparative design, examining the outcomes of a variable, the EdReady English placement test, that had already occurred (Fraenkel & Wallen, 1990). Because students on this LMCCS campus were not assigned to remediation or their first credit-bearing English course randomly, this was a quasi-experimental study (Creswell & Creswell, 2018). The study analyzed students' success rates, defined as earning a C or higher, completion rates, defined as earning a D or higher, and withdrawal rates in the first credit-bearing course, ENGL 111. Previous studies on college placement test accuracy have defined course success as a B or higher in the associated first-year course in math or English (Allen & Radunzel, 2015; Hughes & Scott-Clayton, 2010); however, a grade of C or higher will transfer successfully to the four-year public universities associated with this LMCCS. Therefore, a C or higher was considered a success in this study.

First, the ENGL 111 grades of students placed by EdReady English were examined. Sawyer (1996) argued that an accurate placement measure will correlate positively with grades, such that students

scoring higher on the placement test will earn higher grades. Additionally, to examine the relationship of EdReady English scores and grades in the first credit-bearing English course, a regression was run to determine what EdReady English scores predicted success in ENGL 111. Next, the grades in the first credit-bearing English course earned by students who were placed using the EdReady English assessment were examined by subgroups: age, race, and gender. Previous studies have determined that placement tests can create different student outcomes by race (Brathwaite & Edgecombe, 2018; Klasik & Strayhorn, 2018; Nettles, 2019; Ngo & Kwon, 2014; Park et al., 2018; Stich, 2021; Zwick & Sklar, 2005); therefore, it was essential to determine if the accuracy of the EdReady English placement test varied by student subgroup. Because a threat to causal-comparative studies is inherent differences in groups (Fraenkel & Wallen, 1990), the medians of each placement group were calculated, and visual inspections of boxplots were used to ensure groups were equivalent before comparison. Finally, the ENGL 111 grades of students placed by the EdReady English assessment were compared to those of students placed using other methods (Accuplacer, ACT, co-requisite, HSGPA, previous coursework or previous degree, PSAT, remedial coursework, or SAT). These outcomes were analyzed to determine if students placed by the EdReady English assessment had similar English grades as those placed by other methods. Specifically, since other studies have found that HSGPA is highly correlated to college success (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Bahr et al., 2019; Geiser et al., 2007; Koretz et al., 2016), it was critical to determine if students placed using the EdReady English assessment were experiencing the same outcomes as those placed by HSGPA.

Participants

Secondary data was collected from students at a selected campus of the LMCCS that is categorized as urban (National Center for Education Statistics, 2006). The study included all students who took the first credit-bearing English course, ENGL 111, from August 2020 until March 2022. The

population of the LMCCS is 70% White with smaller populations of Black, Hispanic, and multiracial individuals. Over half the population of LMCCS is female, and the majority are part-time students. This LMCCS campus was selected because it was one of the first in the LMCCS to adopt the EdReady assessment tool. Because this campus was chosen for its longevity with the EdReady placement assessment, the sampling method for this study was purposive (Lavrakas, 2008).

The initial sample contained 1,014 student scores, but five students were removed because their placement method could not be determined. This is because professionals in the admissions office must enter how the student was placed into ENGL 111 manually, and no placement method was recorded for these five students. One of the five students took ENGL 111 twice, so six scores were removed in total. Four more student scores were removed because they represented students who took an earlier version of EdReady that contained a separate reading and writing test. Because these students took two tests instead of the combined reading and writing test that most students in the sample took, they were removed from the data set. 54 students took ENGL 111 more than once in the period of data collection. Students' first grade in ENGL 111 was retained, and grades in subsequent attempts at ENGL 111 were discarded. This is because students' first attempt at ENGL 111 is more reflective of the accuracy of the placement method than second or third attempts, after which students' performance also reflects knowledge gained by completing part or all of the course. Because one student took ENGL 111 three times in the study period, 55 scores were removed due to students repeating the course. This left 948 individual students in the study.

Data Collection

The data for this study was obtained through a formal request to the data strategist of the LMCCS, who provided secondary data of students' placement methods, demographic data, and their scores and completions in the first credit-bearing English course, ENGL 111. The LMCCS data strategist

pulled the data from the college's student information system, Banner, which houses students' placement and demographic data. Banner contains data from students' registration information, transcript information, class registration, and financial aid status. The data analyst compiled the requested data, which included students' identification number, race, age, gender, English placement method, and grade in ENGL 111, and shared it with the primary researcher using a spreadsheet. The data was de-identified by removing students' identification numbers and replacing them with participant numbers. The data for this study was collected from August 2020 until March 2022. The campus selected for this study has two eight-week periods each fall and spring semester and one eight-week semester in the summer. Therefore, the data in this study represents eight completed course periods: two eight-week periods in Fall 2020, two eight-week periods in Spring 2021, one summer period in 2021, two eight-week periods in Fall 2021, and the first eight-week period in Spring 2022.

Data Analysis

This study used IBM SPSS v. 28 to analyze the English grades of students placed by the EdReady English assessment to determine how accurately the test identified students who are considered college ready for the first credit-bearing English course, ENGL 111.

Research Question 1 (RQ1): How accurately does the EdReady English test place students into their first credit-bearing English course, ENGL 111?

a. What is the relationship between students' scores on the EdReady English placement test and their grades in the first credit-bearing English course, ENGL 111?

   $H1_0$: The coefficient of the slope equals zero.

   H1: The coefficient of the slope does not equal zero.

b. What scores on the EdReady English placement test predict success (C or higher) in the first credit-bearing English course, ENGL 111?

To test Research Question 1a, a linear regression was run using the score on the EdReady English placement test as the independent variable and the grade in the first credit-bearing English course as the dependent variable. This is the test used in previous placement accuracy studies (Barnett et al., 2018; Belfield & Crosta, 2012; Bettinger & Long, 2005; Geiser et al., 2007; Koretz et al., 2016; Ngo & Kwon, 2014; Scott-Clayton, 2012), but there are no applications of this test using the EdReady English assessment in the extant research. Linear regression was selected over logistic regression used in past studies (Medhanie et al., 2012; Whiton et al., 2018) because it is important to examine each grade outcome instead of a binary pass/no pass outcome. This created a broader picture of how students' grades are associated with specific EdReady English scores. Examining the accuracy of EdReady English involves analyzing the use of the test, not the test itself (American Educational Research Association et al., 2014). Grades were converted to numbers, where A was assigned 4, B was assigned 3, C was assigned 2, D was assigned 1, and F, FW (indicating the student stopped attending the class without formally withdrawing), and withdrawals were assigned 0 (Armstrong, 1999; Behrman & Street, 2005). A scatterplot was created to determine if there was a relationship between EdReady English scores and ENGL 111 grades and if that relationship was linear. The regression indicated how much of the variation in the dependent variable, the ENGL 111 course grade, was determined by the independent variable, the score on the EdReady English placement test. The R-squared value was used to determine the amount of variance in the ENGL 111 grade that was explained by the EdReady English placement score. The *p* value reported by the ANOVA results was used to indicate if the regression model was significant ($p<.05$).

The College Board (2019) noted that the predictive validity of a placement assessment indicates how well it serves its purpose. Therefore, it was necessary to test how well the EdReady English score predicted the grade in ENGL 111. To test Research Question 1b, a linear regression was run to test the

relationship between the predictor variable, EdReady English score, and the criterion variable, successful completion of ENGL 111, defined as a C or higher. The p value reported by the ANOVA results was used to indicate if the regression model was significant (p<.05). The R-squared value was used to determine what percentage of variability in the ENGL 111 grade could be explained by the EdReady English score. Effects were measured using Cohen's (1988) criteria whereby 10% is a small effect, 30% is medium, and 50% is a large effect.

Research Question 2 (RQ2): How do grades in the first credit-bearing English course, ENGL 111, vary for different student subgroups (age, race, and gender) placed using the EdReady English assessment?

$H2_0$: There are no differences in the medians of students' ENGL 111 grades by age.

H2: There are differences in the medians of students' ENGL 111 grades by age.

To examine age, the first subgroup for RQ2, a Kruskal-Wallis H test was run because normal assumptions were not met. First, all the students in the study who were placed into the first credit-bearing English course, ENGL 111, using the EdReady English test were selected. The independent variable was age, and the dependent variable was the grade in ENGL 111. Age was entered as a categorical variable, using age categories 14-19, 20-24, 25-31, and 32 and up. Grades were converted to numbers, where A was assigned 4, B was assigned 3, C was assigned 2, D was assigned 1, and F, FW, and withdrawals were assigned 0 (Armstrong, 1999; Behrman & Street, 2005). A Kruskal-Wallis H test was used to determine if there were statistically significant differences in the medians of the groups, which was determined by a p-value less than .05. A post hoc test was used to determine where statistically significant differences among the groups existed.

$H3_0$: There are no differences in the medians of students' ENGL 111 grades by race.

H3: There are differences in the medians of students' ENGL 111 grades by race.

Previous studies have identified differences in student outcomes on placement tests by race (Atkinson & Geiser, 2009; Geiser et al., 2007; Klasik & Strayhorn, 2018; Nettles, 2019), finding that placement tests tend to underpredict the abilities of minority students. To examine differences by race, the second subgroup of RQ2, a Kruskal-Wallis H test was run because normal assumptions were not met. First, students in the study who were placed into the first credit-bearing English course, ENGL 111, using the EdReady English test were selected. The independent variable was race, and the dependent variable was the grade in ENGL 111. The categorical variables, as determined by the demographics of the LMCCS, were Black or African American, White, two or more races, Hispanic or Latino, and Asian. Grades were converted to numbers, where A was assigned 4, B was assigned 3, C was assigned 2, D was assigned 1, and F, FW, and withdrawals were assigned 0 (Armstrong, 1999; Behrman & Street, 2005). A Kruskal-Wallis H test was used to determine if there were statistically significant differences ($p<.05$) among the medians of the racial groups.

$H4_0$: There are no differences in the medians of students' ENGL 111 grades by gender.

H4: There are differences in the medians of students' ENGL 111 grades by gender.

An independent t-test was used to examine the third subgroup identified in RQ2, gender. The LMCCS collects data on only two genders, male and female, so only these two groups were analyzed in the study. The independent variable was gender, and the dependent variable was the grade in ENGL 111, which was converted to numbers such that A was assigned 4, B was assigned 3, C was assigned 2, D was assigned 1, and F, FW, and withdrawals were assigned 0. An independent t-test was run to determine if there was a statistically significant difference ($p<.05$) in the means of the two groups. Although normally distributed data is not a required assumption for a t-test (Ruth, 2011), a Mann Whitney-U test was also run to verify the results of the t-test since the data was not normally distributed.

Research Question 3 (RQ3): How do the ENGL 111 grades of students placed into their first credit-bearing English course by EdReady English compare to the ENGL 111 grades of students placed by other criteria (Accuplacer, ACT, co-requisite, high school GPA, previous coursework or previous degree, PSAT, remedial coursework, or SAT)?

$H5_0$: There are no differences in the medians of students' ENGL 111 grades by placement criteria.

H5: There are differences in the medians of students' ENGL 111 grades by placement criteria.

An NROC case study of Jacksonville State University found that students who tested into their first credit-level math course using EdReady Math had higher pass rates than students who were placed using the COMPASS or SAT/ACT scores (The NROC Network, 2019). To test RQ3, a Kruskal-Wallis H test was run because normal assumptions were not met. The placement method was used as the independent variable and the grade in ENGL 111 was the dependent variable. Grades were converted to numbers, where A was assigned 4, B was assigned 3, C was assigned 2, D was assigned 1, and F, FW, and withdrawals were assigned 0 (Armstrong, 1999; Behrman & Street, 2005). Statistical significance was set at $p<.05$, and a post hoc test was run to determine the location of differences among the medians of the placement groups.

Significance of the Study

Because many students must take the EdReady English placement test before enrolling in the first credit-bearing English course, which is required for all majors and is a prerequisite for many courses at the LMCCS, this assessment serves as a gateway to college enrollment. Therefore, it is essential that this metric accurately identifies students who will be successful in their first credit-bearing English course. The placement metric being used to assign students to the first credit-bearing English course

must be not only accurate, but consistently accurate across different student subgroups. This study will further the understanding of how EdReady operates at a community college and how accurately it places students into their first credit-bearing English course. This will generate data that may help college leaders determine whether EdReady English is an accurate tool for placement, which could improve placement at this campus and others in the LMCCS. The examination of the EdReady English scores that predict success in ENGL 111 may also help the LMCCS and other colleges determine appropriate cut scores for this assessment. The analysis of the grade outcomes of students placed by EdReady English compared to those placed by other methods may allow policymakers and advisors to gauge the effectiveness of EdReady or prioritize it alongside other methods. Finally, the exploration of how accurately EdReady placed students of various subgroups into their first credit-bearing English class may help college leaders and advisors determine whether EdReady English is an appropriate measure for their student populations.

Delimitations

Because accuracy rates are often higher for math placement tests than English tests (Belfield & Crosta, 2012; Hughes et al., 2010, James, 2006; Mattern et al., 2009; Scott-Clayton, 2012; Scott-Clayton et al., 2014), only the EdReady English placement test was selected for the study. Although dual-credit students take the EdReady English placement test at the LMCCS, they were not included in this study because these students complete their credit-bearing English course in high school, not at the local campus of the LMCCS. Because the LMCCS has several campuses in locations around the state, one campus was selected for analysis to avoid conflating the results of different campuses, specifically because the geographic locations and student demographics vary by campus.

Limitations

The LMCCS started using EdReady English as a placement tool in March 2020 and began collecting data on student scores and outcomes in Fall 2020. Therefore, time was a limitation for this study since long-term outcomes for students are unknown. This study analyzed the placement accuracy of the EdReady English placement test at one campus of the LMCCS; therefore, it reflected the specific demographics and context of the campus. Additionally, because EdReady provides a Study Path, students may retest on some topics or units multiple times. Because it was not possible to differentiate between a student who reached the target score on the first attempt and a student who spent several days working to raise the score, all students who reached the target score (70) were included in one group, those who reached the cut score set by the institution.

Assumptions

It is assumed that students who tested into the first credit-bearing English course using the EdReady English placement tool did so because they did not or could not demonstrate college readiness using alternative metrics, such as Accuplacer, ACT, co-requisite, HSGPA, previous coursework or previous degree, PSAT, remedial coursework, or SAT.

Chapter 4: Findings

Introduction

The purpose of this causal comparative quantitative study was to analyze the accuracy of the EdReady English placement tool utilized at one campus of a Large Midwestern Community College. This study examined students' scores on the EdReady English test and their grades in the first credit-bearing English course, ENGL 111. The ENGL 111 grades of students placed by the EdReady English tool were compared across student subgroups to determine if there were differences in the grade outcomes of the test by age, race, or gender. Finally, ENGL 111 grades of students placed by EdReady English were compared to the ENGL 111 grades of students placed by other methods to determine if students placed by EdReady English had similar success rates in ENGL 111 as students placed by other placement methods.

Descriptive Statistics

The data for this study was collected from August 2020 until March 2022. The sample contained 938 unduplicated students with an average age of 24.18. The youngest student in the study was 14, and the oldest student was 59. The average age in the sample is representative of the population at the selected campus of the LMCCS. In Fall 2021, the most recent year for which statistics were available, 67.3% of students at the campus were younger than 30, and the largest group was between 25-29 years old, making up 18.4% of the total campus population. Table 2 shows the mean age of all students in the study by placement method. Students who placed into ENGL 111 by PSAT were the youngest in the study (*m*=18.07), followed by SAT (*m*=18.62) and ACT (*m*=18.83). The oldest students in the study were placed into ENGL 111 using a previous degree (*m*=32.16) or previous coursework (*m*=26.13).

Table 2

Mean Age of Students Who Took ENGL 111 by Placement Method (Fall 2020-Spring 2022)

Placement Methods	Mean Age
Accuplacer	23.29
ACT	18.83
Co-requisite	22.00
EdReady English	24.18
HSGPA	18.94
Previous Coursework	26.13
Previous Degree	32.16
PSAT	18.07
Remedial Coursework	25.1
SAT	18.62

The racial composition of the study, represented in Table 3, was also similar to the general campus population. The most commonly reported race was White (*n*=753), and the second most commonly reported race was Black or African American (*n*=94). White students comprise 79.43% of the students in the sample, and Black or African American students make up 9.91% of the sample. This sample mirrors the campus population, which had a population that was 73.6% White in Fall 2021. There are slightly more White students in the sample than in the general campus population. There are also more Black students in the study than in the general campus population, which had 7.6% of students who identified as Black or African American in Fall 2021. The number of students who reported belonging to two or more races was higher in the sample, 5.7%, than in the general population of the campus, which had only 3.7% of students who identified as two or more races in Fall 2021. There were fewer students in the sample listed as unknown or not reported, 1.7%, than in the campus demographics, which were 12.3%. The smallest groups represented in the sample were American Indian or Alaska Native (*n*=2) and Native Hawaiian or Other Pacific (*n*=2). These two racial categories, along

with Asian and Hispanic/Latino were identical or nearly identical to the campus population in Fall 2021, which was less than 1%.

Table 3

Racial Categories of All Students Who Were Placed into ENGL 111 (Fall 2020-Spring 2022)

Race/Ethnicity	Number of Students	Percentage
White	753	79%
Black or African American	94	10%
Two or More Races	54	6%
Unknown/Not Reported	16	2%
Hispanic/Latino	15	2%
Asian	12	1%
American Indian or Alaska Native	2	<1%
Native Hawaiian or Other Pacific Islander	2	<1%
Total	948	100%

At the time of data collection, the LMCCS only provided two categories for gender: male or female. 66.24% of students in the sample identified as female (*n*=628), and 33% identified as male (*n*=313). 7 students in the sample, 1%, did not report a specific gender. The sample had a higher percentage of students who identified as female than the general campus population, which was 47.6% female, 49.8% male, and 2.6% not reported in Fall 2021. Therefore, the sample is not representative of the campus demographics in terms of gender. The campus population is more evenly distributed than the statewide population of the LMCCS, which was 55.8% female, 42.8% male, and 1.5% not reported in Fall 2021.

There were 10 different methods used to place students in the study into ENGL 111. Table 4 indicates the number of students placed by each method. The EdReady English test was the most common placement method (*n*=500), followed by high school GPA (*n*=201). The next most common placement method was previous coursework (*n*= 81). This delineation indicates that a student has demonstrated reading and writing competency by completing college-level coursework at another

institution without earning a degree. The least common placement methods were the co-requisite model (*n*= 10), in which students are placed concurrently into a remedial English course designed to support their progress in ENGL 111, and remedial coursework (*n*=10), which indicates a student completed one or more remedial courses with a C or higher.

Table 4

All Student Placement Methods for ENGL 111 (Fall 2020-Spring 2022)

Placement method	Number of Students	Percentage
EdReady English	500	53%
HSGPA	201	21%
Previous Coursework	79	8%
SAT	66	7%
PSAT	27	3%
Accuplacer	24	3%
Previous Degree	19	2%
ACT	12	1%
Co-Requisite Course	10	1%
Remedial Course	10	1%
Total	948	100%

The ENGL 111 grades of all students in the study are shown in Table 5. 62.23% of students in the study (*n*=590) earned a C or higher in ENGL 111. The least common grade was a D (*n*=31), and 34.5% of students (*n*=327) did not earn a credit in the class because of an F, FW, or withdrawal. An FW indicates a student stopped attending class but did not drop, and a W indicates a student withdrew from the class after the 100% refund period where drops are not recorded on a student's official transcript. The grades in the sample are lower than the statewide pass rates for ENGL 111 at the LMCCS. In 2020 and 2021, 78% of students at the LMCCS passed ENGL 111 with a C or higher.

Table 5

Grade Distributions for All Students Enrolled in ENGL 111 Fall 2020-Spring 2022

ENGL 111 Grade	Number of Students	Percentage
A	292	31%
B	186	20%
C	112	12%
D	31	3%
F	67	7%
FW	168	18%
W	92	10%
Total	948	100%

The number of students who were placed into ENGL 111 using EdReady English comprised over half (*n*=500) of the sample. The demographics of these students, which are visible in Table 6, differed from those of students who were placed using other methods. However, the average age of students who placed into ENGL 111 using EdReady English was identical to that of the larger sample, *m*=24.18.

Table 6

Demographics of Students Who Were Placed into ENGL 111 Using EdReady English (2020-2022)

Demographic	Category	Number of Students	Percentage
Race	White	392	78%
	Black or African American	61	12%
	Two or More Races	23	5%
	Hispanic/Latino	8	2%
	Unknown/Not Reported	7	1%
	Asian	6	1%
	American Indian or Alaska Native	2	<1%
	Native Hawaiian or Other Pacific Islander	1	<1%
	Total	500	100%
Gender	Female	331	66%
	Male	165	33%
	Blank or Not Reported	4	1%
	Total	500	100%

To understand the unique demographics of students placed by EdReady English, it is important to compare them to those placed by all other methods. This data is represented in Table 7. The group of

students who were placed using all other methods except EdReady English is slightly younger (*m*=21.10) than the group of students placed by EdReady English (*m*=24.18). The gender composition of students who placed into ENGL 111 by all other methods is identical to the group of students who placed using EdReady English. The group of students who placed using all other methods had a higher percentage of White students, 81%, than the group of students who placed using EdReady English, which was 78% White. The student population that placed into ENGL 111 through EdReady English was 12% Black or African American, but the group who placed using all other methods was only 7% Black or African American. The group comprising all placement methods except EdReady English had a slightly higher percentage of students who identified as two or more races, 7%, than the EdReady English group, which had only 5%. Both placement groups had nearly identical percentages of all other racial groups except American Indian/Alaska Native. There were no students of this racial group represented in the population that comprised all placement methods except EdReady English. However, the EdReady placement group contained two students who identified as American Indian or Alaska Native.

Table 7

Students Who Placed into ENGL 111 (2020-2022) through All Methods Except EdReady English

Demographic	Category	Number of Students	Percentage
Race	White	361	81%
	Black of African American	33	7%
	Two or More Races	31	7%
	Unknown/Not Reported	9	2%
	Hispanic/Latino	7	2%
	Asian	6	1%
	Native Hawaiian or Other Pacific Islander	1	<1%
	American Indian or Alaska Native	0	0%
	Total	448	100%
Gender	Female	297	66%
	Male	148	33%
	Blank or Not Reported	3	1%
	Total	448	100%

Not only was the demographic data of students placed by other methods different from the group of students placed by EdReady English, but there were also differences in the grades students earned in ENGL 111, which are represented in Table 8. Students who were placed by all other methods had a higher percentage of As (34%) and Bs (21)% than the group of students placed by EdReady English, which had 28% of students who earned As and 18% who earned Bs. 14% of the students placed by all other methods earned Cs compared to the EdReady English group, where only 10% of students earned Cs. Together, all other placement methods had a 69% success rate, as defined by a C or higher in the class. Students in the EdReady English group, by contrast, had a 56% success rate. Although the percentage of students earning a D or F in ENGL 111 was similar in both groups, a fewer number of students who were placed by all other methods earned an FW, the grade assigned for students who stopped attending class but did not withdraw. In the group placed by all other methods, 13% of students earned an FW. In the group of students placed by EdReady English, 22% of students earned an FW. The withdrawal rate in the EdReady English group was higher, 12%, than the rate of those placed by all other methods, which was only 8%.

Table 8

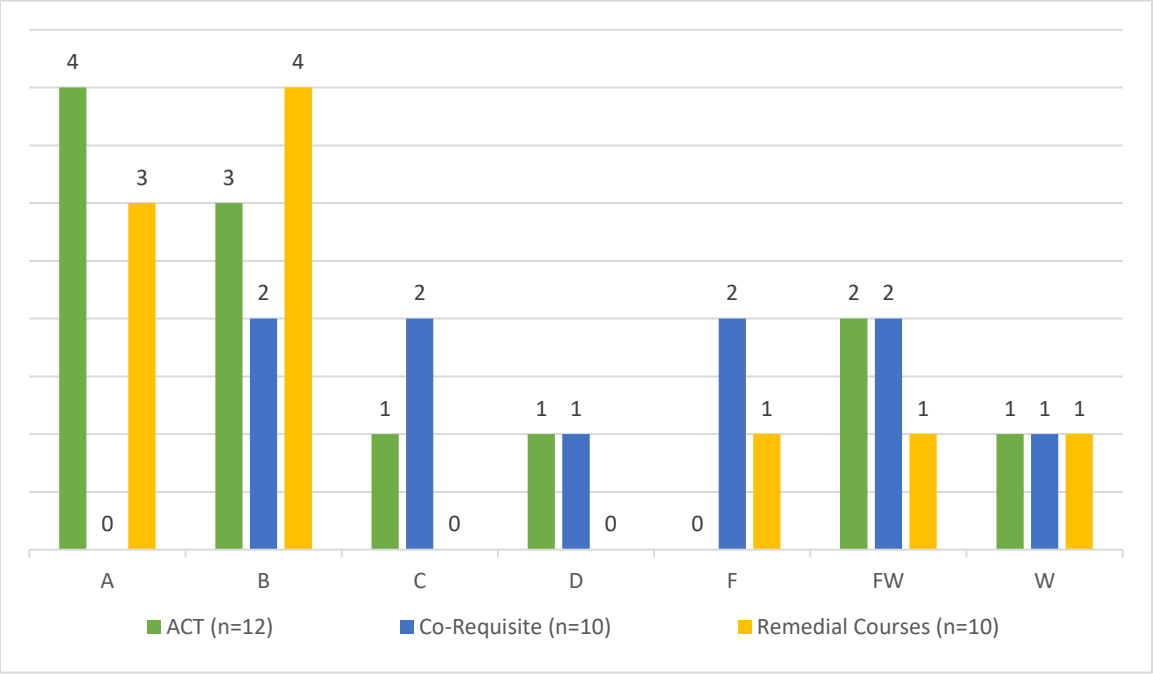
Grade Distribution of Students Placed into ENGL 111 by EdReady English Vs Students Placed into ENGL 111 By All Other Methods (2020-2022)

Grade	EdReady English	Percentage	All Other Placement Methods	Percentage
A	140	28%	152	34%
B	92	18%	94	21%
C	49	10%	63	14%
D	14	3%	17	4%
F	39	8%	28	6%
FW	108	22%	60	13%
W	58	12%	34	8%
Total	500	100	448	100%

For a closer analysis of student placement data, Figures 1-4 compare ENGL 111 grade distribution of students placed by various methods. Groups of comparable size are depicted side by side to demonstrate how placement groups with similar numbers of students fared in ENGL 111. Figure 1 depicts placement groups with 12 or fewer students: ACT (*n*=12), co-requisite (*n*=10), and remedial coursework (*n*=10). In this smaller group, students placed by the ACT had the highest number of As in ENGL 111, but students from all three groups had similar failure rates.

Figure 1

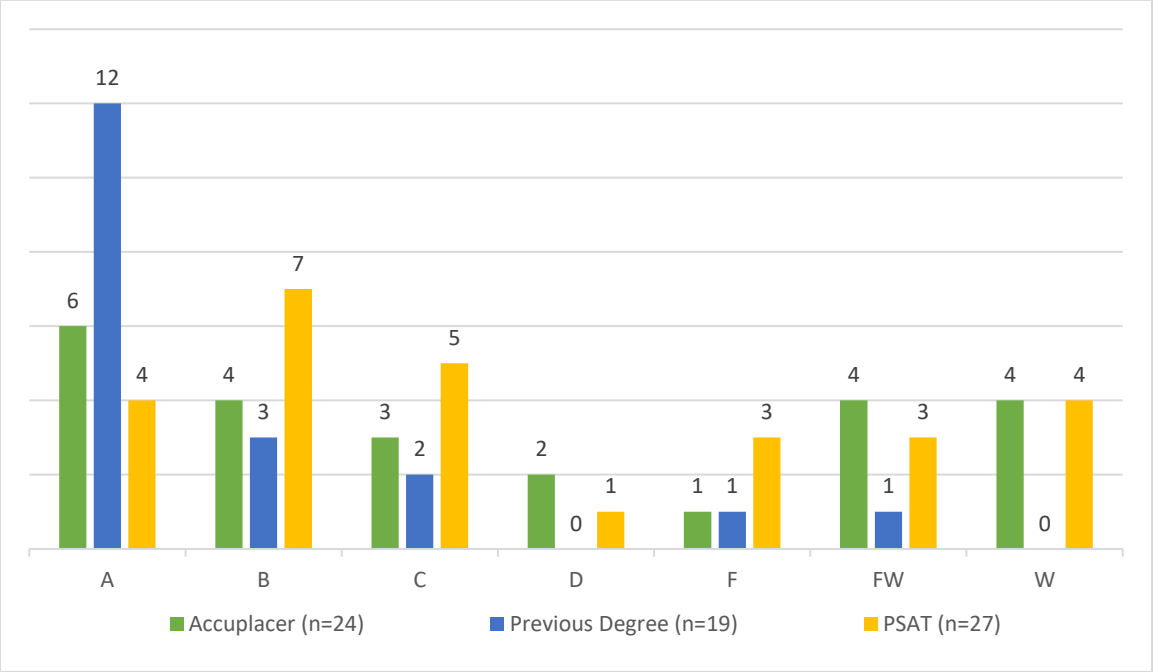
Grade Distribution for Students Placed into ENGL 111 by ACT, Co-Requisite, and Remedial Courses



In Figure 2, groups with between 19-27 students were compared, which included students placed by Accuplacer or Accuplacer NextGEN (*n*=24), previous degree (*n*=19), or PSAT (*n*=27). Among this group, students placed by previous degree had the highest number of As in ENGL 111 (*n*=12). Students placed by previous degree had no Ds or withdrawals, and the lowest numbers of Fs (*n*=1) and FWs (*n*=1) in the comparison group.

Figure 2:

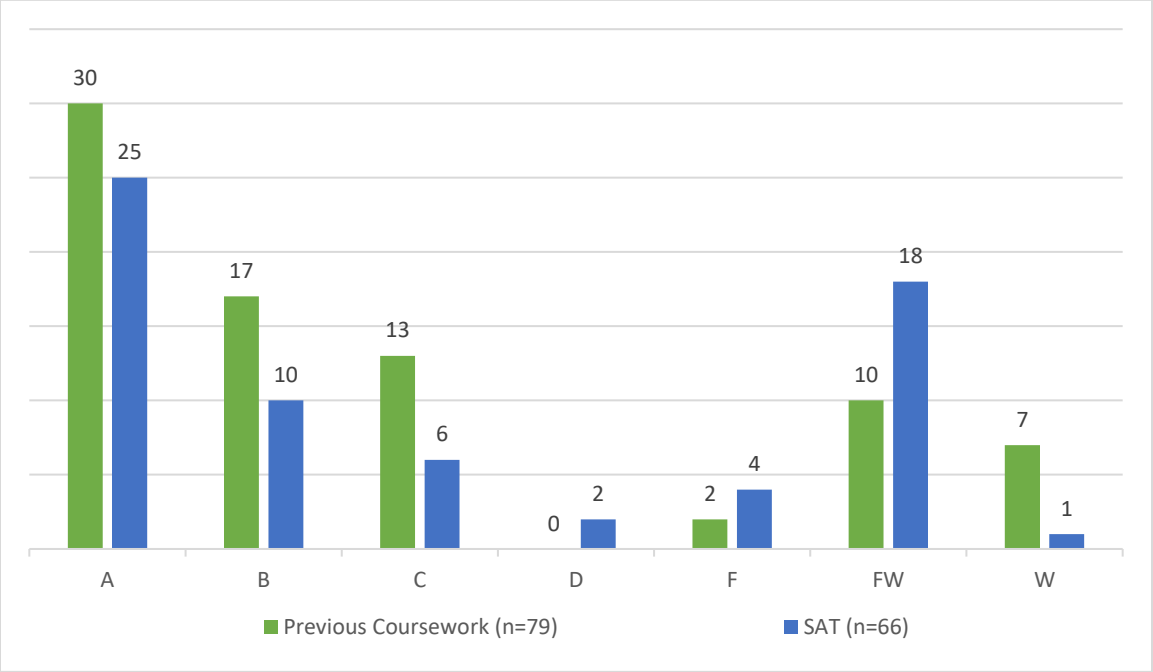
Grade Distribution for Students Placed into ENGL 111 by Accuplacer, Previous Degree, and PSAT



The second largest groups were students placed by the SAT (*n*=66) and previous coursework (*n*=79). This comparison is depicted in Figure 3, which shows that students placed into ENGL 111 by previous coursework had more successful completions, defined as a C or higher, than students who placed using SAT scores. The group of students placed by the SAT had more students who earned an F or FW than those placed by previous coursework, but students placed by previous coursework had more course withdrawals (*n*=7) compared to those who placed using the SAT (*n*=1).

Figure 3

Grade Distribution for Students Placed into ENGL 111 by SAT and Previous Coursework



The largest groups in the study were placed into ENGL 111 by HSGPA (*n*=201) and EdReady English (*n*=500). Figure 4 reveals that students placed by EdReady English had greater numbers of students successfully completing ENGL 111 with a C or higher. Since the EdReady English group is much larger than the group placed by HSGPA, the number of students earning each grade is not as revealing for these two groups as in the previous three comparisons. Therefore, the percentage of students earning each grade is depicted in Table 9.

Figure 4

Grade Distribution for Students Placed into ENGL 111 by High School GPA and EdReady English

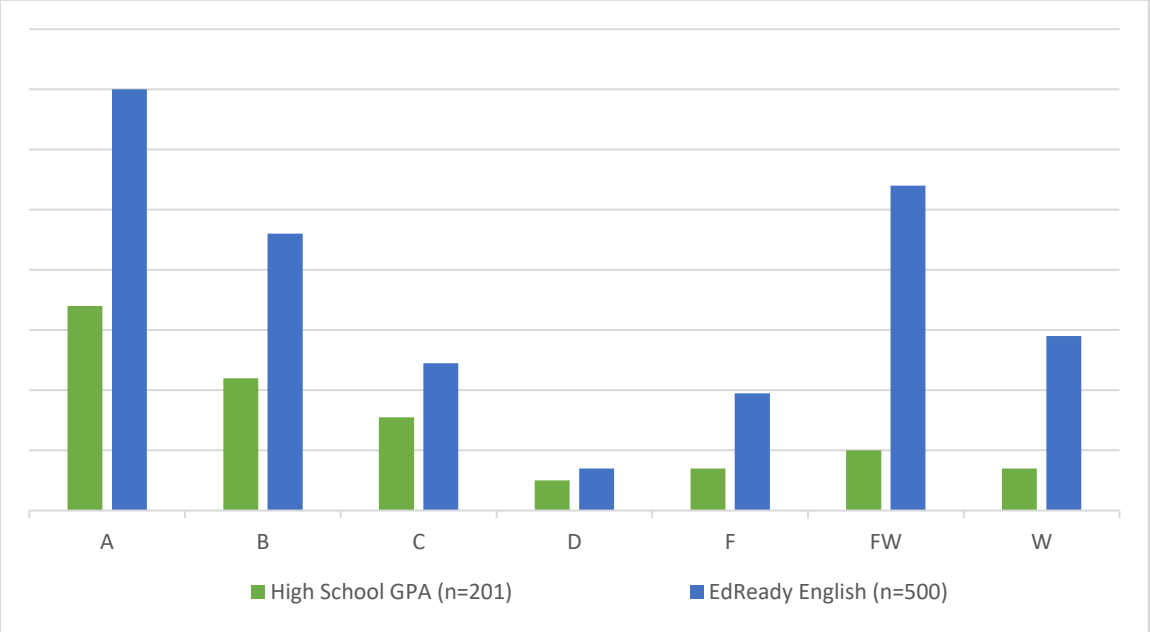


Table 9 illuminates the percentage of students earning every grade in each group. This allows comparison among groups of varying sizes. The group with the highest percentage of As among all placement groups was placed by previous degree; 63% of these students earned an A in ENGL 111. Students who placed using previous coursework or the SAT had the second-highest grades, but they were significantly lower than those placed by previous degree. 38% of students placed by previous coursework or ACT earned an A. The percentage of students earning a B in ENGL 111 was fairly consistent across placement groups with somewhere between 15- 22% of students earning a B. Students who placed by ACT and PSAT had a slightly higher percentage of Bs, which were 25% and 26%, respectively. Students placed by co-requisite had the highest percentage of students earning a B, 40%, but it is important to note that this percentage represents only two students.

Table 9

Grade Distribution for Students Placed into ENGL 111 by All Methods (2020-2022)

Placement Method	Grades						
	A	B	C	D	F	FW	W
Accuplacer or Accuplacer Next Gen	25%	17%	12%	8%	4%	17%	17%
ACT	33%	25%	8%	8%	0%	17%	8%
Co-Requisite	0%	20%	20%	10%	20%	20%	10%
EdReady English	28%	18%	10%	3%	8%	22%	12%
High School GPA	34%	22%	15%	5%	7%	10%	7%
Previous Coursework	38%	22%	16%	3%	13%	9%	9%
Previous Degree	63%	16%	11%	0%	5%	5%	0%
PSAT	15%	26%	19%	4%	11%	11%	15%
Remedial Courses	30%	40%	0%	0%	10%	10%	10%
SAT	38%	15%	9%	3%	6%	27%	2%

A deeper exploration of success rates can be found in Table 10, which breaks down the percentage of students in each group earning a C or higher. Students who were placed using a previous degree had the highest success rate, 89.47%, followed by students who were placed using previous coursework, who had a success rate of 75.95%. The group with the lowest success rate was placed into ENGL 111 by the co-requisite model. Only 40% of these students passed ENG 111 with a C or higher. Students who were placed into ENGL 111 by Accuplacer had the second lowest success rate; only 54.17% of students from this group earned a C or higher.

All groups had low percentages of students earning a D in ENGL 111. Students placed using the co-requisite model had the highest percentage of Ds, 10.0%, followed by students placed by the Accuplacer and ACT, both with just 8.33% of their students earning Ds. No students placed by a remedial course or previous degree earned a D in ENGL 111 during the time in which data was collected, and only 2.53% of students placed by previous coursework earned a D.

The placement group with the highest percentage of failures was the co-requisite model, with 50.0% of students in this group earning a failing grade. Students who were placed by EdReady English had the second-highest failure rate; 41.0% of students using this method did not pass ENGL 111. Conversely, students placed by previous degree had the lowest percentage of failure, 10.53%. The next lowest failure rates were students who were placed using previous coursework; only 21.52% of these students failed ENGL 111. Students who were placed using HSGPA had a similar failure rate; just 23.88% of students from this group failed ENGL 111.

Table 10

Percentage of Successful Completions (C or Higher), Ds, and Failures (F, FW, or W) for all ENGL 111 Placement Methods (2020-2022)

Placement Method	Successful Completions	Ds	Failures	Total
Accuplacer	54.17%	8.33%	37.5%	100%
ACT	66.67%	8.33%	25.0%	100%
Co-requisite	40.00%	10.0%	50.0%	100%
EdReady English	56.2%	2.8%	41.0%	100%
HSGPA	71.14%	4.98%	23.88%	100%
Previous Coursework	75.95%	2.53%	21.52%	100%
Previous Degree	89.47%	0.0%	10.53%	100%
PSAT	59.26%	3.7%	37.04%	100%
Remedial Coursework	70.00%	0.0%	30.00%	100%
SAT	62.12%	3.03%	34.85%	100%

Withdrawals are included in the failure rates for Table 10, but it is useful to consider these rates separately since students who withdrew did not complete the class. This data can be found in Table 11, which shows the percentage of students who withdrew from ENGL 111 by each placement method. The statewide withdrawal rate for ENGL 111 in Fall 2021 was 4.37%, so all but two placement categories, SAT and previous degree, were above the statewide benchmark for withdrawals. Students who were placed into ENGL 111 using Accuplacer had the highest withdrawal rate, 16.67%. The second-highest group was students placed by the PSAT; 14.81% of these students withdrew from ENGL 111. Students placed by previous degree had no withdrawals. Students placed by the SAT had the lowest withdrawal rates, 1.51%. The next lowest group was students placed by HSGPA; just 6.97% of these students withdrew from ENGL 111.

Table 11

ENGL 111 Withdrawal Rates for all Placement Methods (2020-2022)

Placement Methods	Ws
Accuplacer	16.67%
ACT	8.33%
Co-requisite	10.00%
EdReady English	11.60%
HSGPA	6.97%
Previous Coursework	8.86%
Previous Degree	0.00%
PSAT	14.81%
Remedial Coursework	10.00%
SAT	1.51%

Findings

The current study explored three research questions.

Research Question 1: How accurately does the EdReady English test place students into their first credit-bearing English course, ENGL 111?

Research Question 1a (RQ1a): What is the relationship between students' scores on the EdReady English placement test and their grades in the first credit-bearing English course, ENGL 111?

$H1_0$: There is no statistically significant relationship between the predictor variable, the EdReady English score, and the grade in ENGL 111.

H1: There is a statistically significant relationship between the predictor variable, the EdReady English score, and the grade in ENGL 111.

There were 500 EdReady English scores in the sample (*M*=72.25, *SD*=5.89). The majority of the scores earned by students who were placed by EdReady English were 70 (*n*=275) or 71 (*n*=114). The cumulative percentage of both scores is 77.8%, indicating that these two scores accounted for most of the scores in the data set. Since a score of 70 is required for students to take ENGL 111, there are no scores in the sample below the cut score. EdReady English score frequencies are depicted in Table 12.

Table 12

Frequency of EdReady English Scores among Students Placed into ENGL 111 (2020-2022)

EdReady Score	Frequency	Percent	Valid Percent	Cumulative Percent
70	275	55.0	55.0	55.0
71	114	22.8	22.8	77.8
72	36	7.2	7.2	85.0
73	19	3.8	3.8	88.8
74	8	1.6	1.6	90.4
75	2	.4	.4	90.8
76	3	.6	.6	91.4
77	5	1.0	1.0	92.4
78	3	.6	.6	93.0
79	1	.2	.2	93.2
80	1	.2	.2	93.4
81	1	.2	.2	93.6
82	4	.8	.8	94.4
83	1	.2	.2	94.6
84	1	.2	.2	94.8

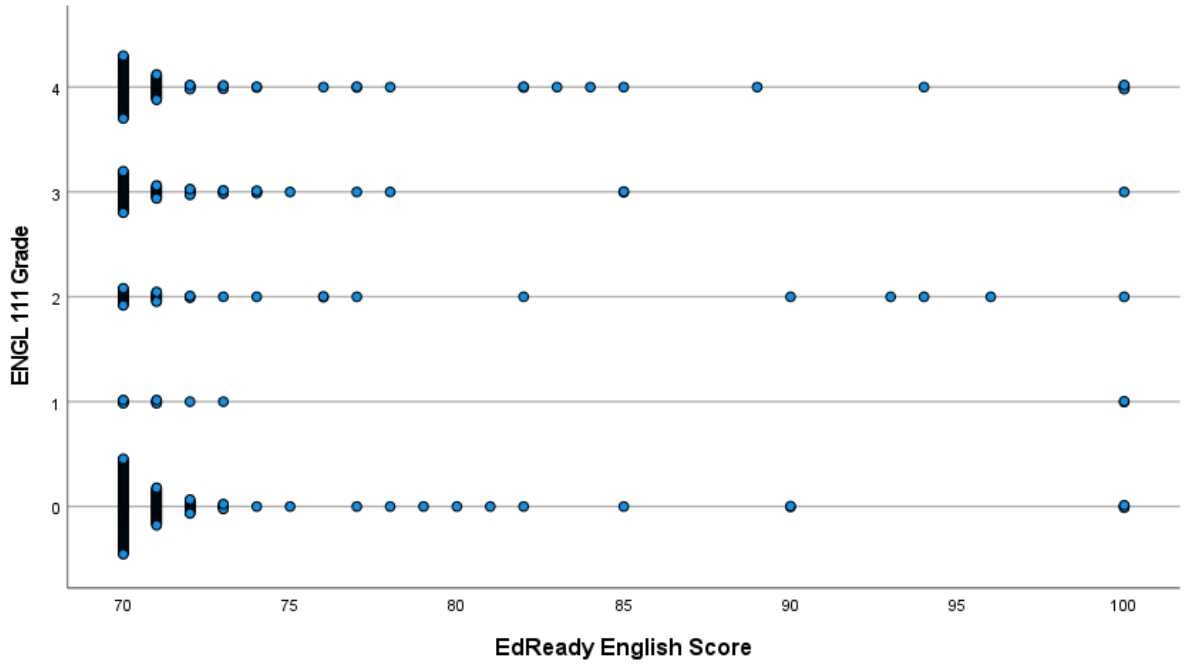
EdReady Score	Frequency	Percent	Valid Percent	Cumulative Percent
85	4	.8	.8	95.6
89	1	.2	.2	95.8
90	3	.6	.6	96.4
93	1	.2	.2	96.6
94	2	.4	.4	97.0
96	1	.2	.2	97.2
100	14	2.8	2.8	100.0
Total	500	100.0	100.0	

To test if a linear relationship existed between the EdReady English score and the ENGL 111 grade, a scatterplot was created. Visual inspection of the scatterplot did not reveal a linear relationship between the EdReady English score and the ENGL 111 grade. Figure 5 depicts the relationship of EdReady English scores and students' grades in ENGL 111, where 0=F, FW, or W, 1=D, 2=C, 1=B, and 4=A.

A visual inspection of the plot of standardized residuals versus standardized predicted values revealed there was homoscedasticity. Visual inspection of Normal Q-Q Plots showed ENGL 111 grades were not normally distributed. To examine the relationship between the EdReady English scores and the grades in ENGL 111, a linear regression was run. The results of the regression revealed that the EdReady English score and the ENGL 111 grade did not have a statistically significant relationship, F (1, 498) = 1.41, p= .236. The EdReady English score explained .3% of the variability in the ENGL 111 grade with an adjusted R^2 of .1%. Because there was no relationship between the EdReady score and the ENGL 111 grade, the null hypothesis was retained.

Figure 5

Relationship between ENGL 111 Grades and EdReady English Scores (2020-2022)



Research Question 1b (RQ1b): What scores on the EdReady English placement test predict success (C or higher) in the first credit-bearing English course, ENGL 111?

Table 13 shows the frequency of grades in the data set. A grade of C or higher is considered a successful completion of ENGL 111. 43.8% of grades in the EdReady English sample were below a C, which is the grade required for students to fulfill the minimum requirements for most academic programs at the LMCCS. A C is also required for students to transfer the course credit to most four-year colleges in the midwestern state.

Table 13

Frequency of ENGL 111 Grades among Students Placed by EdReady English (2020-2022)

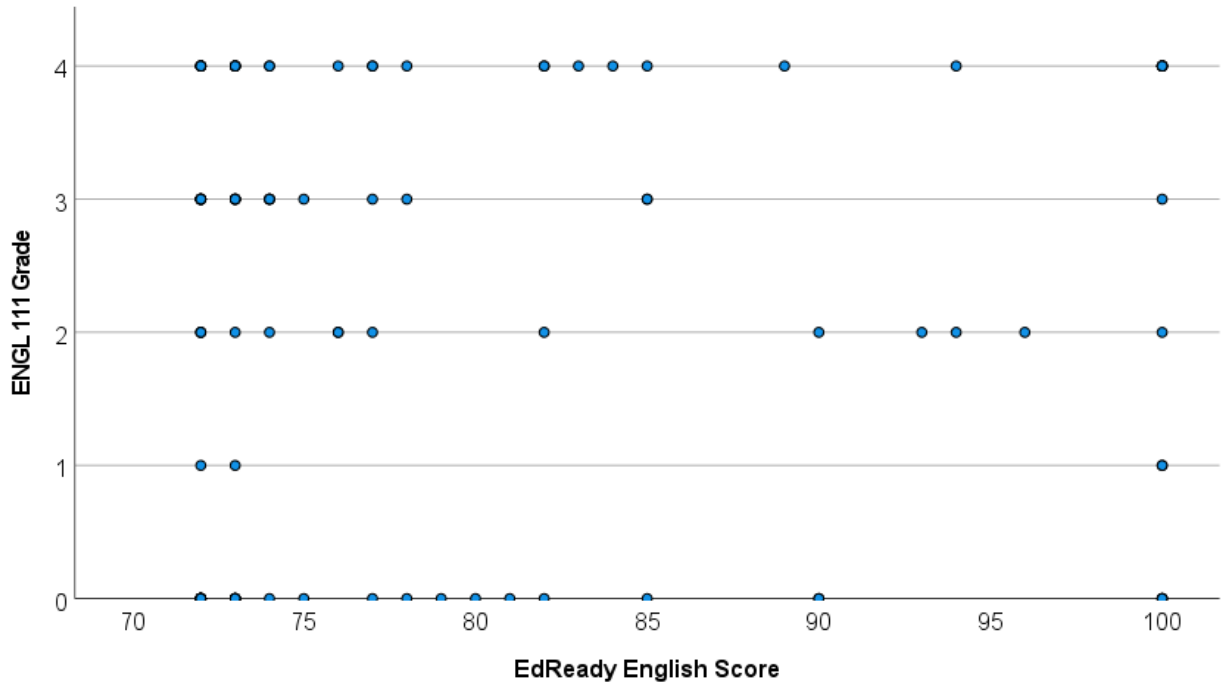
ENGL 111 Grade	Frequency	Percent	Valid Percent	Cumulative Percent
F, FW, W	205	41.0	41.0	41.0
D	14	2.8	2.8	43.8
C	49	9.8	9.8	53.6
B	92	18.4	18.4	72.0
A	140	28.0	28.0	100.0
Total	500	100.0	100.0	

To test the relationship between the predictor variable, the EdReady English score, and the criterion variable, successful completion of ENGL 111, defined as a C or higher, a linear regression was run. A visual inspection of the plot of standardized residuals versus standardized predicted values revealed there was homoscedasticity. The regression showed there was not a linear relationship between the EdReady English score and a grade of C or higher in ENGL 111 F (1, 293) = 1.073, p= .301. The linear regression revealed the EdReady English score explained .4% of the variability in the ENGL 111 grade of a C or higher with an adjusted R^2 of .02%.

Because 77.8% of students in the sample earned a score of 70 or 71 on EdReady English, it is plausible that some students stopped working on EdReady after earning the required cut score, 70. Therefore, a linear regression was run on all EdReady English scores 72 and up to determine if higher scores were more closely related to a successful grade in ENGL 111, defined as a C or higher. Figure 6 depicts the EdReady English scores 72-100 and the distribution of ENGL 111 grades C or higher.

Figure 6

Relationship between ENGL 111 Grades and EdReady English Scores 72-100 (2020-2022)



A visual inspection of the residuals showed normality and homoscedasticity. A linear regression revealed there was not a statistically significant relationship between EdReady English scores from 72-100 and grades of C or higher in ENGL 111 F (1, 65) = .244, p= .623. An EdReady English score of 72 or higher explained .4% of the variability in an ENGL 111 grade C or higher with an adjusted R^2 of -1.2%. Scores of 72-100 on the EdReady English placement test were not predictive of success (C or higher) in ENGL 111. Because a linear relationship was not found between the EdReady English score and a passing grade, defined as a C or higher in ENGL 111, RQ1b can be answered as follows: no EdReady English scores were found to be predictive of a C or higher in ENGL 111.

Research Question 2 (RQ2): How do grades in the first credit-bearing English course, ENGL 111, vary for different student subgroups (age, race, and gender) placed using the EdReady English assessment?

RQ2 Age: How do grades in the first credit-bearing English course, ENGL 111, vary by age for students placed using the EdReady English assessment?

$H2_0$: There are no differences in the medians of students' ENGL 111 grades by age.

H2: There are differences in the medians of students' ENGL 111 grades by age.

The frequency of all ages in the EdReady English sample is shown in Appendix A. The average age of students placed into ENGL 111 by EdReady English was 24.18 (*N*=500). 50.4% of students in the sample were 24 or younger, and the oldest student in the sample was 59. The unique age categories used to test RQ2 are represented in Table 14, which shows the median grades by age category for those placed into ENGL 111 by EdReady English. The average age of students in the EdReady English sample, (*m*=24.18), is younger than the general population at the campus of the LMCCS. At the campus of LMCCS 67.3% of students are under 30 and the largest group is 25-29, making up 18.4% of the population. In the EdReady English sample, 68.2% of students were under 30, and the largest group was 18- and 19-year-old students, who made up 23.8% of the sample. The most commonly reported age was 18, representing 13.4% of the students in the EdReady English group.

Table 14

Age Categories and Median Grades for Students Placed into ENGL 111 by EdReady English (2020-2022)

Age Group	N	Median Grade in ENG 111
14 to 19	134	1.00 (D)
20 to 24	118	2.00 (C)
25 to 31	124	2.00 (C)
32 and up	124	3.00 (B)
Total	500	2.00 (C)

41% (*n*=205) of students in the EdReady English sample did not pass ENGL 111, so the data was skewed. Because the data was not normally distributed as determined by a visual inspection of Normal Q-Q Plots, a Kruskal-Wallis H test was run to determine if there were differences in ENGL 111 grades

among the four age groups: 14-19 (*n*=134), 20-24 (*n*=118), 25-31 (*n*=124), 32 and up (*n*=124). Distributions of ENGL 111 grades were similar for all groups, as assessed by visual inspection of a boxplot. Median ENGL 111 grades were statistically significantly different between groups, $\chi^2(3) = 13.542$, $p = .004$. Using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons, pairwise comparisons were performed. Adjusted *p*-values are presented. A post hoc analysis revealed statistically significant differences in median ENGL 111 grades between students ages 14-19 (*mdn*=1) and students ages 32 and older (*mdn*=3) ($p < .001$), but not between students who are 20-24 (*mdn*=2) or 25-31 (*mdn*=2) or any other group combination. Therefore, the null hypothesis was rejected for the age. subgroup.

RQ2 Race: How do grades in the first credit-bearing English course, ENGL 111, vary by race for students placed using the EdReady English assessment?

$H3_0$: There are no differences in the medians of students' ENGL 111 grades by race.

H3: There are differences in the medians of students' ENGL 111 grades by race.

White students made up most of the EdReady English sample (*n*=392), and African American students were the second largest group (*n*=61). Table 15 depicts all the racial categories tested for RQ2. Native Hawaiian and Pacific Islander (*n*=1) and American Indian and Alaska Native (*n*=1) were not included because of their small sample size. Eight students did not disclose a specific race.

Table 15

Frequency of Racial Categories for Students Placed into ENGL 111 by EdReady English 2020-2022

Racial Category	Frequency	Percent	Valid Percent	Cumulative Percent
Black or African American	61	12.4	12.4	12.4
White	392	80.0	80.0	92.4
Two or More Races	23	4.7	4.7	97.1
Hispanic or Latino	8	1.6	1.6	98.8
Asian	6	1.2	1.2	100.0
Total	490	100.0	100.0	

The median grades of students in each racial category were compared, and white students and students belonging to two or more races had the highest median grades, 2.50 and 2.00, respectively. These medians represent a C in ENGL 111. Black or African American students and Asian students had a median grade of D (1.00). All median grades by racial category can be viewed in Table 16.

Table 16

Racial Categories and Median Grades for Students Placed into ENGL 111 by EdReady English (2020-2022)

Racial Category	N	Median Grade in ENG 111
Black or African American	61	1.00 (D)
White	392	2.50 (C)
Two or More Races	23	2.00 (C)
Hispanic or Latino	8	.00 (F)
Asian	6	1.00 (D)
Total	490	2.00

A visual inspection of Normal Q-Q Plots revealed the data was not normally distributed. A Kruskal-Wallis H test was conducted to determine if there were differences in ENGL 111 grades among racial groups: Black or African American *(n*=61), White (*n*=392), two or more races (*n*=23), Hispanic or Latino (*n*=8), or Asian (*6*). Distributions of ENGL 111 grades were similar for all groups, as assessed by visual inspection of a boxplot. ENGL 111 grades ranged from Hispanic or Latino (*mdn* =0.00), Black or African American (*mdn*=1.0), Asian (*mdn*= 1.0) to two more races (*mdn*= 2.0) and White (*mdn*=2.50). However, the differences were not statistically significant $\chi^2(4) = 7.581$, $p = .108$. The null hypothesis was therefore retained for the racial subgroup.

RQ2 Gender: How do grades in the first credit-bearing English course, ENGL 111, vary by gender for students placed using the EdReady English assessment?

$H2_0$: There are no differences in the medians of students' ENGL 111 grades by gender.

H2: There are differences in the medians of students' ENGL 111 grades by gender.

The majority of students placed by EdReady English identified as female (*n*=331), as depicted in Table 17. Four students did not report a specific gender. Although there were more female students in the study, students who identified as male had a slightly higher mean grade, 1.93, compared to female students, 1.88. Both means represent a grade close to a C (2.00).

Table 17

Gender Categories and Mean Grades for Students Placed into ENGL 111 by EdReady English (2020-2022)

Gender Group	N	Mean
Female	331	1.88
Male	165	1.93
Total	496	2.00

Data was not normally distributed, as determined by a visual inspection of Normal Q-Q Plots. However, normally distributed data is not a required assumption for a t-test (Ruth, 2011). The results of a t-test showed males (*n*=165) had slightly higher mean grades in ENGL 111 (*m*=1.93, *sd*=1.73) than females (*m*=1.88, *sd*=1.72). There was homogeneity of variances, as assessed by Levene's test for equality of variances (p = .778). The results of the t-test indicated there was not a statistically significant difference in the means of the ENGL 111 grades for males and females, M = -0.05, 95% CI [-0.38, 0.27], t (494) = -0.33, p = .778. Because the data was not normally distributed, medians were also calculated, as depicted in Table 18.

Table 18

Gender Categories and Median Grades for Students Placed into ENGL 111 by EdReady English

Gender Group	N	Median
Female	331	2.00 (C)
Male	165	2.00 (C)
Total	496	2.00

Although the t-test did not reveal statistically significant results, a Mann-Whitney U test was also run since the data was not normally distributed as determined by a visual inspection of Normal Q-Q Plots. Distributions of the ENGL 111 grades for males and females were similar, as assessed by visual inspection. A Mann-Whitney U test showed median ENGL 111 grade differences were not statistically significant between males (*mdn*=2.0) and females (*mdn*=2.0), *U*=26,791.00, *z*=-.362, *p* =.718. Therefore, the null hypothesis was retained for the gender subgroup.

Research Question 3: How do the ENGL 111 grades of students placed into their first credit-bearing English course by EdReady English compare to the ENGL 111 grades of students placed by other criteria (EdReady English, previous coursework, Accuplacer, previous degree, remedial course, HSGPA, co-requisite, SAT, PSAT, pr ACT)?

$H5_0$: There are no differences in the medians of students' ENGL 111 grades by placement criteria.

H5: There are differences in the medians of students' ENGL 111 grades by placement criteria.

Median grades for all placement methods varied widely, with students placed by previous degree having the highest median 4.0 (A) to students who were placed by the co-requisite model having the lowest median .50 (F). Table 19 outlines all ENGL 111 median grades by placement method. The average median grade for the entire data set was 3.00 (B).

Table 19

ENGL 111 Median Grades for all Placement Methods (2020-2022)

Placement Groups	N	Median
Accuplacer	24	2.00 (C)
ACT	12	3.00 (B)
Co-requisite	10	.50 (F)
EdReady English	500	2.00 (C)
HSGPA	201	3.00 (B)
Previous Coursework	79	3.00 (B)
Previous Degree	19	4.00 (A)
PSAT	27	2.00 (C)
Remedial Course	10	3.00 (B)
SAT	66	3.00 (B)
Total	948	3.00

ENGL 111 grades were not normally distributed for all placement groups, as assessed by visual inspection of Normal Q-Q Plots. A Kruskal-Wallis H test was run to determine if there were differences in ENGL 111 grades among the placement groups: Accuplacer (*n*=24), ACT (*n*=12), Co-requisite (*n*=10), EdReady English (*n*=500), HSGPA (n=201), Previous coursework (*n*=79), Previous degree (*n*=19), PSAT (*n*=27), Remedial coursework (*n*=10), and SAT (*n*=66). The distributions of ENGL 111 grades were not similar for all groups, which was determined by visual inspection of a boxplot. A Kruskal-Wallis H test determined the ENGL 111 grade distributions were statistically significant between groups, $\chi^2(9) = 30.463$, $p<.001$. A post hoc analysis revealed statistically significant differences in ENGL 111 grades between the group of students placed by the co-requisite model (*mean rank=311.90*) and those placed by previous degree (*mean rank=656.71*) ($p = .035$) and between the group placed by EdReady English (mean rank=445.85) and those placed by previous degree (*mean rank=656.71*) ($p = .027$), but not among any other group combinations. Therefore, the null hypothesis was rejected.

Students who have already obtained a previous college degree may have different academic proficiencies than students who are just beginning college, as is the case for most students taking EdReady English and the co-requisite model. Therefore, it may not be appropriate to compare the group of students with college degrees and the remaining groups who have not earned a degree. Table 20 shows how removing the group of students who were placed by previous degree altered the total median for the sample from 3.00 to 2.00.

Table 20

ENGL 111 Median Grades for all Placement Methods, Excluding Previous Degree (2020-2022)

Placement Groups	N	Median
Accuplacer	24	2.00 (C)
ACT	12	3.00 (B)
Co-Requisite	10	.50 (F)
EdReady English	500	2.00 (C)
HSGPA	201	3.00 (B)
Previous Coursework	79	3.00 (B)
PSAT	27	2.00 (C)
Remedial Course	10	3.00 (B)
SAT	66	3.00 (B)
Total	929	2.00

ENGL 111 grades were not normally distributed for all placement groups, as assessed by visual inspection of Normal Q-Q Plots. A Kruskal-Wallis H test was run to determine if there were differences in ENGL 111 grades among the placement groups, excluding students placed by previous degree: ACT (*n*=12), Accuplacer (*n*=24), Co-requisite (*n*=10), EdReady English (*n*=500), HSGPA (n=201), Previous coursework (*n*=790), PSAT (*n*=27), Remedial course (*n*=10), and SAT (*n*=66). The distributions of ENGL 111 grades were not similar for all groups, which was determined by visual inspection of a boxplot. A Kruskal-Wallis H test determined the distributions were significantly different between groups, $\chi^2(8) = 21.256$, p=.006. However, there were no statistically significant pairwise comparisons. All adjusted *p*-

values were above .05, but the difference between the grades of students placed by EdReady English (mean rank=440.44) and those placed by HSGPA (mean rank=508.60) was nearly statistically significant, *p*=.055.

Because students who are placed into ENGL 111 through the co-requisite model take ENGL 111 simultaneously with their remedial English course, it could be argued that this group is not comparable to the other placement groups, where students are taking ENGL 111 without additional class support. Although the sample size for the co-requisite group was small (*n*=10), the median was significantly lower than all other groups (*mdn*=.05). Median grades of students placed by all methods excluding previous degree and co-requisite model are represented in Table 20. It appears the co-requisite group differs from the other placement groups not only because students placed by co-requisite are taking English remediation at the same time as ENGL 111, but also because their median grades were pointedly lower than all other groups. Therefore, another Kruskal-Wallis H test was run to determine if removal of the co-requisite placement group had an impact on the distributions.

Table 21

ENGL 111 Median Grades for all Placement Methods, Excluding Previous Degree and Co-requisite

Placement Groups	N	Median
Accuplacer	24	2.00
ACT	12	3.00
EdReady English	500	2.00
HSGPA	201	3.00
Previous Coursework	79	3.00
PSAT	27	2.00
Remedial Course	10	3.00
SAT	66	3.00
Total	919	3.00

A Kruskal-Wallis H test determined there were differences among all placement groups excluding the co-requisite group: Accuplacer (*n*=24), ACT (*n*=12), EdReady English (*n*=500), HSGPA (*n*=201), Previous coursework (*n*=790), PSAT (*n*=27), Remedial coursework (*n*=10), and SAT (*n*=66). The distributions of ENGL 111 grades were similar for all groups, as determined by visual inspection of a boxplot. Median ENGL 111 grade differences were statistically significant between the various placement groups, $\chi 2(7) = 17.480$, $p = .015$. Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted *p*-values are presented. A post hoc analysis revealed statistically significant differences in ENGL 111 grades between the group of students placed by EdReady English (*mdn*=2.00) and those placed by HSGPA (*mdn*=3.00) ($p = .044$), but not among any other group combinations. When the outlier placement group, those placed by co-requisite, was removed, the statistically significant difference between students placed by EdReady English and those placed by HSGPA became more pronounced. All three tests run for RQ3 showed statistically significant differences in the grade distributions of students placed by all placement methods, all methods excluding previous degree, and all placement methods excluding previous degree and co-requisite. Therefore, the null hypothesis was rejected.

Summary

The purpose of this causal comparative quantitative study was to analyze the accuracy of the EdReady English placement tool utilized at one campus of a LMCCS. The study explored students' scores on the EdReady English test and their grades in the first credit-bearing English class, ENGL 111. First, a linear regression was run to determine the relationship between students' scores in EdReady and their grades in ENGL 111. The results of the regression revealed that the EdReady English scores and the ENGL 111 grades did not have a linear relationship, $F(1, 498) = 1.41$, $p = .236$. The EdReady English score explained .3% of the variability in the ENGL 111 grade with an adjusted R^2 of .1%. Additionally, the

regression showed there was not a linear relationship between the EdReady English score and a grade of C or higher in ENGL 111 F (1, 293) = 1.073, *p*=.301. The linear regression revealed the EdReady English score explained just .4% of the variability in the ENGL 111 grade of a C or higher with an adjusted R^2 of .02%.

Next, EdReady English scores and ENGL 111 grades were examined by student subgroups (age, race, and gender). A Kruskal-Wallis H test was run to determine if there were differences in ENGL 111 grades among student age categories. Median ENGL 111 grades were statistically significant between groups, $\chi^2(3) = 13.542$, $p = .004$. A post hoc analysis revealed statistically significant differences in median ENGL 111 grades between students ages 14-19 (*mdn*=1) and students ages 32 and older (*mdn*=3) (*p* <.001), but not between students who are 20-24 (*mdn*=2) or 25-31 (*mdn*=2) or any other group combination. A Kruskal-Wallis H test was conducted to determine if there were differences in ENGL 111 grades among racial groups, and the differences were not statistically significant $\chi^2(4) = 7.581$, $p = .108$. Lastly, a Mann-Whitney U test was run to determine if there were differences in ENG 111 grades between males and females who were placed by EdReady English. Median ENGL 111 grades were not statistically significantly different between males (*mdn*=2.0) and females (*mdn*=2.0), *U* = 26,791.00, *z*=-.362, *p* =.718.

Finally, a Kruskal-Wallis H test was run to determine if there were differences among all placement groups excluding students placed by previous degree and co-requisite. Median ENGL 111 grades were statistically significantly different between the various placement groups, $\chi2(7) = 17.480$, *p*=.015. A post hoc analysis revealed statistically significant differences in ENGL 111 grades between the group of students placed by EdReady English (*mdn* =2.00) and those placed by high school GPA (*mdn*=3.00) (*p* =.044), but not among any other group combinations. Table 22 contains a summary of findings, and Chapter 5 will explore conclusions, implications, and suggestions for future research.

Table 22

Summary of Chapter 4 Findings

Research Question	Hypothesis	Statistical Analysis	Results
Research Question 1a (RQ1a): What is the relationship between students' scores on the EdReady English placement test and their grades in the first credit-bearing English course, ENGL 111?	*H10: There is no statistically significant relationship between the predictor variable, the EdReady English score, and the grade in ENGL 111.* *H1: There is a statistically significant relationship between the predictor variable, the EdReady English score, and the grade in ENGL 111.*	*Linear Regression*	*Retain null hypothesis* p=.236
Research Question 1b (RQ1b): What scores on the EdReady English placement test predict success (C or higher) in the first credit-bearing English course, ENGL 111?	*None*	*Linear Regression*	*There is not a linear relationship between EdReady English scores and ENGL 111 grades,* p=.301
RQ 2: How do grades in the first credit-bearing English course, ENGL 111, vary by age for students placed using the EdReady English assessment?	$H2_0$: There are no differences in the medians of students' ENGL 111 grades by age. H2: There are differences in the medians of students' ENGL 111 grades by age.	Kruskal-Wallis H	*Reject the null hypothesis,* p=.004
RQ2: How do grades in the first credit-bearing English course, ENGL 111, vary by race for students placed using the EdReady English assessment?	$H3_0$: There are no differences in the medians of students' ENGL 111 grades by race. H3: There are differences in the medians of students' ENGL 111 grades by race.	Kruskal-Wallis H	*Retain the null hypothesis,* p =.108
RQ2: How do grades in the first credit-bearing English course, ENGL 111, vary by gender for students placed using the EdReady English assessment?	$H4_0$: There are no differences in the medians of students' ENGL 111 grades by gender. H4: There are differences in the medians of students' ENGL 111 grades by gender.	Mann-Whitney U	*Retain the null hypothesis,* p =.7180
Research Question 3 (RQ3): How do the ENGL 111 grades of students placed into their first credit-bearing English course by EdReady English compare to the ENGL 111 grades of students placed by other criteria?	$H5_0$: There are no differences in the medians of students' ENGL 111 grades by placement criteria. H5: There are differences in the medians of students' ENGL 111 grades by placement criteria.	Kruskal-Wallis H	*Reject the null hypothesis,* p =.015

Chapter 5: Conclusions

Introduction

The purpose of this study was to analyze the accuracy of a new placement tool, EdReady English, which was recently adopted by a Large Midwestern Community College System (LMCCS). The study examined students' EdReady English scores and their grades in the first-year English composition course at one campus of the LMCCS. Students' grade outcomes were explored by student subgroups, including age, race, and gender. Finally, the grades of students who enrolled in the first-year composition course were compared by placement method. Chapter 1 outlined the need for the study by describing the critical role placement tests play in students' educational timelines and the lack of available research on the EdReady English placement tool. Chapter 2 provided context by exploring the history of open access policies in community colleges, the use and implications of various placement methods, and the need for accuracy and equity in the placement process. The study design, participants, and data collection were discussed in Chapter 3, and Chapter 4 outlined the demographic information and the results of data analysis. In Chapter 5, the research findings will be discussed along with implications for policy and recommendations for future research.

Summary of Findings

EdReady English is a new placement test being utilized at one campus of a LMCCS; however, there is no extant research on the accuracy of this assessment. This placement test serves a critical role because many students must take the EdReady English placement test before enrolling in credit-bearing courses at the LMCCS. It is thereby essential that this assessment can accurately and equitably identify students who will be successful in their first credit-bearing English course. This study explored the following research questions.

Research Question 1 (RQ1): How accurately does the EdReady English test place students into their first credit-bearing English course, ENGL 111?

a. What is the relationship between students' scores on the EdReady English placement test and their grades in the first credit-bearing English course, ENGL 111?
b. What scores on the EdReady English placement test predict success (C or higher) in the first credit-bearing English course, ENGL 111?

To explore RQ1a, a linear regression was run to determine the relationship between students' scores in EdReady and their grades in ENGL 111. The results revealed that the EdReady English scores and the ENGL 111 grades did not have a linear relationship. The EdReady English score explained only .3% of the variability in the ENGL 111 grade. For RQ1b, a linear regression showed there was not a linear relationship between the EdReady English score and a grade of C or higher in ENGL 111. The EdReady English score explained just .4% of the variability in the ENGL 111 grade of a C or higher.

The findings of this study suggest there is a weak relationship between a student's EdReady English score and their performance in the first-year English composition course. Previous studies have shown that English placement tests are less accurate than math placement tests at predicting first-year course success (Hughes et al., 2010; James, 2006; Scott-Clayton, 2012; Scott-Clayton et al., 2014). Therefore, it is possible EdReady English suffers from similar accuracy challenges. For example, Accuplacer was found to be more accurate at predicting the success of students in their first-year math course than in the first-year English class (Belfield & Crosta, 2012; Mattern et al., 2009; Scott-Clayton et al., 2014). Studies of EdReady Math revealed that students who tested into their first-year math course had higher grades than students who tested in using other placement methods (The NROC Network, 2019; Thornton et al., 2019), but these studies did not examine the specific relationship between the EdReady score and the student's grade in the math class. It is therefore unknown if the EdReady English

test is less accurate than the EdReady Math test. However, the lack of a relationship between the EdReady English score and a student's grade in ENGL 111 is consistent with other studies that show a weak relationship between English placement scores and students' grades in the first credit-bearing English course (Elliot et al., 2012; James, 2006; Medhanie et al., 2012; Scott-Clayton et al., 2014).

The lack of a linear relationship between the EdReady English score and a student's grade in ENGL 111 suggests the EdReady English score does not necessarily indicate a students' readiness for the course. A scatterplot depicted in Figure 5 illustrates no particular pattern in the English grades of students placed by EdReady English. For example, some students who scored 100, a perfect score on the EdReady English assessment, did not pass ENGL 111. In fact, 41% of students who were placed into ENGL 111 by EdReady English failed the course. This was the second-highest failure rate of any other placement method in the study. The high failure rates in ENGL 111 could indicate that the EdReady English score is not predictive of a student's competency in the skills necessary to succeed in the class. However, students who placed into ENGL 111 through Accuplacer had a 37.5% failure rate, and those who placed using PSAT had a similar rate of 37.04%. This suggests that although students placed by EdReady English had high failure rates, these rates were consistent with some other placement methods.

Failure rates are only one measure of placement test accuracy, so it is important to consider the success rates of students who used EdReady English. Previous studies have shown that placement tests are more accurate at predicting which students will be successful in a class, for example, earning a B or higher, than those who will fail (Belfield & Crosta, 2012; Mattern et al., 2009; Scott-Clayton, 2012). The relationship between the EdReady English score and a successful completion of ENGL 111, defined as a C or higher, was examined in RQ1b. Once again, there was no linear relationship found between the EdReady English score and an ENGL 111 grade of C or higher, suggesting that no EdReady English score is

significantly predictive of a successful completion of the course. Comparing the EdReady English score to the final ENGL 111 grade is the most common method for assessing the predictive accuracy of a placement test (Bowen et al., 2009; College Board, 2019; James, 2006; Medhanie et al., 2012). This is because a placement test is only as valuable as its correlation to students' performance in the course it is designed to predict (Armstrong, 1999). Therefore, as previous students have shown regarding other placement tests (Elliot et al., 2012; James, 2006; Medhanie et al., 2012; Scott-Clayton et al., 2014), EdReady English is not predictive of a student's grade in ENGL 111, nor is it predictive of a successful completion, defined as a C or higher in ENGL 111, at this campus of the LMCCS.

The weak predictive power of EdReady English could be impacted by other confounding factors. For example, ENGL 111 has high failure rates at this campus and across the LMCCS. Statewide, 23% of students earned a D or below in ENGL 111, an average across 19 campuses of the LMCCS in 2020 and 2021. At this campus of the LMCCS, 31.13% of students earned a D or below. This suggests that the course is challenging, not only for students in the LMCCS, but for students at this campus in particular. Another confounding factor could be that the content of the EdReady English test is not a close match to the course content of ENGL 111. This study did not examine content validity, but several studies have shown that placement test accuracy can vary by college and even by campus, underscoring the need to validate tests in different contexts (Coleman & Smith, 2020; Ganga & Mazzariello, 2019; Horn et al., 2009; Melguizo et al., 2014). If the content of the EdReady English diagnostic tool is not a close match to that of the ENGL 111 course taught at this campus of the LMCCS, accuracy rates could be adversely affected.

Research Question 2 (RQ2): How do grades in the first credit-bearing English course (ENGL 111) vary for different student subgroups (age, race, and gender) placed using the EdReady English assessment?

A Kruskal-Wallis H test was run to determine if there were differences in ENGL 111 grades among student age categories. Median ENGL 111 grades were found to be statistically significant between groups. A post hoc analysis revealed statistically significant differences in median ENGL 111 grades between students ages 14-19 and students ages 32 and older, but not between any other group combination. A Kruskal-Wallis H test was conducted to determine if there were differences in ENGL 111 grades among racial groups, but the differences were not statistically significant. For the final subgroup, gender, a Mann-Whitney U test determined median grades were not significantly different between males and females.

The largest age group in the EdReady English placement group was 14-19, and 252 students, which comprised over half the sample, were ages 24 or below. This reveals that most students who placed into ENGL 111 using EdReady English were relatively young, and 27% (*n*=134) were still teenagers when they took the placement test. Interestingly, there was not a statistically significant difference in the ENGL 111 grades of students by age except for two categories, ages 14-19 and ages 32 and up. These two groups had statistically significant differences in median ENGL 111 grades, such that students ages 14-19 had a median grade of D, and students ages 32 and up had a median grade of B. Therefore, the youngest students who used EdReady English to test into ENGL 111 had worse grade outcomes than students 32 and older. This may suggest EdReady English is a more accurate predictor of the success of students 32 and up in ENGL 111. It may also reveal that students ages 32 and up have higher levels of college readiness than students ages 14-19 and are therefore more successful in ENGL 111 once they are placed into the course by EdReady English. Since the study found no significant differences in ENGL 111 grades among any other age groups, it appears students older than 20 all have similar grade outcomes when placed by EdReady English. Previous studies have uncovered heterogeneity in the placement process (Daugherty, 2021; Strayhorn, 2014), highlighting that student subgroups may have different

grade outcomes even when placed by the same method. However, these studies focus on race and gender, not age. This study demonstrates differences in grade outcomes for the EdReady English placement method do exist between students ages 14-19 and those ages 32 and up, but not for any other age group categories.

The second subgroup explored by RQ2 was race. The most significant difference in the racial composition of students placed by EdReady English compared to those placed by all other methods was a higher percentage of students who identified as Black or African American. 12% of students who placed into ENGL 111 using EdReady English identified as Black or African American, while just 7% of students who placed by other methods identified this way. This may point to an important role for EdReady English in providing greater access to the first-year English course for Black or African American students. Previous students have determined that providing multiple placement methods for demonstrating college readiness benefits Black or African American students by opening more pathways to enter college-level courses (Barnett et al., 2020; Koretz et al., 2016). Studies have found that racial bias in placement tests like the ACT and SAT harms minority students' chances of testing into college-level courses (Atkinson & Geiser, 2009; Bowen et al., 2009; Geiser et al., 2007; Nettles, 2019), and the SAT and ACT scores of African American students are still lower nationally than those of Asian, White, and Hispanic students (McNeish et al., 2015; Smith & Reeves, 2020). It is plausible that Black or African American students may be using EdReady English as a successful alternate pathway to demonstrate college readiness instead of submitting their ACT or SAT scores. It is also possible that the pandemic hindered the access of African American students to ACT/SAT testing centers. Pandemic lockdowns closed testing centers across the country during 2020, drastically reducing the number of students who took these placement tests (Backstrom and Shultz; 2022; Marcus, 2021). Therefore, it is also possible

that fewer African American students took proctored placement tests like the SAT or ACT and had to rely on the EdReady English test as an alternate placement method.

Although the group of students placed by EdReady English had a greater percentage of African American students than those placed by other methods, the median grades of all racial groups in the study were not significantly different from one another. The study found no statistically significant differences in the median ENGL 111 grades of EdReady English students by racial category. Previous studies have identified differences in the outcomes of placement tests by race (Atkinson & Geiser, 2009; Geiser et al., 2007; Klasik & Strayhorn, 2018; Nettles, 2019; Ngo & Kwon, 2014; Ngo et al., 2020; Zwick & Sklar, 2005). These differences were also present in the current study, which showed Hispanic students had the lowest ENGL 111 median grade, F, Asian and Black or African American students had a median grade of D, and White and multi-racial students had a median grade of C. However, these differences were not statistically significant. Absence of difference does not necessarily mean absence of bias in the EdReady English test, but it appears students placed by EdReady English have equitable grade outcomes in ENGL 111.

Gender was the final subgroup explored in RQ2. Previous studies found gender differences in placement test outcomes (Ngo et al., 2020; Strayhorn 2014), but this study found no statistically significant differences in the median ENGL 111 grades of EdReady English students by gender. The sample was predominately female (*n*=331) in comparison to male (*n*=165), but the median grades of both groups were C. Although the ENGL 111 mean grades for male students (1.93) were higher than the mean grades for female students (1.88), these differences were not statistically significant. This does not necessarily indicate there is no gender bias in the EdReady English test, but the study found that the ENGL 111 grades were similar for students placed by this method. Students placed by EdReady English

have similar grade outcomes by gender, so it appears to be an equitable placement method for this subgroup.

Research Question 3 (RQ3): How do the ENGL 111 grades of students placed into their first credit-bearing English course by EdReady English compare to the ENGL 111 grades of students placed by other criteria (EdReady English, previous coursework, Accuplacer, previous degree, remedial course, HSGPA, co-requisite, SAT, PSAT, pr ACT)?

A Kruskal-Wallis H test determined median ENGL 111 grades were significantly different between the various placement groups. The initial analysis of all placement methods showed significant differences in the median ENGL 111 grades of students placed by previous degree and those placed by the co-requisite model. Additionally, statistically significant differences in the median ENGL 111 grades were found between students placed by previous degree and those placed by EdReady English. However, these comparisons may not be appropriate because students who have already earned a college degree likely have different levels of academic preparation than students who test into ENGL 111 using the co-requisite model. These students need remediation in reading and/or writing and are taking a concurrent remedial class to support their progress in ENGL 111. Likewise, students who use EdReady English to test into ENGL 111 do not have any other measures to show college readiness; therefore, they likely have different levels of preparation than students who have already earned a degree. Because students placed by previous degree and the co-requisite model had medians that were outliers in the data set, and because the characteristics of both placement groups differed so significantly from the other placement methods, another Kruskal-Wallis H test was run using all placement methods except previous degree and co-requisite model. The results showed statistically significant differences among groups. A post hoc analysis revealed statistically significant differences in

ENGL 111 grades between the group of students placed by EdReady English and those placed by HSGPA, but not among any other group combinations.

A significant finding is the distribution of placement methods among students in the sample. Over half, 53%, of all students in the study placed into ENGL 111 using EdReady English. This may reflect the challenges students faced during the COVID-19 pandemic lockdowns when ACT, Accuplacer, PSAT, and SAT testing centers were closed (Backstrom & Shultz, 2022; Marcus, 2021). Since EdReady English is not proctored, it may have been the only testing method available to students. Nationally, fewer colleges are requiring the SAT and ACT for admission, so the high number of students using EdReady English may also reflect the popularity of test-optional or test-flexible policies (Backstrom & Shultz, 2022). Nevertheless, the large proportion of students placing into ENGL 111 using EdReady English highlights the influence of this new method and underscores the need to validate its accuracy and equity. The high percentage of students using this method to place into ENGL 111 may also signal students' preference for the EdReady English tool over other methods. Again, convenience may play a role in students' decision making because high school transcripts are not easy for all students to acquire (Burdman et al., 2015; Markle & Robbins, 2013; Woods et al., 2018).

Despite the challenges some students may face obtaining transcripts, HSGPA was the second-largest placement method, representing 21% of the students in the study. This could also be an effect of the COVID-19 pandemic testing center closures or a reflection of students' preference for using multiple measures to demonstrate their proficiencies. For example, when given a choice of placement options, students may choose to submit their high school transcripts if they feel their ACT or SAT scores are not ideal (Belasco et al., 2015). This is a positive trend given that HSGPA tends to be a more accurate predictor of college readiness than the ACT or SAT (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Belfield & Crosta, 2012; Bowen et al., 2009; Geiser et al., 2007; Koretz et al., 2016; Scott-Clayton, 2012;

Zwick & Sklar; 2005). In this study, only 11% of students used the ACT, PSAT, or SAT to place into ENGL 111. EdReady English and HSGPA were the most common placement methods, representing 74% of students who took ENGL 111. This may suggest students prefer these placement methods or find them more accessible or convenient. This finding coincides with recent studies showing the number of students using SAT and ACT scores for college admission and/or placement testing is on the decline following the 2020 pandemic lockdowns (Backstrom & Shultz, 2022; Hoover, 2021; Marcus, 2021).

Students placed by different methods had varying levels of success in ENGL 111. Not surprisingly, students who had already earned a degree had the highest success rate, 89.47%, defined as a C or higher in ENGL 111, than any other group. This suggests that students who place using a previous degree have an appropriate level of academic preparation and/or sufficient persistence and motivation to complete the course. Students who had completed some amount of college coursework, similarly, had high levels of success in ENGL 111; 75.95% of students in this placement group earned a C or higher in ENGL 111. This is not surprising since students who have already learned to successfully navigate one or more college courses likely have the skills to do so again. The highest success rate among students who did not place by previous degree or previous coursework was HSGPA. 71.14% of students who placed into ENGL 111 using this method earned a C or higher. This finding coincides with previous studies that found HSGPA was the best predictor of college readiness (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Belfield & Crosta, 2012; Bowen et al., 2009; Geiser et al., 2007; Koretz et al., 2016; Scott-Clayton, 2012; Zwick & Sklar; 2005). This could be because HSGPA is collected over time and is a more accurate reflection of students' effort and motivation (Belfield et al., 2012) or because HSGPA is the result of multiple teachers assigning grades across many years (Allensworth & Clark, 2020). Regardless of the reason, this study supports the finding that students who are placed using HSGPA have higher success rates in the first-year English course than students who used placement tests.

When considering placement validity, it is also necessary to examine course failure rates since a failure may suggest a lack of academic preparation for the course (Scott-Clayton et al., 2014). Students who were placed into ENGL 111 by previous degree or previous coursework had the lowest failure rates, 10.53% and 21.52%, respectively. This again suggests that students who have already earned a degree or have completed some college coursework are academically prepared for ENGL 111. However, students who placed using HSGPA had similar failure rates as those who placed using previous coursework; only 23.88% of students placed using this method failed ENGL 111. This supports previous studies that found HSGPA is a strong predictor of college readiness (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Belfield & Crosta, 2012; Bowen et al., 2009; Geiser et al., 2007; Koretz et al., 2016; Scott-Clayton, 2012; Zwick & Sklar; 2005), but it also provides evidence that students placed using HSGPA have similar failure rates in ENGL 111 as those placed using previous coursework. This legitimizes the use of HSGPA as a placement method given that this study found success and failure rates for students placed by HSGPA were similar to those placed using previous college coursework. The success and failure rates suggest both groups have comparable levels of preparation for ENGL 111.

It is also useful to consider which methods had high failure rates and low success rates since this may suggest students placed by such methods were not well prepared for ENGL 111. This study found students placed by the co-requisite model had the lowest success rate; just 40% of students placed using this method earned a C or higher in ENGL 111. Students placed by Accuplacer, EdReady English, and PSAT all had similar rates of success. This suggests that students placed by these three methods demonstrated similar levels of academic preparedness and may face comparable challenges in ENGL 111. 54.17% of students placed by Accuplacer earned a C or higher in ENGL 111 compared to 56.2% of students placed by EdReady English. Students placed by PSAT had only a slightly higher success rate; just 59.26% of these students earned C higher in ENGL 111. These rates are much lower than other methods

such as HSGPA, which had a 71.14% success rate in ENGL 111. These lower success rates suggest students who are placed by co-requisite, Accuplacer, EdReady English, and PSAT may not have sufficient levels of academic preparedness to be successful in ENGL 111 or may need additional support to be successful in the course. These same placement methods also have high failure rates, defined as earning an F, FW, or W in the course. 50% of students placed by the co-requisite model failed ENGL 111, and 41% of students placed by EdReady English did the same. Both the Accuplacer and PSAT group had similar ENGL 111 failure rates at 37.5% and 37.04%, respectively. Again, the high failure rates suggest students placed by these methods may need additional academic support to be successful in ENGL 111. It also indicates that students placed by the co-requisite model, EdReady English, Accuplacer, and PSAT may have similar levels of academic preparedness. However, the sample of students placed by the co-requisite model contained only 10 students, so the conclusions about this placement model should be made cautiously.

Another useful component to consider when analyzing placement accuracy is course withdrawal rates. It is important to note that students may withdraw from a class for a variety of reasons, such as not liking the instructor or personal challenges (Wheland et al., 2012). However, one of the reasons students may withdraw is difficulty with the course content or lack of academic preparation (Scott-Clayton et al., 2014; Wheland et al., 2012). A course with high withdrawal rates may signal strong academic rigor, or it may reveal that students who are placed into the course do not have sufficient academic preparation. None of the students placed by previous degree withdrew from ENGL 111. SAT, likewise, had a low withdrawal rate of 1.51%. Students placed by both previous degree and the SAT had the lowest withdrawal rates in the study, which suggests either that students placed by such methods are appropriately prepared for the course content or that students placed by these methods are not sufficiently aware of withdrawal procedures. This seems unlikely for students placed by previous degree

since they have already navigated the college environment; however, students who were placed by the SAT may face this challenge. Students placed by Accuplacer had a very high withdrawal rate in ENGL 111, 16.67%, and students placed by the PSAT were close behind with a 14.81% withdrawal rate. Students placed by EdReady English had the third highest withdrawal rate, 11.60%. This is lower than the first two, but still much higher than the other placement methods such as HSGPA, which was only 6.97%. These high withdrawal rates may suggest that students placed by Accuplacer, PSAT, and EdReady English may not be sufficiently prepared academically for ENGL 111. This finding is aligned with previous research that shows English placement tests like Accuplacer are not a strong predictor of success in first-year English courses (Belfield & Crosta, 2012; Elliot et al., 2012; James, 2006; Medhanie, 2012; Ngo & Melguizo, 2016).

Since students may withdraw from a course for several reasons, high withdrawal rates alone are not necessarily indicative of a lack of academic preparedness. However, when combined with low success rates and high failure rates, withdrawal rates can create a broader picture of academic preparedness or lack thereof. The placement methods with a combination of high failure rates, low success rates (defined as a C or higher), and high withdrawal rates were Accuplacer, EdReady English, and PSAT. This combination of factors suggests that students placed by these methods may not have sufficient academic preparation to be successful in ENGL 111. The similar patterns of low success, high failure, and high withdrawal rates also suggest students placed by these three methods have comparable levels of academic preparation. It seems appropriate that students placed by EdReady English and Accuplacer would demonstrate similar levels of academic preparedness since both tests were given to students who did not have another placement metric to provide. Additionally, the LMCCS replaced Accuplacer with EdReady English, so it makes sense that similarly prepared students, who might have once taken the Accuplacer, are now required to take EdReady English. Students take the

PSAT their sophomore or junior year of high school (Princeton Review, 2022), which may be before they experience critical academic preparation in their senior year. Therefore, it is a logical conclusion that students who were placed into ENGL 111 by Accuplacer, EdReady English, and PSAT had similar levels of academic preparedness, which might have been lower than students in other placement groups.

EdReady English

The focus of this study was the placement accuracy of EdReady English and the ENGL 111 grade outcomes of students placed by this assessment compared to all other placement methods. Overall, students who were placed into ENGL 111 by EdReady English had grade outcomes comparable to all other placement methods. A Kruskal-Wallis H test showed no statistically significant differences in the median grades of students placed by EdReady English compared to all other methods except HSGPA. The average grade in ENGL 111 for all students in the study was a C, and students placed by EdReady English also had a median grade of C. This suggests that students who are placed by EdReady English perform comparably to students of other placement methods. Students placed by the co-requisite model had lower median grades than students placed by EdReady English, and students who took Accuplacer and the PSAT had the same median grades as students who took EdReady English. Since EdReady students fared no better or worse than students placed by Accuplacer or PSAT, it is likely that EdReady English is as accurate a measure of readiness as these two methods. It could also be a signal that students who take Accuplacer, PSAT, and EdReady English have similar levels of academic preparedness.

Although EdReady English students did as well or better than students placed by the co-requisite, PSAT, or Accuplacer, they did not do as well as students placed by previous degree or coursework, HSGPA, remedial coursework, SAT, or ACT. Students who were placed into ENGL 111 by previous coursework, remedial coursework, HSGPA, SAT, and ACT performed slightly better in ENGL 111

than students placed by EdReady English. These placement methods had a median grade of B. Students who placed into ENGL 111 using a previous degree had a median grade of A. It is not necessarily appropriate to compare students who take EdReady English with students who have already earned a degree since students taking EdReady English are often first-time students at the LMCCS. Additionally, only 10 students in the study were placed by remedial courses, so it would be appropriate to be cautious in making comparisons to the 500 students in the EdReady English group. Therefore, a takeaway from this study is that students placed by EdReady English performed the same in the first credit-bearing English class as students placed by co-requisite, PSAT, or Accuplacer, but they did not perform as well as those placed by previous coursework, HSGPA, SAT, or ACT. However, these differences were not found to be statistically significant, except for the group placed by HSGPA. This suggests that EdReady English is an appropriate placement method since students in the study performed similarly to PSAT or Accuplacer. However, because students of different placement methods outperformed students placed by EdReady English in ENGL 111, it may be that students who take EdReady English have lower levels of academic preparedness than students who were placed by previous coursework, HSGPA, SAT, or ACT.

Until spring 2020, the LMCCS used Accuplacer as its primary placement method for students who could not provide other placement data like HSGPA, ACT, PSAT, or SAT scores. Therefore, it is important to compare the outcomes of students placed by EdReady English to those of students placed by Accuplacer to determine if EdReady English has similar accuracy rates as the previous placement test used at the LMCCS. Both placement groups had a median ENGL 111 grade of C. Students who placed using Accuplacer had a success rate of 54.17%, defined as a C or higher in ENGL 111; by contrast, students placed by EdReady English had an ENGL 111 success rate of 56.2%. Additionally, students placed by EdReady English had a lower withdrawal rate, 11.60%, than students placed by Accuplacer, who had a 16.67% withdrawal rate. The higher success rate and lower withdrawal rate of EdReady

English compared to Accuplacer suggests it may be a more accurate placement method. However, students placed by EdReady English had a higher failure rate, 41%, than students placed by Accuplacer, 37.5%. These nuances may explain why the regression analysis calculated no statistically significant differences in the grades of these two groups. While students placed by EdReady English performed better in ENGL 111 on most metrics, they fell behind Accuplacer in failure rates. This suggests EdReady English students performed slightly better in ENGL 111 if one only considers success rates, but the difference is not statistically significant. EdReady English students performed slightly worse than students placed by Accuplacer if one only considers failure rates, but the difference is also not statistically significant. Therefore, it can be concluded that the switch from Accuplacer to EdReady English at this campus of the LMCCS did not result in reduced placement accuracy given that students performed comparably well in ENGL 111 when placed by both methods.

An important finding of this study is the statistically significant difference in the ENGL 111 grades of students placed by EdReady English and those placed by HSGPA. This reinforces previous studies which found that HSGPA is a more accurate predictor of student success than most placement tests (Belfield & Crosta, 2012; Elliot et al., 2012; James 2006; Medhanie, 2012; Ngo & Melguizo, 2016). Students placed by HSGPA had a 71.4% success rate in ENGL 111 compared to students placed by EdReady English, which had a success rate of 56.2%. Students who placed into ENGL 111 using HSGPA had a significantly lower failure rate, which was defined as an F, FW, or W, than students who took EdReady English. 41% of students who placed by EdReady English failed the class, but only 23.88% of students who placed by HSGPA failed the course. Students who earned an F only were very similar for both groups; 8% of students in the EdReady group earned an F compared to 7% of students in the HSGPA group. However, students who placed into ENGL 111 using EdReady English had a much higher FW rate, 22%, compared to those who placed by high school GPA, 10%. Finally, students who got into

ENGL 111 using HSGPA had only a 6.97% withdrawal rate compared to students who entered ENGL 111 through EdReady English, which had almost double the withdrawal rate, 11.60%.

These results suggest HSGPA is a more accurate predictor of students' success in ENGL 111 than EdReady English. There are several reasons why this may be the case. For example, students' HSGPA reflects their academic competency in several subjects across many years (Allensworth & Clark, 2020). HSGPA may also reflect affective student issues like motivation and effort (Belfield & Crosta, 2012; Bowen et al., 2009). EdReady English, while it allows students the opportunity to raise their score in the Study Path, may function more like a single-score placement test for some students. This is because 85% of EdReady scores in the study were 70, 71, or 72. If students take the EdReady diagnostic test and earn a passing score the first time, the test may essentially function as a single-score method like the ACT or SAT. This could be one reason why students who are placed into ENGL 111 by EdReady English do not perform as well in ENGL 111 as those placed by HSGPA. Previous studies have noted the limitations of using single-score methods to measure students' academic proficiencies (Brathwaite & Edgecombe, 2018; Saxon & Morante, 2014). This is one potential explanation for the differences in ENGL 111 outcomes between students placed by EdReady English and HSGPA. Another possible explanation is that students placed by HSGPA have higher levels of academic preparation than students placed by EdReady English. At the LMCCS, students can place directly into ENGL 111 with a HSGPA of 2.6 or higher. It is therefore likely that students who had lower GPAs and did not have passing scores on the ACT or SAT used EdReady English as their placement method. This would support the assertion that students who placed into ENGL 111 using EdReady English had lower levels of academic preparation than students who used their HSGPA.

The purpose of this study was to examine how the newly adopted EdReady English tool functions as a placement test at one campus of a LMCCS, how the students placed by this metric

performed in ENGL 111 by subgroup, and how students who used this assessment performed in ENGL 111 in comparison to other placement methods. This study found no relationship between a student's EdReady English score and their grade in ENGL 111. Students with higher EdReady scores did not have corresponding higher grades in ENGL 111, and no EdReady English score was predictive of a particular grade in ENGL 111. This suggests the predictive validity of EdReady English is low, but this is not surprising given that previous studies have found that English placement tests typically have a poor ability to predict students' success in the first credit-bearing English course (Elliot et al., 2012; James, 2006; Medhanie et al., 2012; Scott-Clayton et al., 2014). The study found that students who were placed into ENGL 111 by EdReady English had no grade differences by race or gender, but students ages 14-19 performed worse in ENGL 111 than students ages 32 and up. This suggests EdReady English places students equitably across race and gender subgroups because there are no statistically significant ENGL 111 grade outcomes for students in these subgroups. The lower median grades of students in the 14-19 age group suggest either that students in this group may be misplaced into ENGL 111 when they are not prepared for the class or that younger students may have lower levels of academic preparedness than students who are ages 32 and up. Finally, students who were placed by EdReady English had similar or improved grade outcomes than students placed by the co-requisite model, PSAT, or Accuplacer, suggesting that EdReady English places students as well as these methods or that students in these placement groups have similar levels of academic preparation. Students who were placed into ENGL 111 using EdReady English did not perform as well as students placed by previous coursework or degree, ACT, SAT, or HSGPA, but most differences were not statistically significant, suggesting that EdReady English students perform as well as students placed by most other methods except HSGPA. This study found that HSGPA was a more accurate predictor of success in ENGL 111 than EdReady English. The

findings could also indicate that students who were placed using HSGPA had higher levels of academic preparation than students who were placed using EdReady English.

Impact of the Study

This study contributes to the field by providing data on the use of EdReady English, a new placement tool being adopted at colleges like Jackson State University, Nevada State College, and the LMCCS that is the focus of the study. There is no extant research on the accuracy of the EdReady English placement test; all current studies have focused on EdReady Math (Hendrata et al., 2020; Methvin & Markham, 2015; The NROC Network, 2016; The NROC Network, 2019; Thornton et al., 2019). Additionally, previous studies of EdReady Math did not examine the connection between students' scores on EdReady and their performances in the first credit-bearing course. By examining this relationship, the current study fills a gap in the research not only on EdReady English, but also on the strength of the relationship between the EdReady score and a student's grade in the first-year English course. Previous studies on EdReady have considered the success of the placement method by examining the percentage of students who used EdReady to bypass remediation (Hendrata, 2020; Nevada System of Higher Education Office of Academic and Student Affairs, 2019; The NROC Network, 2016; Thornton et al., 2019) or the student passing rates in college-level courses alone (The NROC Network, 2019; Thornton et al., 2019). This study demonstrated that the EdReady English score had a weak relationship to a student's grade in the first credit-bearing English course, which is a finding similar to other studies on English placement tests (Elliot et al., 2012; James, 2006; Medhanie et al., 2012; Scott-Clayton et al., 2014). This study contributes to the field by demonstrating no linear relationship between the EdReady English score and the grade in the first credit-bearing English course, calling into question the predictive value of the metric. The study also found that students who were placed into ENGL 111 using EdReady English did not have statistically significant differences in English grades

compared to students who were placed using other methods. This fills a gap in the research by showing that EdReady English is comparable to all other placement methods except HSGPA in terms of ENGL 111 grade outcomes. The results of this study confirm previous research that HSGPA is a more accurate predictor of student success in a first-year course than standardized placement tests (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Belfield & Crosta, 2012; Bowen et al., 2009; Geiser et al., 2007; Koretz et al., 2016; Scott-Clayton, 2012; Zwick & Sklar; 2005). Although EdReady English was found to be a less accurate placement method than HSGPA, it was found to be comparable to other placement methods at this campus of the LMCCS.

Additionally, this study contributes to the field by examining the grade outcomes of students placed by EdReady English by student subgroups, analyzing the equitable outputs of the measure. Previous studies looked at the aggregated outcomes of students placed by EdReady Math, showing that students using this method were able to reduce time in remediation and perform well in the first credit-bearing course (Hendrata, 2020; Nevada System of Higher Education Office of Academic and Student Affairs, 2019; The NROC Network, 2016; The NROC Network, 2019; Thornton et al., 2019). This study considered not only the grade outcomes of students placed by EdReady English, but also their results by subgroup, including age, race, and gender. Previous studies have found differences in the outcomes of placement tests among racial groups (Kurlaender & Larsen, 2013; Klasik and Strayhorn, 2018). This study found no statistically significant differences in the ENGL 111 grades of students placed by EdReady English by race or gender. Statistically significant differences were found between students ages 14-19 and students ages 32 and up, demonstrating that younger students who are placed into the first credit-bearing English course by EdReady English may need additional support to be successful in the class. This finding contributes to the field by showing that students who use EdReady English to place into their first credit-bearing English course have equitable outcomes by race and gender. Previous studies

did not explore the grade outcomes of students placed by EdReady by subgroup, but the current study demonstrates that some subgroups, such as race and gender, have equitable grade outcomes when placed by this metric, while other subgroups, such as age, may have heterogeneous results.

Implications for Practice

This study fills a hole in the research on placement testing by providing an analysis of the use of EdReady English as a placement test at one campus of a statewide community college system. The most significant contribution of this study is data about the outcomes of students placed into their first credit-bearing English course by EdReady English and the relationship between the EdReady English score and students' grade in their English course. Current research on EdReady focuses on math only, so this study fills a gap in the research by providing policymakers with data about the use of EdReady English as a placement tool. In addition to the LMCCS that was the focus of this study, Nevada State College and Jacksonville State College have also adopted EdReady as a placement tool, according to The NROC Network (Meet students where they are, n.d.). It is possible that other colleges may want to explore using EdReady as an adaptive, low-stakes placement option. As test-optional and test flexible policies become more popular at colleges nationwide (Backstrom & Schultz, 2022; Hoover, 2021; Marcus, 2021), institutions may consider EdReady as an alternative to traditional proctored tests. The results of this study can be used to advise stakeholders who are interested in gathering data on the use and outcomes of EdReady English as a placement test.

This study found that students placed by EdReady English performed comparably well in their first credit-bearing English course as students placed by all other methods except HSGPA. Additionally, there were not statistically significant differences in the ENGL 111 grades of student subgroups placed by EdReady English by either race or gender, suggesting the tool may be an equitable placement for these groups. The similarities in the success and failure rates of EdReady English and Accuplacer suggest

these two methods are at least comparable in their accuracy. However, EdReady English does not require proctoring, and students can raise their score by working through the Study Path. This gives EdReady English an advantage over Accuplacer. Because students placed by EdReady English have equitable grade outcomes by race and gender, and students placed by EdReady English performed as well in their first credit-bearing English course as students placed by other methods, it may be an appropriate alternative to traditional placement tests or an acceptable addition to a multiple measures placement policy.

Although the study did not find statistically significant differences in the ENGL 111 grades of EdReady students by race or gender, there were differences in the grades of students ages 14-19 and students 32 and up. The study found that students in the lowest age group had significantly lower grades in ENGL 111 than students ages 32 and up. This suggests that EdReady English may not be as accurate for students in the youngest age group or that students in this group have lower levels of academic preparation. A potential implication of this finding is that students ages 14-19 who place into the first credit-bearing English course using EdReady English may need additional academic support. These students may need to spend more time honing their skills in the EdReady Study Path, or they may need additional tutoring or coaching to be successful in the class. This information can also be used to help advisors have conversations with their students about class placement. For example, students in the lowest age bracket may be advised to complete all the modules in their Study Path before beginning their first credit-bearing English class. Knowing that students ages 14-19 had lower grades in the first credit-bearing class when they placed using EdReady English may also help stakeholders who are deciding if EdReady English is a good fit for their campus. It is possible that EdReady English may not be the best fit for campuses with a large population of students in this younger age group.

This study reinforced the finding that high school GPA is a strong predictor of student success (Allensworth & Clark, 2020; Atkinson & Geiser, 2009; Belfield & Crosta, 2012; Bowen et al., 2009; Geiser et al., 2007; Koretz et al., 2016; Scott-Clayton, 2012; Zwick & Sklar; 2005). Students who were placed by HSGPA into ENGL 111 outperformed students who were placed by EdReady English by every metric, including success rates, failure rates, and withdrawal rates. These results were statistically significant, suggesting that HSGPA is a more accurate predictor of student success than EdReady English. It may also suggest that students placed by EdReady English have lower levels of academic preparedness than students placed by HSGPA This information can help policymakers decide which English placement methods to offer or prioritize. For example, a high school transcript may be a preferred English placement method over EdReady English. Additionally, it may be that students who are placed into their first credit-bearing English class by EdReady need additional academic support, tutoring, or coaching to be successful in the course.

Because students may not have access to their transcripts, placement options like EdReady English may still be a part of many colleges' placement policies. However, this study found no relationship between a student's EdReady English score and their grade in ENGL 111. This finding coincides with previous research that found a weak relationship between English placement test scores and students' grades in the first credit-bearing English course (Elliot et al., 2012; James, 2006; Medhanie et al., 2012; Scott-Clayton et al., 2014). If there is not a strong relationship between students' scores on EdReady English and their grades in ENGL 111, the test may not be necessary. After all, the validity of a placement test is rooted in its ability to predict the performance of the students whose aptitude it measures (American Educational Research Association et al., 2014; Armstrong, 1999; Medhanie et al., 2012). If the EdReady English score does not correlate to students' grades in the first credit-bearing English course, it is not truly predictive of students' academic readiness. However, it may serve as an

alternative placement with similar accuracy as other placement methods, excluding HSGPA. Policymakers may want to consider eliminating the placement test requirement altogether. When Florida did this, passing rates in the first credit-bearing English class rose, and the achievement gap among racial groups significantly narrowed (Park et al., 2018). Not only are colleges across the country eliminating placement tests anyway (Backstrom & Schultz, 2022; Hoover, 2021; Marcus, 2021), but it is possible that placing all students directly into college-level English would result in fewer placement errors (Belfield & Crosta, 2012; Scott-Clayton, 2012). If placement tests are a critical part of a college's course placement strategy, EdReady English is comparable to other methods. However, since the relationship between the EdReady English score and the ENGL 111 grade is weak, it may be appropriate to consider allowing students to self-place or to eliminate the placement requirement altogether.

The results of this study suggest students who are placed using certain methods may need additional support in ENGL 111, the first credit-bearing English course. For example, students who placed using EdReady English and the SAT had the highest FW rates, indicating students failed the class because they stopped attending. Students who are placed using these methods may need additional academic support through tutoring or coaching. Advisors may also wish to explain campus withdrawal procedures to students who place into ENGL 111 using these methods. It could be that students placed by EdReady English or SAT are unaware of campus resources or the steps to follow when they start to struggle in a class. Additionally, students who placed into ENGL 111 using Accuplacer or PSAT had the highest withdrawal rates in the study. It may be that students who place using these methods also need additional academic supports like tutoring or coaching to be successful in ENGL 111. One possible implication is that advisors could emphasize available campus resources for students who are placed into ENGL 111 using Accuplacer or PSAT.

This study found that 85% of students who placed into ENGL 111 using EdReady English had a score of 70, 71, or 72. This suggests that most students who are using this method to place into ENGL 111 have only mastered 70-72% of the material. Although the grades of students who placed into ENGL 111 using EdReady English were not statistically significant from other placement methods except high school GPA, 41% of students placed by EdReady English failed the course by earning an F, FW, or W. This high failure rate suggests many students who placed into ENGL 111 using EdReady English were not sufficiently prepared academically for the course. One implication for policymakers is to raise the cut score. It could be that a score of 70 does not represent sufficient mastery of the material. Another suggestion is for advisors to encourage students to complete all of the Study Path before enrolling in ENGL 111. Additionally, campuses could provide more coaching and tutoring for students who are taking EdReady English or are working in the Study Path. High ENGL 111 failure rates suggest students who are using EdReady English may need additional academic support in the class.

Limitations

One of the biggest limitations of the study was the COVID-19 pandemic. During March 2020, the LMCCS campuses were closed, and all classes were delivered virtually. It wasn't until Fall 2021 that classes returned to the traditional, face-to-face format. Therefore, it is unknown how the changes to the course modality from face-to face to virtual and back impacted the ENGL 111 grades of students in the study. Additionally, the COVID pandemic brought seismic changes into the lives of students because of health, work, and family changes and loss. It is unclear how the challenges of the COVID-19 pandemic affected students in this study. Because of pandemic shutdowns, many SAT and ACT testing centers were closed (Backstrom & Schultz, 2022; Hoover, 2021; Marcus, 2021), which could have impacted the placement methods of students in the study. For example, students who placed into English 111 using EdReady English may have done so because they were unable to take the SAT or ACT.

Availability of demographic data limited the scope of student subgroups that could be explored in RQ2, which examined the ENGL 111 grades of students who were placed by EdReady English by age, race, and gender. The demographic information examined in this study is required on all students' admissions applications at the LMCCS. However, other useful data, such as students' socioeconomic status, the highest level of parents' education, high school attended, and number of AP or honors courses taken in high school, could also shed light on potential differences in ENGL 111 grade outcomes. This data is not collected by the LMCCS, and financial information is typically collected only for Pell Grant recipients who receive federal financial aid. Pell Grant recipients were not specifically examined in this study because socioeconomic information is unknown for all other groups. It is possible for a student to qualify for a Pell Grant and not apply; therefore, conclusions drawn from examining the students in the Pell Grant subgroup compared to students who did not receive Pell Grants could be inaccurate. Finally, because the LMCCS only collects data on two gender categories, male and female, the outcomes of students placed by EdReady English are unknown for any other gender identities.

Another limitation of the study was the small sample sizes of students who placed into ENGL 111 using the co-requisite model and stand-alone remediation. Each group had only 10 students. This study showed students who took stand-alone remediation had higher success rates, 70%, than students in the co-requisite model, 40%. This comparison represents seven students versus four, so conclusions about each model can only be made cautiously. More data on both placement methods will need to be gathered to get a more accurate picture of the outcomes of students who are placed using these methods. Previous studies have found that students who are placed using the co-requisite model are more likely to pass the first credit-bearing English course than students who take stand-alone remediation (Cho et al., 2012; Jaggars et al., 2015; Ran et al., 2022). The current study did not support these findings, but the small sample sizes were a clear limitation for these two placement methods.

Recommendations for Future Research

This study uncovered overall low success rates in ENGL 111 for all students at this campus of the LMCCS. 64.50% of students from all placement methods in the study earned a C or higher in the class. Students who placed by previous degree or coursework or HSGPA had the highest success rates while students who placed by co-requisite, Accuplacer, and EdReady English had the lowest. It is unknown why so many students at this campus of the LMCCS did not pass ENGL 111. Future research could examine the cause of low success rates to determine if student academic preparation, course rigor, student affective issues, lack of academic support, impacts of the COVID-19 pandemic, or other causes contribute to low success rates in ENGL 111. Additionally, students of all placement methods had very low percentages of Ds in ENGL 111. In fact, this was the least frequent grade in the study. The highest percentage of Ds were in the co-requisite, Accuplacer, and ACT placement groups. The low rate of Ds is worth further study, particularly if it could be determined why so many students failed the course instead of earning a D. It may also be useful to consider the grade outcomes of dual credit students to determine if their success rates were comparable to those in the study.

Because COVID-19 lockdowns caused campuses to make all classes virtual, some of the classes in this study were offered virtually while others were face-to-face. Additionally, the LMCCS also offers classes online in an asynchronous format. It is possible that students using different placement methods have varying levels of success in ENGL 111 (Bourdeau et al., 2018). Future research could examine if course modality affects the grades of students by placement method. It is also worth exploring if students who are placed into ENGL 111 by EdReady English have varying grade outcomes by course modality. For example, it could be that students placed by EdReady English have more success in one course format than another. These results could be examined by subgroup to determine if grade

differences by student subgroup, including age, race, and gender, are present in different course modalities.

Another area for future research is the EdReady English Study Path. It is unknown if time spent in the Study Path is correlated with higher grades in the first credit-bearing English course. For example, it is possible that students who spend more time in the Study Path earn higher grades in ENGL 111. It is also unknown if the outcomes of spending time in the Study Path vary by student subgroup. It may be that the Study Path is more beneficial for some student subgroups than others. It may also be useful to examine which areas of the Study Path most students are assigned. This may indicate the areas of academic weakness many students experience. Again, this could also vary by student subgroup. A more in-depth analysis could explore which assigned modules of the Study Path, if any, are more closely aligned with success in ENGL 111. More broadly, the content validity of the Study Path should be examined in relationship to the ENGL 111 course. Since this study found no relationship between the EdReady English score and a student's grade in ENGL 111, it is possible that the content of the EdReady diagnostic test, which reflects the content of the Study Path, does not align well with the ENGL 111 course content at this campus of the LMCCS.

Future research could be done to explore how students use the EdReady English Study Path and the outcomes of students who do not complete it. All the students in this study enrolled in ENGL 111, but there may be students who took the EdReady diagnostic test and did not enroll in ENGL 111. Additionally, some students may have decided to enroll in remediation or co-requisite courses instead of working through the Study Path. There may also be students who were given instructions to take the EdReady English test, but they never started it. It is important to consider the outcomes of these students. For example, some students may not have worked in the Study Path after taking the initial diagnostic test; others may have chosen not to enroll in ENGL 111 until a later time. This study revealed

that 85% of students who took the EdReady English test had a final score of 70, 71, or 72. This suggests that students may not be working in the Study Path after they reach the cut score. Future research could focus on why and how students utilize the Study Path after taking the initial diagnostic. If there are students who take the EdReady English test but choose not to work in the Study Path, it would be important for future research to uncover why students may not persist. It would also be important to examine outcomes by student subgroup, such as age, race, gender, and even socioeconomic status. Specifically, if there is a subsection of students who takes the EdReady English diagnostic test, does not meet the cut score, but does not use the Study Path to raise the score, it would be important to identify such a group.

Future qualitative research on EdReady English could also uncover useful information about how students experience EdReady English and what guides their choice to engage with the tool. For example, more African American students placed into ENGL 111 using EdReady English than other placement methods. Future research could explore the reasons why this occurred and if the overrepresentation of Black students in the EdReady group was a result of COVID-19 closures, the ease and convenience of the tool, or some other explanation. This study also revealed that students in the youngest age group, 14-19, had low median scores in ENGL 111. Interviews or case studies may uncover the unique challenges this group faced and if the students felt academically prepared for the course. Future research could also build on the work of Venezia et al. (2010), which explored students' experiences and perceptions of placement tests in California using interviews. Future research could involve interviewing students placed by EdReady English to clarify the reasons so many do not pass ENGL 111. Perceptions of EdReady English could also be explored by student subgroups such as age, race, or gender. Although this study found no significant differences in ENGL 111 grades by race or gender, there may still be variations in the way students in different subgroups experience the test.

This study explored the relationship between students' EdReady English scores and their grades in ENGL 111. However, future research could explore the relationship between students' scores on other placement tests and their grades in ENGL 111. It is unknown, for example, if higher scores on the ACT, PSAT, or ACT are related to higher grades in ENGL 111. It is also unclear if higher HSGPAs are related to higher ENGL 111 grades. Previous research has found that HSGPA is predictive of student success, and the current study supported these results. However, the relationship between initial placement metrics, such as a score, and a student's grade in ENGL 111 has not been studied. The current study found no relationship between the EdReady English score and grades in ENGL 111, but that could also be the case for other placement methods. It is certainly possible that other placement methods have a stronger relationship with the ENGL 111 grade. Like the current study, future research could examine initial placement method scores and ENGL 111 grades by subpopulation to determine not only if a relationship exists, but if ENGL 111 grades vary by subpopulation. This could determine if students placed by other methods such as Accuplacer, ACT, PSAT, and ACT have similar ENGL 111 grades by subgroup like age, race, and gender. The results of such research could help policymakers determine which placement methods are most accurate and equitable for the first-year English course. This could also help decision makers determine which English placement methods to prioritize at schools that utilize multiple methods policies.

Because EdReady English was recently adopted by the LMCCS, more research must be done to determine its impact at each of the 19 campuses. Student demographic data and campus-specific details could impact the accuracy and outcomes of the tool. Previous research on placement tests has supported the need for individual campuses to test placement metrics with their own unique populations (Coleman & Smith, 2020; Ganga & Mazzariello, 2019; Horn et al., 2009; Melguizo et al., 2014). Although the current study found no statistically significant differences in ENGL 111 grades by

race or gender, such differences could exist at other campuses. Likewise, the current study found differences in ENGL 111 grades of students ages 14-19 and 32 and up, but differences by various age categories may exist at other campuses. Although the current study found no relationship between the EdReady English score and a student's grade in ENGL 111, a stronger relationship could exist in populations at other campuses of the LMCCS. Future research could explore the usefulness of EdReady English in different contexts, and results could be compared to determine if there are campuses where EdReady English has a bigger impact on students' success rates in ENGL 111.

Because EdReady English was adopted in March 2020, long-term student outcomes are still unknown. Most students who placed into ENGL 111 in March 2020 will start to be eligible for graduation in spring or fall 2022, so their outcomes are unknown at the time of this study. A longitudinal study of the cumulative GPAs, graduation rates, and completion metrics of students placed by EdReady English will give a more robust picture of the impact of this placement method on student success. These long-term outcomes can be compared to those of students placed by other methods to generate a broader view of student performance and persistence by placement method. Future research can also explore the long-term outcomes of EdReady English students compared to students who took stand-alone remediation. This may help college leaders determine if students who bypass remediation by working through the EdReady English Study Path experience long-term success. A longitudinal study of EdReady English students' grades in ENGL 111 could also generate useful data about success rates and failure rates. Because the data for this study was collected during the COVID-19 pandemic, it will be critical to continue collecting data on the outcomes of students placed by EdReady English to determine any changes in placement accuracy.

Conclusion

The open access policies of community colleges make them potential spaces for equity and opportunity within the communities they serve. Community colleges must balance protecting the academic rigor of their courses while providing an appropriate placement for all students who enter their doors. Placement tests have long been used to fill this role, identifying students who are ready for college-level courses and those who need remediation. EdReady English is a new tool that could improve the current process by providing placement and remediation in a convenient, low-stakes delivery method. The current study shows that students who are placed by EdReady English perform as well as students placed by most other placement methods in their first credit-bearing English course, demonstrating that it is a promising alternative to traditional high-stakes tests like Accuplacer and PSAT. These proctored tests create an undue burden for many student populations, blocking their access to higher education. The current study suggests students who are placed by EdReady English have similar outcomes in their first credit-bearing English class by race and gender, demonstrating that this method may work equitably for student subgroups. However, as more colleges adopt test-optional policies, the relationship between placement scores and students' performances in college-level courses has fallen under greater scrutiny. In terms of placement accuracy, EdReady English was found to be as accurate as other English placement tests at this campus of the LMCCS. Problematically, EdReady English, like most English placement tests, appears to have little predictive value. If an English placement test must be used, EdReady English appears to be as effective as nearly any other; however, the weak relationship between the EdReady score and English grade challenges its accuracy. As colleges across the country bid adieu to placement tests, it may be time for community colleges to do the same. If there is no predictive value in the placement test, it may serve as an unnecessary barrier to college access.

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Appendices

Appendix A:

Age Frequency of Students Placed by EdReady English into ENGL 111 (2020-2022)

Age	Frequency	Percent	Valid Percent	Cumulative Percent
14	1	.2	.2	.2
15	2	.4	.4	.6
16	1	.2	.2	.8
17	11	2.2	2.2	3.0
18	67	13.4	13.4	16.4
19	52	10.4	10.4	26.8
20	24	4.8	4.8	31.6
21	19	3.8	3.8	35.4
22	23	4.6	4.6	40.0
23	23	4.6	4.6	44.6
24	29	5.8	5.8	50.4
25	21	4.2	4.2	54.6
26	16	3.2	3.2	57.8
27	16	3.2	3.2	61.0
28	21	4.2	4.2	65.2
29	15	3.0	3.0	68.2
30	19	3.8	3.8	72.0
31	16	3.2	3.2	75.2
32	10	2.0	2.0	77.2
33	11	2.2	2.2	79.4
34	11	2.2	2.2	81.6
35	12	2.4	2.4	84.0
36	5	1.0	1.0	85.0
37	9	1.8	1.8	86.8
38	6	1.2	1.2	88.0
39	7	1.4	1.4	89.4
40	3	.6	.6	90.0
41	8	1.6	1.6	91.6
42	5	1.0	1.0	92.6
43	5	1.0	1.0	93.6
44	3	.6	.6	94.2
45	1	.2	.2	94.4
46	5	1.0	1.0	95.4
47	2	.4	.4	95.8

Age	Frequency	Percent	Valid Percent	Cumulative Percent
48	5	1.0	1.0	96.8
50	4	.8	.8	97.6
51	1	.2	.2	97.8
52	3	.6	.6	98.4
53	2	.4	.4	98.8
54	2	.4	.4	99.2
57	2	.4	.4	99.6
58	1	.2	.2	99.8
59	1	.2	.2	100.0
Total	500	100.0	100.0	

Appendix B:

EdReady English Table of Contents

EDREADY ENGLISH TABLE OF CONTENTS

EdReady Powered by NROC

Unit 1: Introduction to College Reading and Writing

READING:

- Author, Audience, and Purpose
- Fact and Opinion
- Using Context Clues
- Identifying Word Parts
- Topic Sentences

WRITING

- Topic Sentences
- Revising, Editing, and Proofreading

GRAMMAR

- Subjects and Verbs
- Prepositional Phrases
- End Punctuation

Unit 2: Identifying Main Ideas

READING

- Stated Main Ideas
- Supporting Details
- Using Context Clues
- Identifying Word Parts

WRITING

- Developing a Thesis Statement and Supporting Ideas

GRAMMAR

- Run-on Sentences
- Comma Splices
- Sentence Fragments

Unit 3: Discovering Implied Meaning

READING

- Author's Point of View and Cultural Context
- Implied Main Ideas
- Major and Minor Supporting Details
- Using Context Clues
- Identifying Word Parts

WRITING

- Developing an Implied Thesis Statement and Topic Sentences
- Coherence

GRAMMAR

- Subject-Verb Agreement
- Past, Present, and Future Tense

Unit 4: Interpreting Bias

READING

- Making Inferences and Drawing Conclusions
- Outlining a Reading
- Faulty Parallel Structure
- Using Context Clues
- Identifying Word Parts

WRITING

- Using Transitional Words and Phrases

GRAMMAR

- Commas with Introductory Phrases
- Commas with Transitions
- Adjectives and Adverbs

Unit 5: Analysis through Definition

READING

- Identifying Denotation and Connotation
- Identifying Types of Definitions
- Recognizing Objective and Subjective Language
- Using Context Clues
- Identifying Word Parts

WRITING

- Creating an Effective Introductory Paragraph for an Essay
- Understanding the Four Sentence Types

GRAMMAR

- Comma Use in a Series
- First-, Second-, and Third-Person Pronouns

Unit 6: Learning Across Disciplines

READING

- Understanding Reading and Writing Differences Across Disciplines
- Using Context Clues
- Identifying Word Parts

WRITING

- Developing Support in an Analysis Essay
- Creating an Effective Conclusion for a Multiparagraph Essay

GRAMMAR

- Coordinating and Subordinating Conjunctions
- Commas with Relative Pronouns
- Apostrophes

Unit 7: Exploring Comparative Elements

READING

- Identifying a Comparison Made in a Reading
- Figurative Language
- Using Context Clues
- Identifying Word Parts

WRITING

- Developing a Thesis for a Compare and Contrast Essay
- Developing an Outline for a Compare and Contrast Essay
- Figurative Language

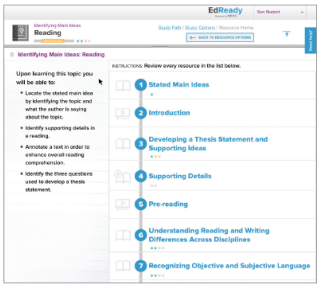
GRAMMAR

- Commonly Confused Words
- Parenthetical Expressions
- Mistakes with Modifiers
- Active and Passive Voice

Unit 8: Informed Opinions through Causal Chains

READING

- Listing Causes and Effects in a Reading
- Logical Fallacies and Causal Relationships
- Using Context Clues
- Identifying Word Parts



Media-rich and diverse exercises help students acquire essential skills.

WRITING

- Responding Effectively to Essay Assignments

GRAMMAR

- Numbers
- Semicolons, Colons, and Commas

Unit 9: Applied Critical Analysis

READING

- Recognizing the Main Idea and Source Bias in a Complex Reading
- Evaluating Credible Sources Used Within a Reading
- Logical Fallacies and Analysis
- Using Context Clues
- Identifying Word Parts

WRITING

- Using Effective Evidentiary Support
- Paraphrasing vs. Direct Quotations
- Blending Source Material into an Essay

GRAMMAR

- Creating Concise Sentences
- MLA Citation Styles

Unit 10: Using Sources in Critical Reading and Writing

READING

- Restating Different Viewpoints
- Using Context Clues
- Identifying Word Parts

WRITING

- Finding and Evaluating Sources
- Evidentiary Support
- Avoiding Plagiarism
- Formatting a College Essay – APA Style

GRAMMAR

- Capitalizing Words and Punctuating Titles
- Quotation Marks
- APA Citation Styles