

Measuring the Effectiveness of Critical Literacy as an Instructional Method

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ABSTRACT

This paper reports the results of a quasi-experiment investigating the efficacy of using critical literacy as an instructional method. Using a quantitative comparison method, critical literacy is the study's treatment. The treatment measures the final exam scores of linguistically diverse urban community college students enrolled in college developmental reading courses against 13 other statistically similar classes. The primary data are the results of a standardized final exam. This quasi-experimental study demonstrates the effectiveness of a critical literacy model when employed in a community college setting. Further, this study introduces a quantitative rationale for using critical literacy and establishes the practice as a highly effective method of instruction for postsecondary developmental reading courses.

Unfortunately, traditional developmental reading curriculum and instruction have not addressed issues of race and social class and the impact they have on the educational experiences and outcomes of African Americans from disadvantaged backgrounds. Increasingly, researchers are calling for a critical race perspective in theory, research, and practice related to African American college students. . . . Specific to issues of literacy, several theorists and researchers emphasize the value of sociocultural theory and critical literacy in meeting the increasingly diverse literacy needs of students. (Williams, 2012, p. 36)

Introduction and Literature Review

Williams (2009, 2012) noted the complexity that developmental reading courses present in a community college

curriculum. In particular, Williams called for different forms of pedagogy to meet the evolving needs of an increasingly diverse developmental reading population. Williams positioned her work at the crossing of college

developmental reading and critical literacy. Deploying both critical theory and critical ethnography, Williams spoke directly to the needs of postsecondary reading. Her works' implications provided a type of instructional method that teachers of developmental reading classrooms might readily employ. Essentially, Williams detailed the ways that college reading could be taught by situating relevant texts into the postsecondary curriculum. She hybridized culturally relevant material with the rigors of the college reading classroom, availing new learning opportunities for her students.

However, Williams's work may be discounted in an age of quantification. Lang and Baehr (2012) noted that college literacy research tends to be controlled by primarily qualitative studies. Additionally, Lang and Baehr detailed that quantitative research often meets opposition. As a result, researchers and instructors in college reading courses may be reliant on research methods that preclude quantification.

Although Lang and Baehr's (2012) literacy research primarily concerned writing, their argument is centrally important to college reading. Williams's (2009, 2012) critical literacy work could be discounted as "lore, anecdotal evidence, or studies relying on small sample sizes to defend our assertions" (Lang & Baehr 2012, pp. 173–174). Lang and Baehr's critique of the avoidance of quantitative techniques should not, however, be viewed as a call for only positivistic and quantitative methods. Ziegler and Lehner (2016) reviewed Denzin and Lincoln's (2011) scholarly assessment of positivism in the social sciences but did not altogether understand how such critiques can apply to college literacy programs.

Before unfolding this investigation on critical literacy, we underscore that this study seeks to expand Williams's (2009, 2012) work by providing a quantitative rationale for the practice of critical literacy in the college reading classroom.

Review of Criticality

This paper explores critical literacy scholarship, informed by previous research in this area. Chall (1983) contended that students make a shift in learning-to-read metaprocesses when they transition from learning to read to reading to learn. Chall's notion of the learning-to-read meta-processes aligned with Rosenblatt's (1988) conception of transactional reading. Rosenblatt developed the notion of transactional reading, in which students are aesthetically engaged in a text. Rosenblatt claimed that this type of aesthetic engagement leads students to more fully explore their readings.

In critical pedagogy, Freire (1970/1993) conceptualized that instructors need to situate their teaching in the lived experiences of students. This type of instruction afforded students the opportunity to construct new knowledge and develop a sense of critical consciousness. In this tradition, researchers have contended that students need to situate new textual information in order to apply this knowledge to their lives. From a different yet epistemologically related conceptual framework, the work of Gee (1989) and Street (2003) added to Freire's theory of critical pedagogy. Their work is referred to as "new literacy studies." Together, Gee's and Street's work encompassed a more nuanced understanding of literacy by including the disciplines of history, anthropology, linguistics, and psychology (Lankshear & Knobel, 2011). Perry (2012) noted that Gee's and Street's conception of new literacy studies was a variation of critical literacy, which was undergirded by Heath's (1980) understanding of literacy as a social practice. Heath's renowned ethnographic work noted the recursive relationship between social and school-based literacy practices. This work is often considered to have informed a generation of subsequent sociocultural literacy research.

We purposefully outline this short review of criticality because it provides a foundation to discuss what type of instruction best serves

linguistically diverse students (LDs).¹ De Kleine and Lawton (2015) defined LDs as those who speak a language other than English at home. De Kleine and Lawton identified this group of students and the vast number of languages they speak, including Bengali, Chinese dialects, French Creole, hybridized French, Indian English, Jamaican Creole, Korean, Mamuju, numerous Mexican Spanish dialects, Sierra Leonean Krio, various Spanish dialects, and a host of other languages. Even in today's academic literature, LDs are widely misunderstood, aggregated with other populations, or simply not researched. This work considers the concerns of LDs and what type of instructional method best serves them.

In the current study, LDs are students of the African diaspora and Latino/as. Lehner (2007) described students of the African diaspora as first- and second-generation Africans from various countries. Generally, in community college classrooms, these students are seen as African Americans, even if they are dominantly Spanish speakers. The pseudonymous University Heights Community College (UHCC), at which we conducted our study, classifies such students as Black, almost regardless of ethnicity. However, each student of the African diaspora represents a distinct culture and often possesses a different learning disposition. LDs are engaged in a complex form of cultural acquisition once they are immersed in the U.S. classroom environment. They are different from their African American peers even as they assimilate into the broader urban culture, which is deeply influenced by African Americans.

¹ In this article, the term *LDs* is used purposefully. The letters *L* and *D* are capitalized, and the *s* is lowercase—LDs. LDs is always plural in this paper. The use of LDs is consistent with the academic literature. Also, LDs is not to be confused with similar terms, such as LD (learning disabled) or LDS (Latter-day Saints).

We employed Lehner's (2007) work because it disaggregated the larger grouping of African Americans. Lehner also analyzed how the term *African American* is not accurate when working with the African diaspora. In large cities, African immigrants are usually categorized as Black or African American. However, these descriptors carry little value. Before employing Williams's (2009, 2012) work in earnest, we need to explain that our population of LDs is both broad and complex. Williams has greatly influenced our work. Nonetheless, we acknowledge that UHCC students often do not fit into the racial and ethnic models provided by institutions of higher learning.

August and Siegel (2006) and Hodara (2012) provided more inclusive language to offer clearer descriptions of English language students as language minority students (LMS). We cite August and Siegel and Hodara for their noteworthy appraisals of previous poorly theorized terms, such as *English language learner* and *English as a second language*. However, we theoretically transition from the LMs conceptualization in favor of a more modern and inclusive term: *LDs*. In our transition of terms, we bring the insights developed by August and Siegel and Hodara into our understandings of LDs.

De Kleine and Lawton (2015) defined LDs as English language learners who speak a language or languages other than English. De Kleine and Lawton went on to identify this group of students and the multiplicity of languages they speak. They noted the complexities of LDs' learning dispositions and the relative difficulty that many face in higher education. Some academic literature tends to misrepresent and undervalue the LDs population. Often, LDs are simply not adequately researched. Our work seriously examines LDs and explores the appropriate instructional methods that best support their learning.

Critical Literacy, Community College, and the Complexities of Reading Poorly

In this research we investigate the premise that developmental reading courses are essential for equipping LDs to perform college-level reading. Like Chall (1983), Freire (1970/1993), Gee (1989), Rosenblatt (1988), and Street (2003), all of whom rooted their pedagogy in a form of criticality, Biancarosa (2012) and de Kleine and Lawton (2015) believed that students must be proficient readers. They underscored that students need strong reading skills to transition from basic enactments of literacy to higher level representations of literacy. De Kleine and Lawton contended that students must embody this form of critical consciousness when proficiently analyzing difficult texts. At UHCC, students need to demonstrate a high level of literacy skills when taking their developmental reading exit exam. This exam is specific to UHCC and its affiliated community colleges in New York City.

The perceived mainstream thought is that most developmental reading students do not demonstrate these high-level literacy skills. Over the last decade, developmental reading courses have been fully under review. In fact, Attewell, Lavin, Domina, and Levey (2006) and Hodara (2012) argued that placing students into a developmental reading course actually jeopardizes their probability of success. Montero, Newmaster, and Ledger (2014) seemed to take a very different position. Montero et al. opposed the work of Attewell et al. and Hodara by highlighting that students, particularly nonnative English speakers, profoundly benefit from strong reading programs.

However, in the current audit culture zeitgeist, community college reading researchers may not be required to have any classroom experience or student interaction. Nonetheless, these researchers can have profound influence on community college reading policies. For example, Columbia University's Community College Research

Center (CCRC) seems to have more impact on the City University of New York's (CUNY) developmental college reading curriculum than the instructors who actually teach LDs. When one closely examines CCRC's Institutional Review Board (IRB) applications with CUNY, it is troubling to see that some of the IRB protocols involve no student or faculty interactions (Hodara, 2012). In these studies, nearly every historical CUNY student record was available to CCRC. Yet, instead of investigating actual students in real classrooms, CCRC often used only propensity measurements, thus avoiding the complexity of human subject research. Kincheloe and Tobin (2009) noted that this type of cryptopositivism is standard in the new research era.

Kincheloe (2006) stressed how positivism often contradicts ontological experience. In no small way, instructors of LDs need practical solutions and innovative pedagogy. CCRC, in this sense, seems to have little to offer to the developmental reading research. The employment of statistical formulas and propensity measurements is intellectually astute, yet instructionally and ontologically amiss.

Nonetheless, this type of work seems to trump actual classroom teaching experience. CCRC's research influenced how CUNY determines its entry reading placement. Previously, the passing entry score was 75. However, in a memo to chief academic officers, CUNY Executive Vice Chancellor Vita Rabinowitz noted that CCRC research was a pivotal determinant for changes in CUNY's policy on reading placements (personal communication, September 23, 2016). In other words, LDs could enter mainstream college classrooms with poor reading skills. Although a full discussion of CCRC's research is beyond the scope of this work, it is important to note that LDs are an at-risk population. LDs at the K–12 level may receive support from numerous programs for their underdeveloped reading skills. For example, LDs are eligible for services under

the Individuals with Disabilities Education Act, Title I of the Elementary and Secondary Education Act, Response to Intervention, 504 plans (Scruggs & Mastropieri, 2003), and numerous other educational supports. However, at the college level, LDs receive few instructional supports in the community college setting, primarily because the associated federal funding from IDEA are not available at the college level.

LDs frequently populate the developmental reading classrooms, and efficacious pedagogical strategies are needed to support them. Guba and Lincoln (1989) noted that catalytic research tends to offer marginalized students greater access to classroom learning opportunities by changing instructional approaches. We implemented Guba and Lincoln's model primarily because it greatly benefits LDs. We note the importance of Guba and Lincoln's authenticity criteria as an informing principle of this work.

Theoretical Framework

The New London Group (NLG, 1996) developed a theoretical framework for teaching literacy. Their critical model may enhance instruction for community college developmental readers. Williams (2009, 2012) highlighted the importance of the NLG's form of criticality when teaching underserved students. This pedagogical framework attempted to broaden literacy by incorporating a multiplicity of discourses into instruction. The NLG's extension of literacy may be helpful in teaching LDs by providing resources purposefully designed to support learning.

The multiliteracy theory developed by the NLG (1996) has been one framework informing the community college reading curriculum (Williams, 2009, 2012). In this work, we decisively integrated the multiliteracy theory approach into the study's treatment. We implemented this approach to ascertain its appropriateness for LDs and

investigated whether the critical literacy model benefits LDs' reading skills. Part of the study's treatment, explained below, underscores how broadening the scope of reading may give LDs more opportunities to pass the required reading exit exam and ultimately achieve college success.

Williams (2009, 2012) contended that the instructional methods used by community college developmental reading courses may be insufficiently complex and pedagogically ineffective. She underscored the arcane and constantly shifting theoretical and instructional frameworks that underpin the teaching of college reading. Montero et al. (2014), de Kleine and Lawton (2015), and Wong, Indiasi, and Wong (2016) all articulated that community colleges underserve their LDs. They also highlighted that LDs can subsequently be underprepared for the rigors of college work. For example, both de Kleine and Lawton and Wong et al. noted how LDs tend to have difficulty in college classrooms, and they suggested pedagogical interventions. De Kleine and Lawton and Wong et al. highlighted that without an effective instructional model, students often fall behind in their ability to read. Ultimately, ineffective pedagogy decreased LDs' chances of successfully completing college.

Social Reproduction: When Reading Underachievement Appears Entrenched

When entering freshmen read poorly, it is likely that they will continue to reproduce this level of underachievement. Borrowing an idea from Merton's (1968) seminal work on social reproduction, Stanovich (1986) labeled this underachievement the *Matthew effect*. Attewell et al. (2006) and Hodara (2012) contended that developmental reading courses in community colleges are a complex form of social reproduction. Often, there is an expectation that when community college students are placed into developmental reading they will become better readers. However, many students—particularly LDs—

fare poorly in acquiring better reading skills. Reading underdevelopment could occur due to the complex interplay between decontextualized developmental instruction and the complexities of social reproduction.

Reading proficiency remains a core component of social reproduction for many students. Ziegler and Lehner (2016) noted that underdeveloped literacy skills are a fundamental driver of poor academic achievement. Montero et al. (2014) underscored the complexities that students from poverty and the working class face while attempting to pursue career aspirations outside of their given social class. And, relevant to the juncture of ethnicity and social class in this work, Kao and Thompson (2003) detailed the intersection of ethnicity, class, and immigration status related to educational achievement.

More recently, and specific to college-level reading, Hodara (2012) described how first-generation college students struggle to learn the dispositions and practices of college reading. Ballantyne, Sanderman, and Levy (2008) noted the significant role that social class plays in the development of underachieving freshman college reading. Graff (2008) noted how the practices of college-level reading are unnecessarily obfuscated, often encumbering students' learning processes rather than acculturating them to academic reading. To date, the literature on freshmen college reading highlights that reading is the conduit by which students enter the academic conversation.

If students enter college with underdeveloped reading skills, it is likely that they will continue to perform poorly. As noted above, Stanovich (1986) labeled this underachievement the Matthew effect. Wollscheid, Sjaastad, and Tømte (2016) noted that Stanovich's conception of the Matthew effect prominently applied to the development of academic skills. Wollscheid et al. (2016, p. 20), in reviewing the literature at the intersection of academic instruction and neuroscience, asserted that too little time is

afforded to developing strong academic skills. They noted, as Stanovich did over 30 years ago, that the development of reading skills is complexly interwoven with social class, prior reading history, and types of academic reading instruction taken.

Using Critical Literacy to Navigate Racial/Cultural Divides

In community colleges, race and social class often play determining roles in the placement of students into developmental reading courses. In addition to racial and class barriers, Williams (2009, 2012) noted that financially disadvantaged students are often culturally unacquainted with the demands of higher education. Students unaccustomed to the culture of higher education are often at risk for underachievement. In this study, Latino/as² (Acevedo-Gil, Santos, Alonso, & Solarzano, 2015) and members of the African diaspora often are the students who populate the classes at UHCC.

LDs are the focal point of this study. Hodara's (2012) conception of LMs transitions well into a new theorization of UHCC students as LDs. As highlighted earlier, de Kleine and Lawton (2015) described LDs as living in households where the dominant language spoken is not English.

Classroom Pedagogy That Best Serves LDs

Researchers often describe college developmental reading classes as antiquated. They underscore that instructors often use a

² *Latino/a* is a politically contested term since its root word is Latin. *Latino/a* can thereby be viewed as rooting identity markers in colonialism. *Mexicano/as*, *Chicano/as* and other Central and South American Spanish speakers strongly contest this phrasing. We knowingly use these contested terms while understanding their complexity. We follow the simpler, but not necessarily better, rubric highlighted in our citation.

teacher-centered curriculum, which is frequently ineffective in meeting the needs of LDs. Beyond simply critiquing current practice, Williams (2009, 2012) also provided an empirical model on which future practice could be based. She contended that critical literacy could be an important pedagogical framework for teaching developmental reading.

We applied Williams's (2009, 2012) critical literacy framework in the UHCC setting. Williams's pedagogical framework is a promising instructional method. Nonetheless, the method is untested with the LDs population. Our primary objective was to test the efficacy of the critical literacy model for LDs. We examined the validity of Williams's framework in the LDs population and whether the applied framework afforded LDs learning opportunities in improving their reading skills. Also, we specifically tested whether the treatment influenced LDs' reading performance on the exit exam. In sum, we investigated the potential of Williams's application of critical literacy to the LDs population.

The central research question guiding this work centers on the degree to which an instructor's purposeful implementation of critical literacy (the treatment) can positively influence final exam scores.

Background to the Research

Savva (2016) and Kuo, Chen, and Ko (2016) highlighted that LDs need to be motivated by the curriculum. Similarly, the NLG (1996) underscored instructional advantages to using a method that garners student interest. When teaching LDs, the instructional intent is to scaffold the learning of reading skills. Developmental reading is often the first course that LDs encounter in college. Accordingly, it is imperative that these courses be designed to benefit this population. These types of courses are designed to foster reading skills that could lead to college achievement.

Cope and Kalantzis (2000) and Savva (2016) examined the gap between language skills and LDs. At UHCC, language difficulties may influence underachievement. Cole and Pullen (2009) noted that exposing LDs to diverse, contextually relevant reading materials promoted learning. Stille and Cummins (2013) and Kuo et al. (2016) contended that students are often more engaged when reading digital texts with pictures than traditional books. D'warte (2016) and Wong et al. (2016) underscored that college developmental courses necessitate advanced instructional methods. They highlighted that the diverse populations in developmental community college reading courses often require instructors to revise and innovate their pedagogy (G. Gay, 2010).

The literature reviewed above highlights the importance of instructional innovation for LDs. Yet, what instructional methods work best? Catalytically, much like the work of Guba and Lincoln (1989) and Greenwood and Levin (2006), the overall goal is to hasten LDs' success. Researchers may claim that their work has catalytic authenticity but provide only qualitative evidence as support, because in critical literacy the dominant research methods are case studies and ethnographies, which can be insightful yet difficult to replicate. We investigated the extent to which critical literacy might be an effective instructional model. We accounted for the perspectives above and developed a treatment that employs critical literacy. The treatment is described below.

The Treatment: Employing Critical Literacy as an Instructional Framework

We developed a critical literacy pedagogy based on Cole and Pullen's (2009) notion of instructional design to reach diverse students. The objective of this study was to explore whether instructors' use of critical literacy was associated with higher scores on standardized exit exams. To this end, our research centered on critical literacy as an experimental

treatment. We evaluated the hypothesis that the critical literacy instructional method prepares Reading 200 students to score higher than their peers on the UHCC exit exam. We tested the hypothesis that critical literacy is a more effective instructional method for LDs by comparing the treatment groups' scores with nontreatment groups' scores. Specifically, Reading 200 is a developmental reading course that prepares its students for college reading proficiency. Moreover, all Reading 200 students are required to take an exit exam prior to enrolling in college-level courses.

Defining the Treatment

We created a curriculum that centered on politically and culturally relevant texts. Our treatment modeled Williams's (2009, 2012) interventions. Like Williams, we specifically selected texts that encouraged students to critically engage course readings. We purposefully designed our study by replicating Williams's work.

Williams (2009) highlighted the complexity of her work and underscored the effort required to implement a wide-scale study of critical literacy:

While critical literacy is feasible, implementation requires an intentionally relentless effort on the part of the instructor. Perhaps the most important starting point is the selection of reading materials. Course readings should extend beyond the developmental reading textbook and should incorporate authentic texts that are relevant to the students' lives. To accomplish this, a thematic approach can be used. As illustrated in the studies reviewed above, possible themes could include identity, academic discourse communities or diversity issues. Another possibility is to organize the reading course around current events or American cultural myths. Such issues are broad enough to encompass the life experiences of students from a myriad of

backgrounds. These issues are also provocative enough to elicit a variety of responses from a variety of perspectives. Once a theme is selected, readings can be drawn from various sources such as periodicals, content area textbooks, thematic readers, poetry books, and essay collections. It is important to select multiple readings that examine the same issues from multiple perspectives. This provides students with the opportunity to grapple with the complexities of these issues and to think critically about the differing viewpoints presented. (p. 44)

Informed by Williams (2009, 2012), the teaching of reading situated in a particular historical period is the treatment in this work.

Student Participants

UHCC, which is located in a large northeastern city, has an enrollment of approximately 12,000 students. For this study, we focused on students from all Reading 200 sections of the spring 2015 semester. All UHCC participants were in their first year. The full study sample was all students in Reading 200 sections ($N = 379$).

According to UHCC student statistics, nonnative English speakers account for 70% of its student body. The vast majority of nonnative speakers enroll in developmental courses. Ninety percent of the UHCC student population are first-generation college students. Over 94% of all Reading 200 students identified as LDs. Demographically, most students are Latino/a, African, or Southeast Asian.

This investigation consisted of a quasi-experiment comparing 13 Reading 200 classes against the two critical literacy treatment groups. All Reading 200 students individually selected their class based on their scheduling needs. Specifically, in the quasi-experimental design, students were the agents deciding which class they entered. This experimental design accounts for the fact that all Reading

200 classes are essentially the same; course objectives, course outlines, and class duration all conform to standards set by the college.

This study is a quasi-experiment. Due to class scheduling, students could not be randomly assigned to any group. However, the treatment and nontreatment groups had comparable student demographics. These characteristics included similarities in country of origin, ethnicity, gender, English language proficiency, and time spent in the United States. Over 70% of Reading 200 participants were Latino/a, and nearly all participants were first-generation college students.

Epistemology Research Stance

Hodara (2012) noted that many LDs find it difficult to complete schooling. Additionally, Williams (2009, 2012) highlighted that many developmental students struggle to successfully navigate the rigors of college. Ballantyne et al. (2008) affirmed that typical LDs withdraw from challenging courses and often drop out of school. Some researchers have focused on studies that marginalize LDs as underachieving “othered populations” (Denzin & Lincoln, 2011). Often, this type of research has focused on the results of failing school systems. Such research tends to ignore the hurdles that many LDs face.

We are educators who seriously consider our students’ background. We endeavor to cultivate an environment that is conducive to teaching and learning. We are informed by the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) and its call to create levels of beneficence and justice for our students. Therefore, we acknowledge the complexities highlighted by Ballantyne et al. (2008), yet we actively search for ways to combat LDs’ dropout rates and college failure. Often, researchers depoliticize and decontextualize the very populations they choose to study. Kincheloe (2008) underscored the political nature of research inquiry. This work is not purposefully

political. However, the research cannot be separated from the historically and politically situated nature of our students’ lives.

In Defense of a Quasi-Experimental Approach

We knowingly employ here what Denzin and Lincoln (2011) might call a highly contested term: *scientific rigor*. We purposefully used a quasi-experimental approach to investigate our hypothesis. We investigated whether critical literacy produces higher exit exam scores. Following the scientific rigor model, we set out to test this proposition. We endeavored to provide quantitative evidence justifying this practice. If the methods are verifiable and reproducible, this model should be extended and widely used. The use of a quantitative design could potentially communicate to the broader academic community that critical literacy may be a powerfully effective approach.

In Defense of Quasi-Experimental Study

This research used an interventional quasi-experiment to evaluate critical literacy’s effectiveness. The National Center for Education Evaluation and Regional Assistance (NCEE, 2015) noted that the highest standard for an intervention study is a controlled randomized experiment. However, NCEE and L. R. Gay, Mills, and Airasian (2011) underscored that the cost and practicality of conducting such an experiment is not realistic. Borman (2002) and Slavin (2008) have also underscored the difficulty of conducting a pure experiment.

White and Sabarwal (2014) contended that the widespread use of quasi-experiments is valuable. Quasi-experimental research designs can test the efficacy of a knowledge claim. White and Sabarwal postulated the utility of quasi-experiments, noting the usefulness and widespread application of this design. Like White and Sabarwal, NCEE (2015), and L. R. Gay et al. (2011), Borman (2002) highlighted the utility of the quasi-experimental design. Slavin (2008) noted that well-conducted quasi-

experiments closely control for covariance as well as threats to internal and external validity.

Benchmarking Nontreatment Groups

Benchmarking is a process of obtaining consistent levels of measurement on a given task. In this case, benchmarking was used to measure the specific scores on Reading 200 exams in fall 2014 and spring 2015. We specifically benchmarked our students' scores to gain a better understanding of their Reading 200 achievements.

Null and Alternative Hypotheses for Untreated Groups

We state our null and alternative hypotheses to align our research inquiry and possibly give credence to our premise. Benchmarking affords an opportunity to consistently measure all Reading 200 sections prior to a treatment. Documented below are the null and alternative hypotheses.

Null hypothesis. The null hypothesis states that there was no statistically significant difference between the 15 groups in the fall semester of 2014 and the 13 untreated groups

in the spring semester of 2015.

Alternative hypothesis. The alternative hypothesis states that there is a statistically significant difference between the 15 groups studied in the fall semester of 2014 and the 13 untreated groups in the spring semester of 2015.

Benchmarking and Data Analysis Centering on p Values

Karjalainen (2003) defined benchmarking as a systemic valuing of a given set of results. We evaluated the untreated students' progress over two semesters and benchmarked these results to determine if the groups were statistically different. Campbell and Rozsynai (2002) informed our decision to use the process of benchmarking; this approach determines whether the groups can be statistically compared. The exit exam score results of all untreated groups are reflected in Figure 1.

The fall 2014 sections calculated at 69%, and the spring semester of 2015 calculated at 70%. Collectively, the treatment groups' scores on the final were 82%.

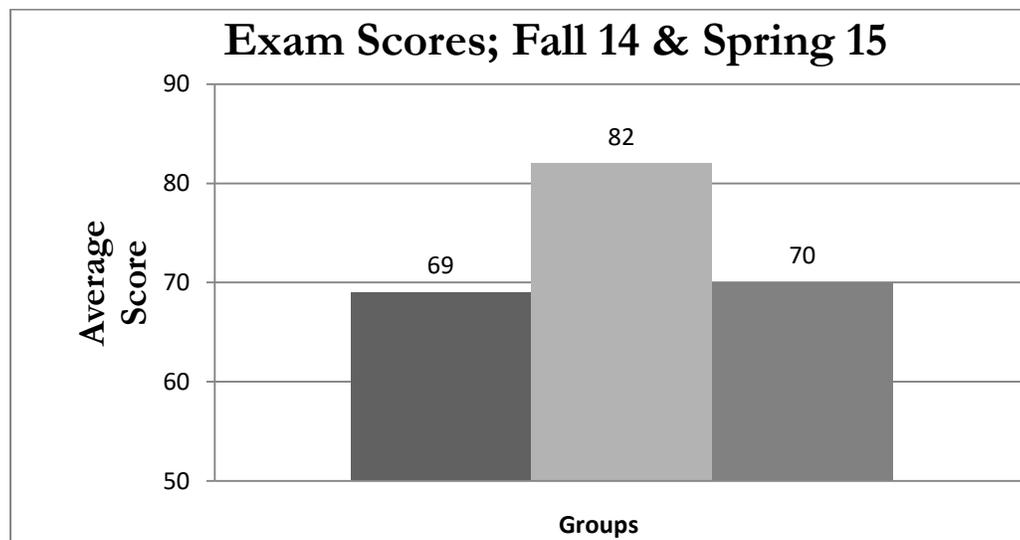


Figure 1. Exam scores, Fall 2014 and Spring 2015.

The p Values for All Untreated Groups

These two groups were statistically similar. We determined this by calculating the p values. Closely abiding by Karjalainen (2003), we found that these two sections of groups were statistically the same. We examined the final assessments for all the untreated sections and found that the p value was .006. The value was less than .05. Therefore, we must accept the null hypothesis. All the nontreatment groups were statistically similar. All 15 fall 2014 Reading 200 sections and the 13 nontreatment spring 2015 sections were statistically similar. The scores were roughly the same even though the sections were taught by a number of instructors and attended by different students over the course of two semesters.

The Critical Literacy Study

We benchmarked the scores of Reading 200 students over a 1 year period. We did this to support the seriousness of our knowledge claim that the critical literacy method improves exit exam scores. However, we first benchmarked exit exams to illustrate the performance of untreated groups. As noted above, there were no differences between all Reading 200 sections in the fall of 2014 and all untreated sections in the spring of 2015.

The Hypothesis, Treatment, and Analysis of Variance

Traditional inferential studies outline two hypotheses. Below, we note the null and alternative hypotheses.

Null hypothesis. The null hypothesis states that there is no difference between the 15 groups studied in the spring semester of 2015.

Alternative hypothesis. The alternative hypothesis states that there is a statistically significant difference between the 15 groups studied in the spring semester of 2015.

Results

Data obtained from the 15 sections of Reading 200 held in the spring semester of 2015 indicated that students who received the treatment performed significantly better than their peers who did not receive the critical literacy model intervention.

Analysis of Variance

The one-way analysis of variance (ANOVA) is critical for this study. ANOVAs are primarily used to determine if there are statistically significant differences between groups. This single-factor ANOVA compares the means between groups and offers insight into whether a statistically significant relationship exists.

Table 1 shows the treatment groups' scores compared to the untreated classes and also summarizes each of the 13 nontreatment groups' scores. The treatment groups scored significantly better than the pooled nontreatment groups

This single-factor ANOVA tests whether the populations' means are equivalent. A one-way ANOVA, as noted above, analyzes the means of the sample groups. As seen in this ANOVA, the sample groups are not equal. For example, in Table 1, the treatment groups significantly outperform the other classes.

The critical literacy study conceptualizes the treatment as the independent variable. This ANOVA compares the means of 15 samples. When these groups are compared, it becomes apparent that we must accept the alternative hypothesis: There is a statistically significant difference between the 15 groups studied.

Conclusion

The findings presented in this research reveal that the critical literacy model positively impacts LDs' exit exam scores. Students in the treatment group significantly outperformed their nontreatment peers. This

Table 1

Summary of ANOVA, Single-Factor Treatment Group, and Nontreatment Group

Group	Count	Sum	Average	Variance
Treatment				
1	26	2,093	80.5	69.86
2	27	2,180	80.74074	62.89174
Average			80.6204	66.3759
Nontreatment				
3	22	1,692	76.90909	98.84848
4	20	1,007	50.35	242.2395
5	23	1,721	74.82609	53.60474
6	19	1,130	59.47368	76.04094
7	25	1,510	60.4	115
8	27	1,933	71.59259	80.71225
9	27	1,924	71.25926	261.661
10	27	2,081	77.07407	114.2251
11	27	1,858	68.81481	260.6952
12	27	2,083	77.14815	100.4387
13	27	1,723	63.81481	94.46439
14	27	1,684	62.37037	152.8575
15	27	2,115	78.33333	132.6154
Average			68.64356	137.185

result may be attributed to the treatment. In particular, the treatment may influence student participation, supporting their reading development. This instructional platform may be able to impact LDs' overall college academic performance. However, more research is needed to make such a definitive knowledge claim.

Summary of the Benchmarking

Summarizing the benchmarking portion of the research, it is noteworthy to highlight that the mean of all nontreatment groups is 9.5%. That is, all 15 groups from the fall

semester of 2014 and the 13 untreated groups in the spring semester of 2015 are statistically similar. Therefore, the benchmarking null hypothesis must be accepted since there are no statistically significant differences between the two groups. The benchmarking is central as it demonstrates how different the treatment groups' exam scores are compared to the nontreated groups.

Summary of the Critical Literacy Study

In this critical literacy study, the alternative hypothesis must be accepted because there is a statistically significant

difference between the 15 groups studied in the spring semester of 2015. The spring semester 2015 results indicates that critical literacy is a viable model. When employed, this model's pedagogy resulted in improved reading comprehension, as demonstrated by the department's reading exit examinations. Results obtained from the total final assessment scores of all 15 nontreatment Reading 200 sections for the spring semester 2015 indicates a 70% passing rate, whereas LDs in the treatment groups show an average of 82%.

Discussion

The study's purpose was to investigate whether the critical literacy model benefits LDs reading skills. Findings from Williams (2009, 2012) indicated that using the critical reading model may improve developmental reading performance. In this study, LDs' performance on their exit examination seems to indicate that the approach is associated with some promising results.

It seems that the treatment's supportive yet rigorous educational environment may have provided learning scaffolds for reading development. The critical literacy instructional activities, such as guided reading and discussions, could have contributed to a learning system for the treatment group. Darling-Hammond (2010) noted that a learning system "advisedly describes a set of elements that, when well designed and connected, reliably support all students in their learning" (p. 1). In this work, the critical literacy model proved to be an effective instructional medium for improving LDs' reading exam exit scores.

Limitations

There are a significant number of limitations with this study. For example, this study records only 1 year's worth of student outcomes. It could be argued, therefore, that the significant dependent variables are

instructors. The results obtained from the use of the critical literacy model centers on too few classes to make bolder knowledge claims. More research would be required to investigate this more fully. Despite the limitations, there seems to be enough evidence to continue researching this model. Any form of pedagogical improvement would be advantageous considering LDs' poor reading performance upon their entry into developmental reading courses. In this study, the performance rate of LDs who received the treatment was 12% higher than that of the nontreatment group. In terms of next steps, researchers should continue to investigate critical literacy as well as the impact of using technology to teach reading. The work of the NLG (1996) has promisingly advanced another level of research, which would investigate aspects of critical youth literacy and other forms of criticality related to reading.

Summative Findings

Critical literacy seems to work well for improving LDs' reading skills. Moreover, our findings are broadly consistent with those of Williams (2009, 2012). Our data also show that using digital texts, videos, and culturally and political relevant books seems to be an important strategy. However, more research is required to definitely support this knowledge claim. Also, the treatment groups' outperformance may strictly center on technology. This may also be an important limitation. Nonetheless, more research is needed to understand why LDs treatment groups outperformed their untreated peers.

In spite of the limitations, these findings add useful pedagogical concepts for instructors who teach LDs. The pedagogy seemed to be an important factor in this work. For example, the treatment groups seemed to be eager to learn and often actively engaged in the classroom activities. The pedagogy of critical literacy also seemed to expose students to various ways of processing information.

One significant implication for teachers of LDs is the necessity for examination of pedagogy. In particular, this study's use of the critical approach seems to afford more learning opportunities.

Summary and Instructional Recommendations

Does the critical reading model work? The answer is a resounding yes. Critical literacy, particularly in this study's setting, worked well. Critical literacy may work primarily because it uses a variety of instructional formats that align with LDs' learning needs. Byrd (2016) contended that teaching methods that connect with students' interests promote better academic outcomes. The critical reading model recognizes the importance of the LDs' cultural capital and how it may promote a strong learning environment. One primary role for the community college developmental reading classroom is to provide scaffolds for struggling readers. LDs often encounter reading difficulties while tackling the demands of college reading. Therefore, critical literacy is an exceptionally good pedagogical fit with LDs.

This work focuses on critical literacy. However, in part, the findings indicate that there is a need for pedagogical flexibility. Instructors should examine their own dispositions. Simply put, educators of the LDs population need to deploy emotional intelligence and use strategies that support their students. Frequently, if not daily, college reading instructors should seek to relate the texts to the students' lives. LDs' educators also should also scaffold appropriately. The

use of diagrams and pictures frequently promotes textual processing. Also, instructors can model the required reading steps by using step-by-step diagrams. This method, particularly in a historically situated reading instruction environment, may assist in the development of reading skills. Supportive and appropriate scaffolds seem to allow LDs to improve their reading skills.

LDs' teachers can also align the instruction in ways that benefit students. For instance, instructors can integrate group work into a historically situated classroom. The historical theme provides a type of scaffold that can support other group activities. Discussion modules can conform to the content area. Historically situated themes can, for example, be aligned by focusing on similar but related vocabulary and synonyms. An instructor could break the class into groups and have the students create "mini-presentations" focused on World War II battle themes. Although arguably militaristic, similarly themed words appear often. These words and their synonyms can be used to present in both small-group and whole-class discussions.

This study's conclusions and implications are based on only two treatment groups. Although these initial findings seem promising, further and more detailed research is needed. In particular, research examining several cohorts of LDs over a longer period of time is needed. Going further, we suggest an examination of developmental students' matriculation into nondevelopmental courses. This research could examine whether the critical literacy model continues to inform learning outcomes beyond the initial exposure.

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