Supports to Improve Academic Outcomes with Racially and Ethnically Minoritized Youth: A Review of Research

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Abstract

For decades, racially and ethnically minoritized youth have been subject to unequal distributions of access and opportunity in school, leading to inequities in academic outcomes. Educators require knowledge and skills to provide relevant instruction and create a more supportive, effective classroom environment. This systematic review includes 24 qualitative and quantitative studies in which researchers investigated a culturally responsive classroom intervention or practice to promote academic outcomes for racially and ethnically minoritized youth. Within these studies, authors described several approaches to promote academic success: (a) developing authentic partnerships with families, (b) using effective pedagogy with students' culture infused, and (c) accessing rigorous professional development. In addition, studies were assessed for methodological quality and qualitative works met design standards more often than the quantitative studies reviewed. Implications include the need for additional research to inform comprehensive support for educators to design effective instructional environments for all students, especially those who have historically encountered systemic barriers in school.

Keywords: systematic review, racial diversity, academic supports

Supports to Improve Academic Outcomes with Racially and Ethnically Minoritized Youth: A Review of Research

In U.S. public schools, systemic racism and discrimination have long impacted racially and ethnically minoritized youth (or youth who routinely face oppression or discrimination based on the social constructs of race, ethnicity; Proctor et al., 2017; Stewart, 2013) (Gillborn, 2005; La Salle et al., 2019). In comparison to their White peers, racially and ethnically minoritized youth have been systematically (a) subject to lower academic expectations (Blanchett et al., 2005), (b) taught below grade-level material (Losen & Welner, 2002), and (c) identified less frequently for gifted programs (Grissom & Redding, 2015). This has impacted students' rates of proficiency on standardized tests of reading and mathematics (Trent et al., 2019), rates of graduation (Zaff et al., 2017), and pursuit of a post-secondary degrees (Merolla & Jackson, 2019).

Racially and ethnically minoritized youth (specifically Black, Latinx/Hispanic, and American Indian/Alaskan Native students) are instead overrepresented in high-incidence disability classifications (i.e., specific learning disability, emotional disturbance, intellectual disability), categories for which determinations tend to be more subjective (Sullivan & Bal, 2013) and based on data that may lack validity (Lovett et al., 2020). Fish (2019) discusses the complex intersection of race and disability. Specifically, they describe racially and ethnically minoritized youth are commonly classified with *lower status* disabilities such as emotional disturbance and intellectual disability which present risks (e.g., social stigma, less access to higher level content) in comparison to White students with *higher status* classifications such as other health impairment, speech-language impairment, and autism spectrum disorder which may be afforded more opportunity or support (e.g., greater access to inclusion in the general education classroom, more opportunity for social interaction with peers; see Fish, 2019). Broadly, special education is considered a civil right and social good intended to provide necessary and appropriate services for

students with disabilities. However, it may also lead to "stigmatization, segregation, exposure to low expectations, receipt of weak curriculum, and constraint of postschool outcomes" particularly for those from minoritized backgrounds (Sullivan & Bal, 2013, p. 476).

In the 1997 amendments to the Individuals with Disabilities Education Act (IDEA) of 1990, states were required to start tracking the number of students with disabilities served by race/ethnicity. When IDEA was reauthorized in 2004, lawmakers prioritized addressing inadequate academic instruction that could lead to racial disparities in disability classification (Fletcher et al., 2004). The No Child Left Behind Act (NCLB) of 2001 also emphasized the importance of detecting underperformance of disadvantaged groups. Furthermore, NCLB's successor, the Every Student Succeeds Act of 2015, emphasized accountability for educational performance of distinct subgroups including those defined by race and ethnicity (Gordon, 2017).

Researchers have suggested that educational systems inclusive of culturally responsive instructional practices may address disproportionate representation of racially and ethnically minoritized youth in special education by promoting equitable access to high-quality instruction in inclusive educational environments (Klingner et al., 2005). The purpose of this paper is to provide a systematic review of studies in which researchers investigated a culturally responsive classroom intervention or practice to promote academic outcomes for racially and ethnically minoritized youth. Below is brief rationale for the study and a concise review of research related to considering student culture in the implementation of academic supports.

Access and Opportunity

Scholars contend that educational outcome disparities are the result of unequal distributions of access and opportunity (Allbright et al., 2019; Flores, 2007; Milner, 2012a). Inequities in public education are driven by and an entrenched history of systemic oppression toward minoritized individuals maintained by a normalized culture of Whiteness (Brown, 2014).

Storlie and Toomey (2016) provide examples of this, including how cultural values important to many Latinx/Hispanic individuals (e.g., familism, ethnic identity, collectivist orientation, collaboration) may not be seen as acceptable in school due to the pervasive dominance of values associated with Whiteness (e.g., individualistic orientation, separateness, competition).

Systemic racism is perpetuated by those in dominant positions to maintain social power, which in turn can create challenges for racially and ethnically minoritized students to achieve academic success (Picower, 2009). A complete account of historical events and sociopolitical forces that have maintained racism and oppression in schools is outside of the scope of the current review. However, many scholars have written extensively about this (e.g., Grooms et al., 2021; Milner, 2012b) and have called for dismantling racism by removing systemic barriers to access and opportunities in schools (Picower, 2021). Part of this work is calling on educators to build the consciousness, knowledge, and skills necessary to cultivate relevant, rigorous, culturally responsive learning environments (Muniz, 2019).

Educators must acknowledge students' multiple, intersecting identities and incorporate *student culture* in the design and delivery of academic instruction and supports (e.g., Gay, 1993; Ladson-Billings & Tate, 1995). Culture refers to group values, ways of thinking, standards of behavior, and beliefs, with race and ethnicity anchoring an individual's identity and expression (Gay, 2000). For decades, scholars' theoretical work related to multicultural education, culturally responsive teaching, and culturally relevant pedagogy have laid the foundation for changing educational practice. A summary of key theories related to culture and education is presented in the next section. Then, recent quantitative and qualitative research aimed at improving academic outcomes for racially and ethnically minoritized youth in the classroom are synthesized. Then, the findings of the review highlight examples and applications associated with the theories described below.

Culture and Education

Banks (1973) was among those who pioneered the *multicultural education* movement indicating the need to reform instruction to provide students from diverse racial, ethnic, and cultural groups the opportunity to experience educational equity. This notion shaped a multicultural instructional framework, which included five dimensions: (a) *content integration* (including examples, resources and ideas from students' cultures when teaching), (b) *knowledge construction* (aiding students to understand implicit cultural bias and generate their own knowledge, (c) *prejudice reduction* (building knowledge of cultures, promoting intergroup contact, and reducing prejudice), (d) *equity pedagogy* (using a variety of instructional methods and collaborative learning tasks to connect home and school), and (e) *empowering school culture and social structure* (challenging the systems within schools and the community to promote reform that would encourage equitable access to opportunity; Banks, 1997). Banks described these dimensions as both unique and overlapping.

Gay (2000) defined *cultural responsiveness* as it pertains to classroom instruction broadly. She indicated that cultural responsiveness is the consideration of individual differences (e.g., culture, language, heritage, experiences), and the act of seeing those differences as both normative and an asset to the classroom community. Specifically, she indicated culturally responsive teaching is validating (affirming of cultural heritage), comprehensive (teaching the whole child), multidimensional (inclusive of diverse experiences), empowering (promoting confidence and agency), transformative (challenging traditional practices), and emancipatory (giving students a voice; Powell et al., 2016). Around the same time, Ladson-Billings (1995) indicated that teachers who use *culturally relevant pedagogy* (a) build curricula that reflect students' culture, (b) vary their teaching methods dependent on student need, (c) set high expectations for learning, and (d) establish relationships with students' families.

The work of Gay (2000) and Ladson-Billings (1995) disrupted deficit approaches that were popular for decades; undermining the notion that many racially and ethnically minoritized students had deficiencies to overcome to be successful in school. More recently, Paris and Alim (2014) further drove *asset pedagogies* forward by proposing that educators should engage in *culturally sustaining pedagogy*, which includes efforts to perpetuate (i.e., sustain) linguistic and cultural pluralism in the classroom. This involves educators embracing students' cultures and valuing students' languages, histories and ways of being in the classroom (Paris & Alim, 2017).

Validating students' home culture and language is emphasized in the work of many other researchers, including sociolinguists. Powell and colleagues (2016) described the importance of language in culturally responsive instruction. Specifically, they referenced the work of Gee (1989) who proposed that each individual has a "primary discourse" (i.e., how interactions occur at home and in the community; part of a person's "identity kit") and many secondary discourses. Educators are encouraged to acknowledge there is a dominant discourse, spoken by those in power, and Delpit (2006) argued that many students must learn "power literacy" to access the dominant culture in school. Power literacy involves learning the codes and/or rules for communicating with those in power (e.g., how to dress, speak, talk, write, interact; Delpit, 1988). Furthermore, scholars contend that validation of students' home language is critical, as well as expressing to students that no language is superior but rather more apt in certain social contexts (Seals & Peyton, 2017). It stands to reason that attention to and appreciation of student culture promotes positive outcomes (Byrd, 2016), but studies are needed to advance the field's understanding of this relationship.

Consideration of Culture and Academic Supports

Research addressing how consideration of culture and academic supports intersect to support student outcomes has largely been conceptual. For instance, Muniz (2019) drew from prior theories to posit that culturally responsive teachers must be trained to provide relevant,

rigorous instruction. This conceptualization, however, has not been studied empirically. Furthermore, many of the existing studies related to cultural responsiveness in the classroom are descriptive (e.g., case studies of exemplary classrooms; Byrd, 2016). A synthesis of available research is critical to building a more robust literature base to guide educators' action.

Syntheses focused on culturally responsive (a) school leadership (Khalifa et al., 2016), (b) teacher in-service training (Bottiani et al., 2018) (c) schooling for certain student groups (e.g., indigenous youth; Castagno & Brayboy, 2008) and (d) pedagogy for specific content areas (e.g., mathematics; Thomas, & Berry III, 2019) exist. These syntheses supplement the few available systematic reviews that target cultural responsiveness in the classroom more generally. Morrison and colleagues (2008) reviewed 45 classroom-based studies of culturally responsive pedagogy. The focus of their analysis was to link teacher actions described in eligible studies to Ladson-Billings' (1995) theory of culturally relevant pedagogy. Results indicated that no study embodied Ladson-Billings' complete theory. Also, the authors did not report specific study characteristics nor the quality of the research reviewed, limiting the conclusions drawn from findings.

Similarly, Aronson and Laughter (2015) reviewed 40 studies and dissertations focused on culturally relevant education. The vast majority of research included in the review were case studies, with only two studies applying a pre- and post-test design (both producing insignificant results). A methodological limitation was that the authors only included the terms "culturally relevant pedagogy" and "culturally responsive teaching" in the search. Broadening the search terms may reveal more intervention studies for which teachers implemented a change in their practice to support minorized students' academic outcomes in the classroom. The limitations to prior reviews inform the purpose of the current study.

Purpose of Study

The purpose of the review was to implement a broadened search procedure to capture studies possibly missed in prior reviews. Studies included in the review were to contain a culturally responsive support or intervention provided to youth to affect an academic outcome. Specifically, studies for which educators making a change to their practice, implementing an intervention, or providing a support to students in classrooms in which the majority of youth identified as racially and ethnically minoritized youth[1] were included. Studies were required to include a quantitative (single case design, group design) or qualitative analysis as well as an academic dependent variable. The search focused on the two decades after IDEA (1997) as this is when the policy required states to start tracking the number of students with disabilities served by race/ethnicity. The research questions were:

1. What culturally responsive academic supports, interventions, or practices implemented to promote an academic outcome with racially and ethnically minoritized students (>50% of the sample) in school (e.g., public, private) and classroom settings (e.g., general education, special education) have been studied with quantitative or qualitative methodology from 1997-2018?
2. Of the studies that met search criteria, what were the general study characteristics (e.g., type of implementer, participants, intervention setting, and type of support or intervention provided) and the quality of research employed?

Upon searching and systematically screening abstracts, studies that met inclusion criteria were coded and subject to review using quality standards for research as proposed by the What Works Clearinghouse (WWC; 2017b) and Brantlinger and colleagues (2005). The decision to

[1] It should be noted that the focus on racially and ethnically minoritized youth is not meant to homogenize a heterogeneous population, but rather to be succinct in the description of the research purpose and method. The researchers anticipated that the samples from studies reviewed would include students from many distinct racial and ethnic backgrounds.

include unpublished dissertations was to capture the "gray literature," reduce publication bias, broaden the review's scope, and adhere to the methodological standards outlined by the WWC.

Method

Below is an account of search procedures, eligibility criteria, as well as how studies were retrieved, screened, and coded (Talbott et al., 2018).

Search

Studies were located via two levels of screening. The first was an electronic database search of five widely used educational and social sciences databases: ERIC, PsycINFO, PsycARTICLES, Education Full Text, ProQuest Dissertations and Theses. Abstracts were searched with terms including culture*, divers*, race, ethnic*, minorit*, African American OR Black OR Hispanic OR Latino/a/x OR Chicano/a OR Asian OR Native American OR Indigenous OR American Indian OR Native Hawaiian OR Pacific Islander OR multiracial OR multiethnic OR multiple race* AND academic* OR pedagogy OR instruction OR intervention OR practice* OR teach* OR achieve* AND school. Only quantitative studies conducted in the United States were included. This produced 785 unduplicated results that were subsequently screened for inclusion in the review (see Figure 1). Studies were required to occur in a school context in the U.S., be published in English as a peer-reviewed journal article or dissertation between 1997-2018 (in the 20 years after the 1997 amendments to IDEA were passed), and include an intervention, change in academic instruction and/or practice as the independent variable. This initial screening resulted in 56 studies. Researchers reviewed the reference lists for these 56 studies (i.e., performed an ancestral search) and located an additional 13 studies to include in the second level of screening.

Screening

The 69 studies identified from both the database search (56 hits) and ancestral reference list review (13 hits) were screened according to five criteria. To satisfy inclusion criteria, a study

had to include (a) an analysis of the effectiveness of a support, intervention, or practice as the independent variable, (b) a student academic dependent variable (e.g., achievement, fluency, accuracy), and (c) a student sample for which > 50% identified as a race or ethnicity other than White and were enrolled in (d) Grade K – 12 in (e) a school (not educated at home, in a residential setting or at a hospital, for instance).

Coding

Researchers documented various aspects of each article using a coding manual. The coding manual was developed by the first author (contact for a copy) by adapting the items of coding manuals used in similar previously published systematic reviews (e.g., Fallon et al., 2015; 2018) to collect data aligned with the research questions of the current study. Described in greater detail below, upon developing an initial draft of the coding manual, the first author solicited input from all members of the research team, requesting the team provide feedback to clarify item wording, define confusing terminology, indicate if additional response categories were needed for any item, and suggest items missing from the manual that were required to answer the research questions. Then, the first author incorporated feedback from the research team and finalized the protocol for study coders to use systematically when review research studies.

The finalized manual included items aligned with six sections: (a) screening, (b) study characteristics, (c) implementer characteristics, (d) student characteristics, (e) intervention characteristics, and (f) study quality. Study quality items were separated by study design: quantitative (single case, group) and qualitative studies. These items were derived by the noting the presence or absence of the design features described in the Study Quality section below. Screening items were developed by phrasing the five screening criteria in the form or a “yes” or “no” question. Next, coders gathered relevant data related to study, implementer, student, intervention and outcome characteristics from research reviewed.

Study, Implementer, and Student Characteristics

For each study included in the review, coders documented: (a) the type of implementer in each intervention (e.g., general education teacher, special education teacher, paraeducator, student support personnel, researcher), (b) the number of implementers, and (c) the implementer's years of experience. Student characteristics assessed included: (a) the number of student participants, (b) the number of student English Learners (EL) in the sample population, (c) the type of school setting (i.e., elementary, middle, high), (d) the disability status of participants, and (e) student race (i.e., Latinx [Hispanic Origin], African-American/Black, Caucasian/White, Asian, Native Hawaiian/Pacific Islander, Multiracial, American Indian/Alaska Native).

Intervention and Outcome Characteristics

Intervention characteristics reviewed included (a) a description of academic supports, interventions or practices targeted (e.g., math, reading), (b) operational definitions of these supports and replicability, and (c) the dependent variable (e.g., unit tests). Coders also documented if treatment fidelity data were assessed and how those data were collected.

Study Quality

Additionally, coders reviewed each study to document features of design quality (Talbott et al., 2018) to address Research Question 2. This was a necessary precursor to evaluating the effectiveness of the academic practices studied in future research syntheses. So as not to conflate poor design with limited outcomes, understanding current implementation of academic practices and supports with minoritized youth was seen as contingent on the integrity of the research.

Single Case Design Studies. Coders developed a protocol (available upon request from the first author) to review cases and overall studies for methodological quality and evidence (please see *WWC Standards Handbook*, Version 4.0 (WWC, 2017b) for a complete description of standards used in review of study quality). Study designs were reviewed and classified to have *met*

design standards, *met standards with reservations*, or determined that it *did not meet standards.* For each study that met design standards, coders conducted visual analysis to determine whether *strong, moderate,* or *no evidence of a causal relation* could be determined for all outcomes measured (WWC, 2017b).

Group Design Studies. Group design studies were coded using the WWC Study Review Guide (https://ies.ed.gov/ncee/wwc/wwcsrgpublic; Standards Version 4.0, Single Study Review Protocol Version 2.0) to evaluate each study's eligibility for review, then design and evidence. First, studies were screened to determine their eligibility for review during the screening procedures. Each study was reviewed to determine if it (a) contained a primary analysis that examined the effectiveness of an intervention, (b) used an eligible design, (c) addressed at least one relevant outcome, and (d) recruited an appropriate sample. If eligible, the study was reviewed to determine if results (or the study's evidence) *meets standards*, *meets standards with reservations*, or *does not meet WWC standards*. Finally, coders reviewed published effect sizes for studies meeting standards with or without reservations.

Qualitative Studies. To determine the credibility and trustworthiness of the qualitative studies screened, coders applied a framework including 10 total quality standards described by Brantlinger and colleagues (2005) and employed in similar reviews (e.g., Bottiani et al., 2018). These quality standards were selected as they address the credibility and trustworthiness of methodological decisions made throughout data collection, analysis, and interpretation processes (Brantlinger et al., 2005). Similar to measures of reliability and validity in quantitative research, these credibility measures allow for generalizability of findings in qualitative research. See Table S1 in supplemental materials for definitions of quality review characteristics.

Coder Training

Coders were doctoral-level school psychology graduate students. A primary and secondary coder was trained by a school psychology faculty member (first author) to conduct the study's search with the identified terms. Then, the coders and first author practiced screening the first 10 results. The coders then conducted screening of search results. Once screening was complete, the coders rated studies by first reviewing the coding manual with the first author. Then, each coder practiced coding three articles. After practice was complete, answers were compared and discrepancies in ratings were discussed with the first author until consensus was reached.

Inter-rater Agreement

After training, the primary coder independently coded articles using the manual. The secondary coder also coded 33.3% of the studies screened into the review for the purpose of calculating inter-rater agreement (IRA). These studies were determined randomly using randomizer.org. To calculate IRA, item-by-item agreement was used. That is, if the two raters coded an item in the manual in the same manner, it was counted as an agreement. Then, the total number of agreements was divided by the total number of possible agreements. Overall, IRA for the screening procedures was 100% and 97.9% for all coding procedures. Any discrepancy between the two coders was reviewed by the first author to resolve.

Data Analysis

Descriptive statistics (i.e., frequency counts, percentages) were used to summarize coding variables across the 24 studies that met inclusionary criteria (see Table 1). To categorize the content of studies, coders used a procedure similar to other syntheses (Khalifa et al., 2016; Thomas & Berry, 2019) by conducting a directed content analysis (Hsieh & Shannon, 2005). In essence, as described by Thomas and Harden (2008), coders took the step of 'going beyond' the content of the original studies in order to answer the current research questions, namely what academic interventions, practices, and supports have been implemented to improve academic

outcomes among minoritized students. Due to variability in language and theoretical frameworks for culturally responsive practice (Khalifa et al., 2016), directed content analysis was grounded in a synthesis of existing theory (rather than a single framework), in order to encapsulate a broader group of studies. The coder's intention was to employ a process that was flexible and iterative with the goal of including all relevant literature.

Specifically, all coded studies were first reviewed by the primary coder for categories of academic interventions, practices, and supports emergent in each study, referencing theories related to culture and education described previously (e.g., features of culturally responsive (Gay (1995) and culturally relevant pedagogy (Ladson-Billings, 1995)). Through review with this lens, analytical categories emerged to comprehensively describe the independent variables coded in the studies reviewed (Thomas & Harden, 2008).

Study categories aligned with three general topic areas. The first pertained to demonstrations of partnerships with stakeholders outside of the classroom, termed *partnering with families and community members*. This category aligned with Ladson-Billings' (1995) conceptualization of culturally relevant pedagogy, which emphasizes establishing relationships with students' families. The second category pertained to practices and interventions delivered within the classroom, termed *using effective pedagogy*. Within this category, five sub-categories were identified. The first sub-category was the use of *empirically-supported instructional practices,* which aligns with Ladson-Billings' (1995) emphasis on the use of effective instructional methods and setting high expectations for student learning. The second and third sub-categories were *inquiry-based instruction* and *collaborative learning opportunities,* both aligned with Banks' (1973) conceptualization of knowledge construction (empowering students to generate their own knowledge) and equity pedagogy (which emphasizes using a variety of instructional methods and collaborative learning tasks). The fourth sub-category was *incorporating students'*

experiences/social context in instruction, aligning with Ladson-Billings' (1995) recommendation to build curricula that reflect students' culture as well as Paris and Alim's (2014) and Gay's (1995) guidance to affirm students' culture through instruction. Finally, the final sub-category within *using effective pedagogy* was incorporation of *technology* in teaching, which in many cases maximized opportunities for content integration, a term Banks' (1973) used to describe using examples, resources, and ideas for students' culture when teaching. The third and final category was termed *access to information and support* due to its focus on *professional learning communities* and staff *professional development.* Often, access to information and support provided educators with the knowledge and tools needed to educate the whole child and give students a voice, features of Gay's (2000) conceptualization of cultural responsiveness.

Once these categories were determined by the first author, another member of the research team reviewed all articles and categorized studies independently with the categories identified. Finally, a third member of the research team reviewed categorizations carefully. Consensus was reached for study categorizations across the three members of the research team, and all articles were then coded according to these final categories.

Effect size estimates were not calculated for quantitative studies for two reasons. First, the focus of this review is on synthesizing a broad literature. Using expanded search terms (in comparison to past reviews) to achieve this aim, fewer commonalities pertaining to specific independent and dependent variables were noted across studies. Also, the research questions focused on study characteristics and quality, not estimating the magnitude of intervention effect in studies reviewed, per se. Second, most studies did not meet WWC design standards. Many used a case study (non-experimental) design. According to the WWC, studies should meet WWC design standards (WWC, 2017a) before being reviewed with the evidence standards (WWC 2017b).

Results

As depicted in Table 1, most studies contained a quantitative group design (*n* = 17; 70.8%), followed by qualitative (*n* = 5; 20.8%) and single-case (*n* = 2; 8.3%) design. Overall, general education teachers served as implementers (*n* = 19; 79.2%) then principals (*n* = 4; 16.7%), researchers (*n* = 4; 16.7%), special education teachers (*n* = 3; 12.5%), and support staff or coaches (*n* = 3; 12.5%). Twenty studies (83.3%) reported the number of implementers (*M* = 11.7 *SD* = 16.0; range = 1 – 56), but only eight (33.3%) reported years of professional experience.

Approximately half (45.8%) of the studies occurred in elementary schools (*n* = 10), followed by high schools (*n* = 7; 29.2%) and middle schools (*n* = 6; 29.2%). One study occurred in a K-8 setting (Enyedy & Goldberg; 2004). One study did not report the number but rather the percentage of students by racial/ethnic background in the sample (Rodrigues, 2010). Of the 22 studies (91.7%) that did report, the number of student participants ranged from four to 4,600 (*M* = 782). Eleven studies (45.8%) reported the percentage of English Learner students (ELL; range = 14.0% – 100%). Additionally, while all the studies reported that they included more than 50% students from non-White racial backgrounds, one study (4.2%) indicated generally that the majority of students were from racially and ethnically diverse backgrounds (Powell et al., 2016).

All studies occurred in public schools (*N* = 24, 100%), in urban (*n* = 19; 79.2%) or rural (*n* = 2; 8.3%; Hitchcock et al., 2016; Powell et al., 2016) settings. Additionally, the majority of the studies took place in the general education classroom (*n* = 22; 91.7%), followed by a special education self-contained classroom (*n* = 1; 4.2%) or a separate room (*n* = 1; 4.2%). The academic intervention, support or practice was delivered in a schoolwide (*n* = 4; 16.7%), classwide (*n* = 15; 62.5%), small group (*n* = 3; 12.5%), or individual (*n* = 2; 8.3%) format.

In Table 2, the academic practices, interventions or supports used in each individual study are presented alongside overall findings from each paper reviewed. The subject of the academic practice or intervention included mathematics (*n* = 6; 25.0%), science/Science Technology

Engineering Math (STEM; *n* = 6; 25.0%), literacy (*n* = 3; 12.5%), social studies (*n* = 2; 8.3%), or multiple subject areas (*n* = 7; 25.0%). Table 2 also indicates the categories associated with each study reviewed, as determined during data analysis. Of the categories identified, using effective pedagogy such as empirically-supported instructional practices (*n* = 15; 62.5%) were utilized most often. These were practices deemed supported by evidence in the studies reviewed. Also, several studies offered collaborative learning opportunities (*n* = 11; 45.8%), integrated students' experiences/social context in instruction (*n* = 11; 45.8%), used inquiry-based instruction (*n* = 9; 37.5%), and incorporated technology (*n* = 6; 25.0%) into instruction. Many studies also investigated the impact of professional development on staff (*n* = 12; 50.0%) or the development of professional learning communities (*n* = 3; 12.5%) on student outcomes. Still others studied the impact of partnering with families and community members (*n* = 7; 29.2%). Only five studies assessed and reported implementers' treatment fidelity data. One study included implementer self-report data (Capraro, 2016). The other four studies included direct observation of implementers' treatment fidelity (Hitchcock, 2016; Lee, 2005; Shumate et al., 2012; Valenzuela, 2004).

Review of Study Quality

Group and Single Case Design Studies

None of the 17 group design studies met the WWC eligibility criteria (WWC 2017a); therefore, no group design studies were reviewed using the WWC design quality standards or levels of evidence (WWC 2017b). The majority of group design studies were disqualified at screening due to ineligible study design (*n* = 14; 82.4%). In addition, one did not use an eligible outcome variable (i.e., Sampson & Garrison-Wade, 2011), one was published over twenty years from the review date (i.e., Bianchini, 1997), and one did not sufficiently link outcome measures to the intervention (i.e., Ross et al., 2007).

Single case design studies that met eligibility criteria (WWC, 2017a) were evaluated for design quality and evidence using *WWC Standards Handbook* (WWC, 2017b). Of the two single-case design studies, one study (Valenzuela, 2014) did not meet design standards as it did not include at least three attempts to demonstrate an intervention effect across cases within the study. The other study (Shumate et al., 2012) met the WWC eligibility criteria and all cases (n = 5; 100%) within the study met design standards, demonstrating strong evidence overall.

Qualitative Study Review

Each qualitative study that met inclusionary criteria (n = 5) was coded according to the 10 quality standards outlined by Brantlinger et al. (2005), defined briefly in Table S1 in supplemental materials. Specifically, the use of triangulation, thick description, particulazability, and collective work were strengths of all qualitative studies reviewed (N = 5; 100%). Most studies (n = 4; 80%) also included external auditors or peer debriefing, an audit trail, and prolonged field engagement. Fewer studies utilized disconfirming evidence, researcher reflexivity and member checks.

Discussion

This paper presents a synthesis of studies published over a 20-year period in which researchers investigated a culturally responsive classroom intervention or practice to promote academic outcomes for racially and ethnically minoritized youth. Search and screening procedures resulted in 24 studies reviewed, the majority of which utilized quantitative methodology albeit with substandard methodological rigor. This indicates that although there is emerging evidence related to culturally responsive practices to promote academic outcomes, additional high-quality studies are needed to continue to build a robust literature base that addresses the unequal distributions of access and opportunity historically experienced by racially and ethnically minoritized youth in schools.

As described in the Results, across studies, implementers were primarily general education teachers with various years of professional experience. Students in the studies reviewed ranged from elementary to high school-aged, with many studies including students determined to be ELs. Also, most studies reported that student participants were Latinx/Hispanic or Black. The percentage of student participants with disabilities was less often reported.

Types of Accommodations, Supports, and Intervention Practices

Studies reviewed targeted outcomes in several instructional areas: math, science/STEM, social studies and history, literacy, as well as across two or more instructional areas. Researchers often measured student achievement or content knowledge in specific topic areas. Although the academic supports provided across studies varied, three main categories emerged.

Partnering with Families and Community Members

Many studies described ways in which family and community members partnered in providing academic supports to youth. These partnerships appear to lay the foundation upon which effective classroom supports can be provided. In some instances, family and community involvement included information gathering or sharing. Sampson and Garrison-Wade (2011) offered families the opportunity to come to school and learn about culturally relevant history lessons prior to their implementation. Ross et al. (2004) described parents' high satisfaction with Direct Instruction implemented to improve achievement scores, indicating parents were poised to advocate to the school district to continue to fund training teachers to use the approach.

In other studies, families were encouraged to be more active participants in the delivery of academic supports to students (e.g., parent-implemented literacy instruction at home in addition to school; Ross et al., 2004). In one study, Moon and Callahan (2001) involved community members in mentoring students in the classroom (i.e., acting as tutors, advisors, "encouragers"; p. 310) and were invited to formal family outreach efforts. Community members were also included in

monthly meetings with families and annual day-long family empowerment seminars. Braun and colleagues (2016) described the use of community partnerships to create connection and foster students' feelings of safety in and outside of school. The authors indicated the value of community members celebrating students' achievements toward long-term goals, and how adults in the community should take collective responsibility for student success.

Although there was no universal approach to partnering with families and communities that emerged from results of the review, many of the efforts made by researchers illustrate the importance of collaboration central to Ladson-Billings' (1995) conceptualization of culturally relevant pedagogy. Furthermore, Banks (2008) indicated connections built between home, school and community strengthen the school culture and social structure, and encourage individuals to set high, attainable expectations for youth that ultimately lead to student success. Based on findings from this review, families might be actively engaged by participating in collaborative school trainings, communicating with educators, and providing data to inform educators' effort.

Using Effective Pedagogy

Studies described pedological approaches such as empirically-supported instructional practices, inquiry-based instruction, and providing collaborative learning opportunities.

Use of Empirically-supported Instructional Practices. Many studies described the value of effective practices to promote learning. These included engaging students in instructional goal-setting (Braun et al., 2016), peer tutoring (Olson, 2011), strategy instruction (Hitchcock et al., 2016), multisensory methods (Valenzuela et al., 2014), discourse about academic content (Lee et al., 2005), and using academic language in communicating ideas (Powell et al., 2016). It is unclear if these empirically-supported practices were indeed effective in the current studies reviewed, especially when treatment fidelity was largely unknown. For example, in a comparison study of Direct Instruction and Success for All, the authors reported implementation was uneven, and as a

result, relatively ineffective (Ross et al., 2004). Researchers who described more favorable outcomes often integrated supportive instructional practices with inquiry-based instruction or opportunities for collaborative learning in the classroom.

Inquiry-based Instruction. Some studies evaluated efforts to structure the learning environment such that students learned by answering questions or solving problems. This approach aligns with Banks' (1973) concept of knowledge construction. Braun and colleagues (2016) described inquiry-based learning as a "productive struggle" (p. 391) that promotes the brain's ability to process complex information. This was evident across subject areas, but most commonly for studies in science or STEM classrooms. In many of the studies, students learned academic content by working to solve problems reflective of the real-world, their lived experience, and/or their cultural background (e.g., Cuevas et al., 2005; Duffin et al., 2016; Enyedy & Goldberg, 2004). Boaler and Staples (2008) found that students achieved more when exposed to an open, applied mathematics curriculum in which teachers posed sophisticated conceptual problems to heterogenous groups and guided problem-solving through questions (versus when students were taught via more traditional lecture and practice). In addition, Enyedy and Goldberg (2004) reported that when students were enlisted as co-inquirers with their teachers, they demonstrated greater content knowledge at the end of a lesson.

Collaborative Learning Opportunities. Some of the studies that utilized inquiry-based instruction to offer students the opportunity to work collaboratively (e.g., Bianchi, 1997; Boaler & Staples, 2008; Duffin et al., 2016), which may be valued in cultures with collectivist orientations (Storlie & Toomey, 2016). In other studies, collaborative tasks were for the purpose of creating a product or artifact of learning (e.g., piece of writing; Woodrich & Fan, 2017). Capraro et al. (2016) described creating collaborative learning opportunities by utilizing a project-based learning framework. Students worked to arrive at a "well-defined outcome" from an "ill-defined task" (p.

184). The work is meaningful to students and the products are authentic. Examples of collaborative learning opportunities included selecting which summer jobs will pay the most considering the cost of resources needed (transportation, uniforms) and applying to those jobs, as well as developing a remediation plan to implement after an assessment of pollution sources present in the community. Engagement with instruction comes from applying academic content to students' environment, incorporating students' experience, and making material relevant.

Students' Experiences/Social Context in Instruction. Several researchers described the benefits of making material relevant to students' experience and social context. In a study by Sampson and Garrison-Wade (2011), students identified primarily as African American and Latino and were taught non-culturally relevant and culturally relevant history lessons to determine which was preferable. Both types of lessons included a multi-instructional approach with similar features: group work, movement, technology, and student-led discussions. An example of a non-culturally relevant lesson targeted learning about Ellis Island and included a video presentation and a discussion of how immigration then led to their diverse community population now. An example of a culturally relevant lesson on the Declaration of Independence included hip hop and poetry in the content delivery which was then integrated into student technology-based presentations afterward. Students preferred the lessons designed to be culturally relevant. In another example, recently immigrated students were taught to engage in historical thinking using primary sources and permitted to compose answers to questions in their first language (i.e., Spanish) or English. Incorporating students' primary language in instruction was also used to engage students in science instruction in the study by Cuevas and colleagues (2005) and demonstrated valuing students' primary language in the classroom (Seals & Peyton, 2017).

Technology. Finally, researchers integrated technology into the delivery of pedagogical content to facilitate academic engagement and promote knowledge construction. For instance, one

study found that students with emerging English proficiency preferred to remain anonymous while working on a collaborative writing task with peers by using a shared Google Doc (Woodrich & Fan, 2017). In another study, students preferred lessons in which teachers integrated cultural examples using technology (e.g., videos, songs) to stimulate interest and discussion (Sampson & Garrison-Wade, 2011). Findings from still another study demonstrated that the use of technology (e.g., visuals, software) to write multimodal lab reports improved students' knowledge of science material (Hitchcock et al., 2016). Although technology might be considered a tool rather than a practice, use of technology can promote engagement and participation in class (Hitchcock et al., 2016; Woodrich & Fan, 2017), support the incorporation of students' culture in instruction (Ladson-Billings, 1995), and lead to meaningful discussions about social and political consciousness (Banks, 2006; Sampson & Garrison-Wade, 2011).

Overall, the classroom supports described in the articles reviewed included many hallmarks of a multicultural instructional framework: (a) cooperative, interactive, flexible learning environments, (b) relevant instructional content, and (c) opportunities for students and teachers to work together to achieve a common goal (Banks & Banks, 1995). In addition, use of home language in some of the studies reviewed aligned with recommendations put forth by Seals and Peyton (2017). Yet only some studies reviewed provided an explicit description of any support in the classroom to acknowledge the dominant discourse in society, and to teach students "power literacy" (Delpit, 2006). Also, no study overtly utilized *culturally sustaining pedagogy*, prioritizing linguistic and cultural pluralism in the classroom (Paris & Alim, 2017). This indicates an area in which teachers might benefit from training, as well as a topic for additional research.

Access to Information and Support

Articles discussed the use of professional learning communities and professional development to change educators' practice.

Professional Learning Communities. Three studies reviewed described the utility of professional learning communities (PLCs) to support teachers' implementation of culturally responsive academic practices. Huggins and colleagues (2011) described how PLCs with science and math teachers were used to transform instruction in an urban school. The aim of these communities was to engage in meaningful collaboration with one another to make strides toward incorporating culturally responsive practice (e.g., building relationships, using effective teaching strategies). During PLC time, teachers determined which students were learning and which were not, and collaboratively planned how to provide additional supports to those who needed it. Authors purported this was the first study to link PLC planning to change in teacher practices that promoted increased student achievement. Similar results were found for both Braun et al. (2016) and Capraro et al. (2016). Specifically, PLC time encouraged the use of collaboration and effective instruction incorporating culturally responsive practice in the classroom, often supported by sustained professional development (PD) at the school or district level (Capraro et al., 2016).

Professional Development. Many studies described sustained PD (e.g., 1 – 3 years, Rodriguez, 2010) to support educators to learn and implement culturally responsive practices in the classroom. This included the opportunity to engage in targeted trainings and workshops (e.g., Lee et al., 2005), critical discourse on instructional planning (e.g., Powell et al., 2016), and/or written self-reflection about classroom practice (Young, 2010). Trainers offered support to teachers to develop and maintain classroom relationships, collaborate with families, plan meaningful and relevant instruction, and explore and integrate diverse perspectives into curricula – practices paramount toward being responsive to student culture in the classroom (Powell et al., 2016). Results of studies reviewed provided additional evidence that ongoing, high-quality PD is vital to support teachers to engage in equity pedagogy (Banks & Banks, 1995) and transform educational systems to be culturally responsive (Klingner et al., 2005).

Study Quality

When evaluating results, it is important to consider the rigor of study methods to determine whether results of qualitative studies are trustworthy and data from quantitative studies are reliable and valid (Maher et al., 2018). In the current review, qualitative research reviewed incorporated many of the features of study quality outlined by Brantlinger et al. (2005), supporting the credibility of findings. However, quantitative research reviewed largely did not meet criteria for study quality outlined by the WWC. Indeed, only one single case design study reviewed met quality standards and demonstrated strong evidence (Shumate et al., 2012), and most group design studies did not employ an eligible study design (often due to the lack of a control group or a small sample; e.g., Cuevas et al., 2005). This indicates there is a dearth of rigorous, replicable research evaluating academic practices to support minoritized youth in the literature base. As described below, future research must prioritize designing studies with sufficient methodological rigor to fully evaluate the potential of these practices to promote academic outcomes for racially and ethnically minoritized youth.

Limitations

Results should be interpreted with consideration of a few limitations. First, this systematic review included specific inclusion criteria. Studies were required to be qualitative or quantitative (group design, single case design) in nature, and to include an intervention or support to impact an academic dependent variable. This eliminated theoretical papers or research articles that targeted teacher training or classroom practice only without measuring its impact on student outcomes. Also, authors had to describe the study as one that aimed to support students from diverse backgrounds in order for the study to emerge in the search. Studies that did not do this explicitly may not be included in the review, highlighting the importance of clear study descriptions (particularly in paper abstracts) in order to locate relevant articles. This is critically important for

educators in the field who might look to the literature base for guidance and may not be able to locate pertinent articles easily.

Relatedly, the review included studies for which 50% or more of the sample were racially and ethnically minoritized youth. This cutoff was intentional as much of the intervention research available in the literature includes samples with a large proportion of White students (e.g., Same et al., 2018) and this review contained research questions targeted studies for which a majority of students identified as racially and ethnically minoritized. Without this cutoff, additional studies may have been identified, yet this would not have answered the research questions specifically.

Also, the purpose of the review was to determine the breadth and quality of research published over a 20-year period. However, this meant that some studies reviewed in the current synthesis were published before quality standards were available from WWC and Brantlinger et al. (2005). Hence, although there are a fair number of empirical studies of academic supports to benefit minoritized youth published since 1997, research remains largely preliminary and non-experimental. Relatedly, review of quality for quantitative studies focused explicitly on methodological rigor and did not evaluate which features of the design or method in studies reviewed led to reduced study quality. In addition, studies published prior to 1997 were not reviewed, which may have missed work from the early 1970s upon the publication of Banks' (1973) seminal text or the passing of the first iteration of IDEA (2004), the *Education for All Handicapped Children Act* (Public Law 94-142), in 1975.

Furthermore, the coding manual used was not validated systematically (e.g., from scholars and practitioners external to the research team) before screening and reviewing existing studies. This may have unintentionally introduced bias into the review process. Also, three members of the research team were involved in the independent review and categorization of studies to reach consensus, yet it is possible that other researchers may have determined different categories upon

review of study findings. Finally, as the independent and dependent variables were different across studies, it was not possible to calculate effect size estimates to compare results quantitatively. Therefore, it is not possible to draw conclusions about intervention effectiveness across studies.

Implications

Implications for Future Research

The purpose of this review was to synthesize recent research pertaining to culturally responsive academic supports, yet future reviews may vary the procedure to include additional studies. For instance, a replication might target a lower threshold (or no restriction at all) with regard to the percentage of the sample identified as racially and ethnically minoritized youth. In addition, researchers might not impose a restricted range for year of publication to include studies published before 1997 or since 2018. It may also be beneficial to have input from external researchers when devising and validating a manual to use to code studies and categorize findings to reduce the threat of bias. Furthermore, future reviews might target studies with a common dependent variable (e.g., reading scores) to allow for a more comprehensive quantitative analysis.

Based on results of the current review, there were gaps in details reported in studies reviewed relative to participants and the supports provided. For instance, in the studies reviewed, it was not always clear how many years of experience implementers had. Including years of experience in these studies would allow researchers to explore if individuals with more experience were providing academic supports for minoritized students systematically. It could be that teachers with more experience were able to provide these supports with greater fluency or more success, but without these data, meaningful comparisons are not possible. Also, many studies did not report information related to student disability status. As the purpose of the review was to synthesize findings to support cultivating rigorous, culturally responsive learning environments to address

disproportionate representation of racially minoritized youth in special education, these data were not critical, but having this information would support a more comprehensive synthesis.

This lack of standard reporting practices regarding implementer, setting, student, and intervention characteristics may impede continued research on culturally responsive practice. Adequate reporting should include replicable descriptions of study and intervention procedures, as well as sufficient contextual information to aid interpretability. In addition to improved reporting practices, this review reflects inconsistencies in the language used to study culturally responsive academic practices across the field, which has important implications for continued research. While all studies reviewed focused on minoritized students, not all studies explicitly labeled practices as "culturally responsive", and those that did, often used variable wording. Clear, consistent language may help researchers better understand the impact of existing culturally responsive practice and pave the way for future researchers to better align their work.

Implications for Practice

Many of the studies reviewed included supports or interventions explicitly described as culturally responsive (Powell et al., 2016; Shumate et al., 2012), but it is important to note that stakeholder feedback is necessary to deem a practice relevant or responsive to an individual's culture (e.g., Sobel et al., 2011). Cultural responsivity is a transactional process. In fact, cultural responsiveness can offer teachers the opportunity to co-construct knowledge with students (e.g., engage in cogenerative dialogue) which can encourage student participation in instruction, and allow teachers to learn more about students' culture and their needs (Lawrence, 2020).

In addition, findings from this review highlight the importance of (a) family and community partnerships, (b) effective pedagogy in the classroom that integrates student culture explicitly and uses a constructivist approach to teaching, and (c) access to high-quality

professional development and learning communities. Within these areas of practice, there are several implications for teachers, in addition to school and district leaders.

First, teachers might consider the extent to which the classroom environment, expectations, lesson content and curriculum design reflect these features and take steps toward change. One way to start this is by learning about students' interests, values, traditions and beliefs. Fostering connection with students (and families) will likely increase students' sense of belonging and feelings of safety (Braun et al., 2016). This might promote engagement in the learning environment, and ultimately student academic success.

Second, school and district leaders might consider implementing school and district-wide structures to support teachers' access to high quality professional development and learning communities, as well as community partnerships. Professional development aimed at teaching practices such as integrating student culture and home-language, collaborative learning activities, and use of technology, may offer the training and support teachers need for effective use of these strategies. Moreover, the development of professional learning communities, across schools or districts, offer teachers the opportunity to build knowledge and skills among their peers. Finally, while teachers may individually partner with community organizations or resources, forging these partnerships at the school or district level, as in many of the studies reviewed, may enable more sustainable and comprehensive community-school engagement.

Together, school leaders and educators can build these culturally responsive academic practices into daily classroom routines. Individual changes in teaching practice, as well as advocacy for systemic change, will support all students, specifically minoritized youth who face marginalization and systemic barriers to academic achievement in schools.

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Table 1

Implementer and Student Characteristics

	Implementers			Students					
Study	Type of Teacher or Staff	Number	Years of Experience	Grade Level	Students	% EL[1] Students	% Minoritized Youth[2]	# Students Disabilities	Disability category
Single Case Design Studies									
Shumate et al. (2012)	Resource Room Teacher	1	3	M	5	100%	L (100%)	5	SLD*
Valenzuela et al. (2014)	Researcher	1	N/R	E	4	N/R	L (75%), B (25%)	0	---
Group Design Studies									
Bianchini (1997)	Gen Ed	N/R	N/R	M	43	N/R	L (58%), A (24%), B (4%)	N/R	N/R
Boaler & Staples (2008)	Gen Ed	8	N/R	H	4,600	17%	L (32.2%), B (20%), NH (20%)	N/R	N/R
Capraro et al. (2016)	Gen Ed	56	4.32 (avg)	H	3,801	14%	L (51%), B (35%)	N/R	N/R
Cuevas et al. (2005)	Gen Ed	7	7-24 (range)	E	28	46%	L (57%), B (18%)	N/R	N/R
Duffin et al. (2016)	Gen Ed	1	N/R	H	51	N/R	L, B, A (75%)	N/R	N/R
Enyedy & Goldberg (2004)	Gen Ed	2	> 10	E, M	54	61%	L (97%)	N/R	N/R
Fránquiz & Salinas (2011)	Gen Ed	1	N/R	H	11	100%	L (100%)	N/R	N/R
Hitchcock et al. (2016)	Gen Ed; Coach	7	6–10 (n = 2) >10 (n = 5)	M	46	N/R	NH (76%), A (9%), B (2%)	4	N/R
Lee (2005)	Gen Ed	53	N/R	E	1,523	N/R	L (56%) B (17%), A (2%), H (14%)	N/R	N/R

Moon & Callahan (2001)	N/R	N/R	N/R	E	120	N/R	B (64%), L (4%), A (7%) M (4%)	N/R	N/R
Olson (2011)	N/R	N/R	N/R	E	80	60.0%	L (86%), B (13%)	N/R	N/R
Powell et al. (2016)	Gen Ed; SpEd	25	N/R	E	456	28.0%	---	N/R	N/R
Rodriquez (2010)	Gen Ed	9	N/R	E	N/R	43.5%	L (68%), B (5%), A (2%), M (10%)	N/R	N/R
Ross et al. (2004)	N/R	N/R	N/R	E	3,523	N/R	B (Varied)	N/R	N/R
Ross et al. (2007)	Gen Ed; SpEd	5	N/R	E	49	N/R	B (100%)	N/R	N/R
Sampson & Garrison-Wade (2011)	Gen Ed; Principal	3	N/R	H	45	N/R	L (56%), B (40%), A (4%)	N/R	N/R
Woodrich & Fan (2017)	Gen Ed	1	N/R	M	97	30.0%	L (61%), O/M (39%)	N/R	N/R
Qualitative Studies									
Braun et al. (2016)	Gen Ed; Support	23	N/R	M	140	N/R	L (51%), B (12%), O/M (5%), NA (1%), A (1%)	N/R	N/R
Gutstein et al. (1997)	Gen Ed; Principal	9	N/R	M	743	N/R	L (99%)	N/R	N/R
Huggins et al. (2011)	Gen Ed; Principal	9	2 – 3 (n= 4); >10 (n = 2)	H	700	N/R	L (49%), B (35%), A (1%)	N/R	N/R
Rubel (2012)	Gen Ed	7	1 – 8	H	420	14.0%	School 1: L (75%), B (25%) School 2: L (10%), AA (90%)	N/R	N/R
Young (2010)	Gen Ed; SpEd; Principal;	7	2 –3 (n = 2); 6–10 (n=2); > 10 (n = 3)	E	220	N/R	L (40%), B (40%), A (5%), O/M (3%),	N/R	N/R

Note. [1]EL = English Learner; [2]L = Latinx/Hispanic; B = Black; W = White; NH = Native Hawaiian; MR = multiple races; AI = American Indian; A = Asian; O/M = Other or Multiple races; H = Haitian; SLD = specific learning disability

Table 2

Review of Studies by Content Area and Summary of Categories and Findings

Content and Study	Variables Measured	Categories[1]	Study Summary
Math			
Boaler & Staples (2008)	Content-aligned tests; open-ended project assessment; standardized state assessment; relationships with math; type of teacher questions; time allotment of lessons	EIP, IBI, CL	• Investigated an "equitable teaching approach" for high school math • Created heterogenous student groups • Teachers asked questions instead of lecturing
Gutstein et al. (1997)	Student work; curricular materials; teacher and student behavior and perspectives related to student knowledge, culture, and critical thinking skills	EIP, SE	• Investigated "culturally relevant mathematics instruction" • Teachers built upon students' experiential knowledge and taught critical mathematical thinking • Empowered students to "develop personal and social agency"
Huggins et al. (2011)	Standardized state assessment; student work; meeting minutes and agendas; teacher notes; lesson plans; classroom observations; student and teacher self-report	CL, PD, PLC	• Created a PLC for math and science teachers to promote project-based learning • Provided district-level PD to implement PLCs to increase student achievement
Rubel & Chu (2012)	Observed frequency and type of opportunities for math learning; classroom observation inventory; cognitive demand of math lessons	EIP, SE	• Provided PD for "culturally relevant mathematics pedagogy" • Centered instruction around students' experiences
Shumate et al. (2012)	Student scores on daily math quizzes; teacher acceptability questionnaire	EIP, CL, SE	• Teacher provided "culturally relevant instruction" during math by using culturally relevant examples and effective instructional strategies
Valenzuela et al. (2014)	Accuracy on curriculum-based measurement	EIP	• Provided targeted, supplemental mathematics intervention (Touch Math) • Preliminary case study data support improvement in math computation.
Science and STEM			
Bianchini (1997)	Open-ended science unit tests; student behavior during groupwork; students' self-reported experiences of group-work	IBI, CL, SE, PD	• Investigated small group work as a social activity, context for learning science, and means for eliminating barriers to scientific inquiry • Found students with higher "status" in the classroom participated more in groups and learned more science content
Capraro et al. (2016)	Standardized state assessment; teacher-reported experiences with PLCs, PD, and project-based learning	IBI, CL, PLC, PD	• Provided teachers with sustained PD which focused on establishing PLCs and STEM project-based learning. Students scored higher on state tests.
Cuevas et al. (2005)	Elicitation protocol with scientific problem-solving tasks	IBI, SE, PD	• Teachers designed inquiry-based activities for science and included students' home languages and cultures. • Students' ability to engage in science inquiry improved, especially for low-achieving students.

Duffin et al. (2016)	Student-reported interest in and utility value for chemistry; summative assessment of chemistry knowledge	IBI, CL, SE	• Three-week, inquiry-based chemistry project • Intervention increased students' utility value for chemistry and intention to study it in the future, as well as their performance on the chemistry assessment.
Enyedy & Goldberg (2004)	Observed classroom roles, rules, and participation; test of scientific content knowledge	FCP, EIP, IBI, TECH, PD	• Analyzed inquiry-based science lessons and teacher-student discourse in two classrooms • Found that one teacher, who taught with students as co-inquirers and used more inclusive pronouns, had students with more knowledge at end of the unit
Rodriquez (2010)[3]	Student concept maps on scientific thinking and knowledge; teacher-reported experiences with the intervention	IBI, SE, TECH, PLC, PD	• Teachers participated in a PD to establish a responsive and ongoing community of practice. • Students showed increased content knowledge.
Social Studies			
Fránquiz & Salinas (2011)	Student work (writing); observed student interactions; standardized state assessment	SE, TECH	• Used primary sources during social studies lessons for U.S. newcomers • Teachers taught historical thinking via digitized primary sources and document-based questions. • Provided the choice to write in either English or Spanish. • Native language supports significantly contributed to students' historical thinking and understanding
Sampson & Garrison-Wade (2011)	Student feedback forms and focus group on perceptions of each lesson	FCP, EIP, IBI, SE, TECH	• Compared "culturally relevant" and "non-culturally relevant" American history lessons. • African American children preferred culturally relevant lessons.
Literacy			
Olson (2011)	Reading fluency accuracy; reading fluency rate	EIP, CL	• Investigated a preferential instruction and peer tutoring intervention for 2nd graders • Lower performing readers gained fluency and accuracy
Ross et al. (2004)	Standardized state assessment and other inventories; focus groups and observations of teacher-student relationships and intervention experience	FCP, EIP	• Evaluated impact of Success for All and Direct Instruction (DI) • Inconclusive effects were found on student achievement and school climate, likely due to "uneven" implementation despite positive program perceptions
Woodrich & Fan (2017)	Student attitudes toward writing; quality and number of student writing contributions during group-work	CL, TECH	• Investigated use of anonymous collaborative writing in Google Docs among 8th grade students • Students with different language fluencies participated more equitably when they were able to remain anonymous during writing tasks; face-to-face writing tasks had the highest scores; students liked Google Docs for writing activities.

Multiple Subject			
Braun et al. (2016)	Attendance; GPA; Credits earned; Focus Groups related to student perceptions of the intervention	FCP, EIP, PD	• Evaluation of the Urban Collaborative Accelerated Program. • Positive perceptions of the program included teachers as warm demanders, positive school community climate, as well as efforts to promote student self-efficacy and uphold diversity. • Quantitative analyses revealed an association with the program and high school achievement.
Hitchcock et al. (2016)	Curriculum-based measurement, Woodcock Johnson III Writing; survey and focus groups about writing process	EIP, TECH	• Developed 12-week expository writing intervention for science using technology. • Students' writing skills improved.
Lee et al. (2005)	Writing samples; unit tests; standardized national and international assessment items	EIP, IBI, CL, SE, PD	• Instructional intervention targeting literacy and science emphasizing students' culture. Science and literacy performance improved, especially for 4th graders.
Moon & Callahan (2001)	Iowa Tests of Basic Skills	FCP, EIP, CL, SE, PD	• Investigated mentoring, parental involvement, and multicultural curricula • No effect was found on student achievement, yet more students were selected for the gifted program and demonstrated improved problem solving and social skills.
Powell et al. (2016)	Classroom observations using the *Culturally Responsive Instruction Observation Protocol* (CRIOP); teacher interviews; computerized assessment of reading and math aligned with state standards	FCP, EIP, IBI, PD	• Examined the CRIOP and related professional development • Teachers demonstrated increased culturally responsive instruction, and better student achievement resulted.
Ross et al. (2007)	School climate observations; surveys, interviews, and focus groups with stakeholders; standardized student assessment in literacy and math	FCP, EIP, PD	• Investigated a schoolwide comprehensive school reform intervention. • In the first year of implementation in one middle school, positive effects were found on student academic achievement and school climate.
Young (2010)	Classroom observations, interviews, inquiry group meetings, follow-up meetings, reflections, documents, online discussions, researcher's field notes.	PD	• Implemented and evaluated *culturally relevant pedagogy* (CRP) in one urban school over a three-month period. • Findings included pervasive confusion about CRP, cultural and racial bias at both individual and systemic levels, and lack of implementation support.

Note. [1]Categories included FCP = partnering with families and community members, EIP = empirically-supported instructional practices, IBI = inquiry-based instruction, CL = collaborative learning, SE = students' experiences/context, TECH = technology, PLC = professional learning communities, PD = professional development; [2]Hitchcock et al. (2016) assessed writing and science, Lee et al. (2005) assessed literacy and science, Moon & Callahan (2001) assessed language arts and math, Powell et al. (2016) assessed math and reading, Ross et al. (2007) assessed language arts, reading, writing, math, Young (2010) assessed language arts and math; [3]Rodriquez (2010) included a community of practice which was categorized as a PLC.