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Abstract: A review of studies published from 2000 to 2012 was conducted to describe the literacy skills of underprepared postsecondary students, identify teaching approaches designed to bring their skills to the college level, and determine methods of embedding developmental instruction in college-level course work. The studies pinpointed numerous weak areas in students' skills, but it was found that certain reading and writing processes have been overlooked in the literature. Thirteen studies of the effects of instruction were found, most of which focused on strategy instruction or "meaning-making." The research tended to lack rigor, but five instructional studies reporting relatively robust data were identified. The main finding of the review is that, because of the lack of a sustained research agenda to date, as well as methodological flaws in existing studies, there is still much to be learned about the literacy skills of underprepared students. Eight areas for future investigation are suggested. [ABSTRACT FROM PUBLISHER]

Literacy Skills Among Academically Underprepared Students

A review of studies published from 2000 to 2012 was conducted to describe the literacy skills of underprepared postsecondary students, identify teaching approaches designed to bring their skills to the college level, and determine methods of embedding developmental instruction in college-level course work. The studies pinpointed numerous weak areas in students' skills, but it was found that certain reading and writing processes have been overlooked in the literature. Thirteen studies of the effects of instruction were found, most of which focused on strategy instruction or "meaning-making." The research tended to lack rigor, but five instructional studies reporting relatively robust data were identified. The main finding of the review is that, because of the lack of a sustained research agenda to date, as well as methodological flaws in existing studies, there is still much to be learned about the literacy skills of underprepared students. Eight areas for future investigation are suggested.

Keywords: curriculum and instruction; remedial/developmental education

Low reading and writing skill among a sizable proportion of postsecondary students has been an ongoing concern in the United States since the 1970s, when open admissions policies were instituted in many publicly funded colleges across the country. Reasons for academic underpreparedness at the postsecondary level include inadequate instruction during the K-12 years (Carnegie Council on Advancing Adolescent Literacy, 2010), low English language proficiency (Becket, 2005), learning disabilities (Mull, Sitlington, & Alper, 2001), low motivation (Dean & Dagostino, 2007), and barriers associated with low socioeconomic status and minority race and ethnicity (Attewell, Lavin, Domina, & Levey, 2006). Students assessed as having low skill on entry are usually advised to enroll in developmental education, which aims to improve skills and study behaviors (Boylan, 2002). State education departments are increasingly designating community colleges as the primary location of developmental education within higher education. Approximately 44.5% of community college students enroll in at least one developmental course (Staklis, 2010, Table 6) but as many as 60% of incoming students may be academically underprepared (McClenney, 2009). National statistics rarely disaggregate developmental enrollments by subject area, which makes it difficult to estimate the current size of literacy (reading and writing) versus math enrollments. However, in the year 2000, about 20% of community college students enrolled in developmental reading or writing courses (Parsad & Lewis, 2003).

The persistence and graduation rates of students who enter community colleges with low skills are extremely low (Bailey, Jeong, & Cho, 2010), and the effectiveness of developmental education has been questioned (Scott-Clayton & Rodriguez, 2012). Various reforms have been suggested, including embedding developmental instruction in college-credit course work rather than teaching the skills in stand-alone courses (Bailey, Hughes, & Jaggars, 2012; Carlson, 2011; Complete College America, 2012; Edgecombe, 2011). A better understanding of how student demographics, entering academic ability, and individual pathways through college are related to persistence and graduation (Bahr, 2013; Bremer et al., 2013) will suggest the types of instruction and supports for reading and writing needed by underprepared students.

Instructional improvement is a critical part of efforts to improve educational outcomes for underprepared students (Lesgold & Welch-Ross, 2011). The purpose of this article is to review literature on the reading and writing skills of underprepared post-secondary students, and on instructional approaches designed to improve those skills. The review addresses the following questions: What is known about the reading and writing skills of academically underprepared college students? What instructional approaches have been found effective? How might developmental reading and writing instruction be embedded in college-level coursework? To

provide context, a framework for understanding reading and writing skills, and an overview of instructional approaches, are provided in the remainder of this introduction. The literature review follows this material.

Reading and Writing Skills

As the present literature review focuses on reading and writing, it is useful to consider the nature of these two skills. A prominent theory of reading proposes that reading comprehension derives from two components, decoding, or accurate and rapid deciphering of words on the page, and linguistic comprehension, or the ability to understand language. When both of these functions are operating smoothly, the reader can understand printed language on the page (Gough & Tunmer, 1986; Macaruso & Shankweiler, 2010). Because, in fact, many students, including some who have entered postsecondary education, are not fluent in one or both components of reading (Lesgold & Welch-Ross, 2011), they need to be taught. A number of studies in the current literature review focus on decoding and reading comprehension skills in low-skilled post-secondary students.

As with reading, writing skill is also considered to result from the smooth operation of component skills, in this case, planning, composing, and revising text in a process that is simultaneous and recursive, so that these three actions are closely interwoven as writing unfolds (Flower & Hayes, 1980). Writing skills are just as important to academic achievement as reading. Similarly, writing presents a great challenge for large numbers of students through the postsecondary level (MacArthur & Philippakos, 2012) and needs to be taught. Studies of writing skills among underprepared college students are included in the present review.

Despite the distinctive aspects of reading and writing, in practice the two skills are closely connected, and even inseparable in academic settings. However, although reading and writing share a range of cognitive processes, they are only moderately correlated, and have their unique requirements (Fitzgerald & Shanahan, 2000). At the same time, writing activity facilitates reading comprehension (Graham & Hebert, 2010), and reading well-written text can improve writing skill (Graham & Perin, 2006). It is a rare academic writing task that does not require reading, and the understanding of written course materials is typically assessed through writing activities. Despite this close relationship, reading and writing have traditionally been treated as separate domains, in research and instruction alike. This pattern may be changing, with recent research covering both reading and writing (Abbott, Berninger, & Fayol, 2010), writing across the curriculum (Melzer, 2009), and reforms whereby developmental reading and writing are taught in single courses (Edgecombe, 2011; Jackson, 2009). Whether reading and writing are taught together or separately, a number of different approaches have been taken in literacy instruction with developmental students, as summarized in the next section.

Instructional Approaches

Developmental education instructors vary widely in their teaching strategies (Perin & Charron, 2006), but no prior study has systematically categorized them. Two major approaches, skills-based and constructivist, have been described in previous literature (Grubb et al., 1999). The terms discrete skills and meaning making (Beder, Lipnevich, & Robinson-Geller, 2007) are used here to refer to these approaches. Discrete skills instruction refers to the explicit teaching of skills such as locating main ideas, making inferences, understanding vocabulary, and writing sentences and paragraphs. Textbooks typically used in developmental education classrooms (e.g., Langan, 2012; McWhorter, 2010) center on such skills, which are taught in isolation from each other. Meaning-making draws reading and writing components together by focusing on problem-solving and critical thinking, and by using authentic materials related directly to students' personal or academic needs and interests. To these approaches can be added strategy development. As in discrete skills

instruction, this approach utilizes explicit teaching of skills, but emphasizes modeling and guided instruction in a sequence of steps in a reading or writing task, often using cognitive supports such as graphic organizers and mnemonics (Caverly, Nicholson, & Radcliffe, 2004; MacArthur & Philippakos, 2012). Another approach is critical sociocultural instruction, which focuses on personal identity and social justice, and emphasizes challenges students face in their lives (Rose, 2005). Finally, learning communities are used, whereby developmental courses are clustered, sometimes with college-level courses, and students are taught as a cohort (Visher, Weiss, Weissman, Rudd, & Wathington, 2012). Although this is a structural rather than strictly pedagogical arrangement, linking curricula across courses affects instruction (Gabelnick, MacGregor, Matthews, & Smith, 1990). The five approaches just listed are not necessarily mutually exclusive but were utilized in the current literature review because they provide a useful organizing framework from which to view reading and writing instruction for underprepared students.

Method

The literature was searched for the years 2000 to 2012, and augmented by a few sources discovered in bibliographies of identified studies that were published earlier, and by one paper in the current issue. Research was identified using the ProQuest, ERIC, and Education Full Text databases; bibliographies of identified papers; the Cited Reference Search in the ISI Web of Science Social Science Citation Index; Google Scholar; and a handsearch of relevant journals. Literature considered for review consisted of peer-reviewed journal articles, technical reports from known agencies, doctoral dissertations, and scholarly books. For a study to be selected, participants had to be students in postsecondary degree or certificate programs and have low reading or writing skills, and results had to be reported on literacy skills or general academic achievement.

Studies were initially divided into three groups: those whose primary purpose was to report characteristics of the reading and writing of underprepared students, called "assessment studies"; those reporting instructional approaches; and work suggesting approaches to embedding developmental reading or writing skills instruction in college-level courses. The data in the assessment studies included test scores on standardized and researcher-designed measures, as well as qualitative data such as the findings from interviews with students. The research on instruction was further divided according to whether the research reported effectiveness (i.e., quantitative studies with pre-post testing and with a control or comparison group) or was descriptive (i.e., describing instruction but without controlled effectiveness data). Although descriptive studies do not, by definition, provide evidence of effectiveness, they can help assess the potential of an approach or suggest reasons for effects reported in controlled studies.

The author examined 239 studies, of which 43 met the selection criteria and were related to assessment or instruction: 14 on assessment, 13 reporting data on instructional effectiveness, and 16 descriptive studies of instruction. These 43 studies are listed and summarized in the appendix (fuller details are available from the author). It is noted that some of the studies included mathematics, but for the purposes of this article, only findings related to reading or writing skills are included. A separate search conducted for research related to embedding instruction in college-level courses identified an additional 14 studies, all of which were descriptive studies or literature reviews (Artis, 2008; Brittenham et al., 2003; Brockman, Taylor, Kreth, & Crawford, 2011; Fernsten & Reda, 2011; Gordon, 2008; Grubb, et al., 1999; Hock, Deshler, & Schumaker, 1999; Johnson, Garza, & Ballmer, 2009; Juchniewicz, 2007; Lei, Rhinehart, Howard, & Cho, 2010; Morris & Price, 2008; Perm, 2004, 2011; Stewart, Myers, & Culley, 2010). The next section of this article highlights the findings of the review of the assessment studies, the effectiveness studies, and the work on embedding developmental instruction in college-level courses.

Results

Reading and Writing Skills of Academically Underprepared College Students

The assessment studies pointed to weaknesses in a wide variety of reading and writing skills. Better readers outperformed poorer readers on oral and written comprehension, reading rate, frequency of re-reading test questions, written word recognition, phonological awareness, and familiarity with reading strategies (Laverpool, 2008; Martino & Hoffman, 2002; Shelton, 2006). Wang (2009) reported that only 55% of students could identify explicitly stated main ideas in text, 42% could comprehend implicit main ideas, and 11% of students were aware of a global main idea in text. Perin, Keselman, and Monopoli (2003) found that when students were asked to write a summary from source text, one third of the resulting sentences were copied directly from the text rather than paraphrased. However, higher and lower scoring readers in a sample of deaf students studied by Kelly, Albertini, and Shannon (2001) showed similar performance in identifying incongruent information and in summarizing and recalling information from text. Use of nonstandard English, incoherent writing, and lack of revision skills among both native and nonnative English speakers were reported by Becket (2005), Dunning (2009), and Scordaras (2009). Doolan and Miller (2012) analyzed writing samples produced by three groups of developmental writing students: native-English speakers; English language learners; and Generation 1.5 students, defined as students who spoke a language other than English in the home, received education in the United States for more than 4 years, and were fluent in oral English. The Generation 1.5 students had more errors on verbs, prepositional phrases, and word forms than the native speakers, and they made different types of verb errors from both the English language learners and native speakers.

The assessment studies also investigated relationships between affective and literacy variables. Text structure was found to influence students' self-efficacy for reading comprehension (McCabe, Kraemer, Miller, Parmar, & Ruscica, 2006) and reading comprehension level (Wang, 2009). However, some conflicting findings were reported on other affective variables. Jones (2008) reported that level of locus of control predicted students' grades and essay quality, while Randall (2008) found that motivational and self-regulation variables did not predict reading or writing achievement.

Many of the assessment studies were best viewed as producing exploratory rather than rigorous evidence, with sole reliance on researcher-designed measures with unknown levels of reliability and validity, small sample sizes, and nongeneralizable data (e.g., data collection confined to single institutions). Further, the quantitative studies often did not include student background variables that might have moderated outcomes.

Effective Approaches to Developmental Reading and Writing Instruction

The 13 studies of instructional effectiveness were distributed evenly across meaning-making, strategy instruction, and learning communities (four studies each), with one study of discrete skills instruction. No studies of the effectiveness of the critical socio-cultural approach were found, although this approach was reported in several of the descriptive studies. Four of the studies contextualized instruction within content text in science, psychology, philosophy, and other areas (Caverly et al., 2004; Martino, Norris, & Hoffman, 2001; Perin, Bork, Peverly, Mason, & Vaselewski, 2012; Snyder, 2002). The quality of most of the effectiveness studies was compromised by the same methodological flaws seen in the assessment studies, as well as by a lack of control for attention or novelty (i.e., comparison only with business as usual rather than alternate treatments), by instruction delivered by the author of the study, and by the administration of different measures for pre and posttesting.

Two meaning-making interventions and a study of tutoring in discrete reading skills in reading did not result in statistically significant prepost group differences on standardized reading tests (Martino, et al., 2001; Perin, et al., 2012; Willingham, 2009), although two of these studies did show significant gain on researcher-designed measures (Martino, et al., 2001; Perin, et al., 2012). Three of the five learning-community studies found little or no impact on persistence in college, or grade point average (Visher et al., 2012; Weiss, Visher, & Wathington, 2010; Weissman et al., 2012). Further, although Moore (2000) did find positive effects of a learning community, it would be difficult to attribute the effects of learning communities directly to instruction, because, first, the treatments involved dimensions (e.g., student bonding, faculty collaboration, financial incentives for participation) not received by control groups, and, second, the studies did not report whether or how instruction in the learning community classrooms was different from instruction in the control classrooms.

Relatively robust evidence of instructional effects comes from four strategy interventions (Caverly, et al., 2004; Friend, 2001; Hart & Speece, 1998; Snyder, 2002) and one meaning-making intervention (Rochford, 2003). Hart and Speece (1998) investigated the effects of reciprocal teaching, which uses teacher-student and student-student interaction to develop strategies for summarizing, clarifying, predicting, and asking questions about information in a text. Gains on a standardized reading comprehension test, a self-report study strategy measure, and a researcher-developed reading strategy measure were superior for reciprocal teaching compared to a cooperative learning comparison group, with a modest effect size of d = 0.30 on the standardized reading test.

Snyder (2002) taught three reciprocal teaching elements (question-generation, clarification, and prediction), as well as locating main ideas in text, to two groups: students assessed as being low-skilled and a comparison group of students assessed as college-ready upon entry to the institution. The low-skilled group showed significantly greater prepost gain than the comparison group on a standardized reading test, suggesting that the lower skilled readers benefited more than the competent readers from the reading strategy instruction. However, it was not entirely clear that the competent readers actually needed the strategy instruction.

Caverly et al. (2004) taught a self-regulation strategy called PLAN (Preplan, List, Activate, and Evaluate) to developmental reading students. Prior to learning the strategy, the students were taught task awareness, performance awareness, and self-awareness, and they were also taught to analyze the structure of text and remember what was read. The PLAN instruction included modeling and small-group practice. Significantly greater gain was reported for the strategy group compared to a nondevelopmental comparison group who had the same reading level at pretest, with a moderate effect size of d = 0.50, but it is difficult to interpret the results because the comparison group did not attend developmental education, and either the intervention or participation in developmental education in itself, or some combination, may explain the results.

Rochford (2003) offered a one-session writing test preparation workshop for English language learners addressing students' learning styles. The customization focused on the learning materials, which emphasized visual, auditory, and kinesthetic dimensions of learning, as well as the amount of structure individual students felt they needed. In comparison to a traditionally run workshop, the treatment group showed higher scores on the college writing assessment test, with more students scoring above the cut point for developmental education. This study was flawed in that there was no control for attention or novelty; the intervention involved many different kinds of materials while the comparison condition offered traditional preparation, which students may have found less interesting.

Embedding Developmental Reading and Writing Instruction in College-Level Course Work

Developmental education is not the only venue for reading and writing instruction for academically underprepared students. Several studies describe how support for literacy skills can be provided by discipline-area instructors (Artis, 2008; Brockman, et al., 2011; Fernsten & Reda, 2011; Grubb, et al., 1999; Juchniewicz, 2007; Lei, et al., 2010; Stewart, et al., 2010), and it has been recommended that schools of education preparing postsecondary teachers include literacy strategies for underprepared students (Morris & Price, 2008). As mentioned earlier, a policy shift is currently under discussion whereby, for all but the lowest skilled students, colleges could embed developmental skills instruction in college-level coursework, thus greatly reducing the number of stand-alone developmental courses.

The current literature review suggests three approaches to embedding developmental reading and writing instruction in college-level courses: (a) integration of explicit instruction in literacy strategies into college-level, content-area instruction in order to support the completion of assigned reading and writing tasks (Perin, 2011); (b) combining reading and writing instruction when embedding literacy instruction in disciplinary courses, especially because the two skills are deeply intertwined in the vast majority of college assignments, and students may have difficulty with writing tasks due to insufficient comprehension of source text (Brockman, et al., 2011); and (c) referring underprepared students in college-level courses to academic learning centers to receive tutoring in course-related reading and writing (Brittenham, et al., 2003; Gordon, 2008; Hock, et al., 1999; Hodges & White, 2001; Johnson, et al., 2009; Perin, 2004).

Discussion

The major finding of this review is that there is still much to be learned about the characteristics of the literacy skills of underprepared postsecondary students, and the effects of instructional techniques intended to promote improvement. The amount of literature on assessment and instruction (43 studies) identified for the review is small in relation to the size of the target population. Moreover, the studies focused on a wide range of skills and techniques, with little accumulation of evidence in any one area. Also, because of methodological flaws, only limited conclusions could be drawn on instructional effectiveness. This area is clearly ripe for an agenda of rigorous research. Admittedly, high attrition rates (Bailey et al., 2010) make the target population difficult to study. But with appropriate sample size, design, and statistical techniques, this problem is not insurmountable.

The literacy difficulties of underprepared postsecondary students appear similar to those of low-achieving students in secondary and adult literacy education (Brasseur-Hock, Hock, Kieffer, Biancarosa, & Deshler, 2011; De La Paz & Felton, 2010; Mellard, Fall, & Woods, 2010), although this possibility needs to be verified in future research. Further, no models are currently available of how the various reading and writing components fit together among underprepared postsecondary students, as there are for K-12 and adult literacy samples (Berninger, Abbott, Abbott, Graham, & Richards, 2002; MacArthur, Greenberg, Mellard, & Sabatini, 2010; Vellutino, Tunmer, Jaccard, & Chen, 2007). Models of the reading of adult literacy students show different patterns from those found for K-12 students (Mellard, et al., 2010; Nanda, Greenberg, & Morris, 2010), suggesting different trajectories in literacy acquisition. Determining the extent to which models of underprepared postsecondary students' reading and writing are similar to those for each of the other two populations would have important implications for instructional planning. Instruction for the three populations centers on college and career readiness (for one view of the literacy skills needed, see National Governors' Association & Council of Chief State School Officers, 2010), and knowledge of similarities and differences in skills would suggest whether interventions developed in K-12 and adult literacy settings would be applicable to underprepared college students.

The skills addressed in the assessment studies were consistent with one aspect or another of currently supported models of the reading and writing process (e.g., Hayes, 1996; Perfetti, Landi, & Oakhill, 2005), but the studies rarely referred to such work. The assessment information on academically underprepared college students was sketchy; some functions addressed in current theory (such as decoding and fluency in reading, as well as processes underlying planning, drafting, and revision in writing), were underrepresented in the assessment literature, although there is some new research on writing processes (MacArthur & Philippakos, 2013). There was a tendency in the studies towards applied measures focusing on performance levels rather measures reflecting theoretical constructs of reading and writing.

More information is needed about the reading and writing skills of higher versus lower achievers, and native versus nonnative English speakers, especially in light of suggestions that these groups may not differ on several literacy skills (Becket, 2005; Kelly et al., 2001). Additionally, given current demographic patterns in the United States, it will be important to delineate further the reading and writing patterns of Generation 1.5 learners, native speakers of English, and English-language learners, following on Doolan and Miller (2012). Also, the predictiveness of affective variables for literacy performance needs further investigation in order to resolve possibly contradictory evidence identified in the current review (Jones, 2008; Randall, 2008). Understanding this relation is important, as MacArthur and Philippakos (2013) found that developmental education students who received explicit instruction in writing strategies showed increases in motivation and self-efficacy.

Overlooked entirely in the research literature are studies of the ability of underprepared postsecondary students to integrate reading comprehension and writing skills in the types of holistic literacy practice that signify college readiness, such as the ability to conduct research (Conley, 2008). Given the interest in combining reading and writing in single courses rather than teaching the two areas separately (Edgecombe, 2011; Railey, Hern, & Shannon, 2011), this is an important area for future research.

It was notable that, although developmental education has been criticized for an overemphasis on discrete skills (Grubb, et al., 1999), only one study of instructional effectiveness (Martino, et al., 2001) focused on this approach. A national survey of instructional approaches used in developmental classrooms, similar to surveys in K-12 education (e.g., Kiuhara, Graham, & Hawken, 2009), would be a useful source of information for the field. The studies of instructional effectiveness identified in the present review appeared to represent only a smattering of techniques currently in use. Once the most prevalent instructional approaches are identified, it would be useful not only to test their effectiveness but to learn whether the same or different techniques are being used in college compared to secondary and adult literacy programs.

In summary, the field would benefit from future research to (a) identify similarities and differences in the literacy skills of underprepared postsecondary students compared to secondary and adult literacy students; (b) hypothesize theoretically grounded explanations of the reading and writing difficulties of underprepared post-secondary students; (c) rigorously compare the reading and writing skills of higher and lower achievers, as well as English language learners, Generation 1.5 students, and native-English speakers; (d) determine the extent to which motivation, self-efficacy and other affective variables are related to reading and writing performance; (e) investigate students' ability to integrate reading and writing skills in authentic academic tasks; (f) identify the most frequently used approaches to developmental reading and writing instruction; (g) test the effectiveness of the most frequently used instructional approaches; and (h) compare outcomes for different methods of embedding reading and writing instruction in college-level course work.

Conclusion

Given the size of the population and the level of need, the reading and writing of underprepared students in higher education is currently an underresearched area. Assessment studies identifying patterns of strength and weakness in reading and writing are not systematically related to current reading and writing theory. The body of studies of the effectiveness of reading and writing instruction for underprepared college students is small and undermined by methodological flaws. As with the assessment research, the studies on instructional effectiveness, and those that describe instruction but do not present outcome data, have a tenuous connection to the literacy research conducted with other populations and are not well grounded in comprehensive theories of reading and writing processes. However, the expertise and practical insights of developmental education instructors, captured in many of the studies identified in this review, will be an important resource in developing and implementing a rigorous research agenda aimed at improving reading and writing outcomes for academically underprepared students in postsecondary education.

Appendix

Summary of Studies Reviewed (n = 43).

References, by type of study	Framework[a]	Setting	Constructs assessed[b] or instructional focus[c]
Assessment studies			
Becket (2005)	n/a	Developmental writing	Perception of self as reader/writer; quality of oral and written language
Doolan & Miller (2012)	n/a	Developmental writing	Writing quality, error rate, error type
Dunning (2009)	n/a	Developmental history	Self-perceived ability to speak and write Standard English, motivation
Jones (2008)	n/a	Developmental English	English grade, writing score, locus of control, self-efficacy, academic goals and behaviors
Kelly et al. (2001)	n/a	Developmental English	Reading comprehension and metacognition

(continued)

TABLE: Appendix: Summary of Studies Reviewed (n = 43).

References, by type of study Framework[a] Setting Constructs assessed[b] or instructional focus[c] Assessment studies Becket (2005) n/a Developmental writing Perception of self as reader/writer; quality of oral and written language Doolan & Miller (2012) n/a Developmental writing Writing quality, error rate, error type Dunning (2009) n/a Developmental history Self-perceived ability to speak and write Standard English, motivation Jones (2008) n/a Developmental English English grade, writing score, locus of control, self-efficacy, academic goals and behaviors

Appendix (continued)

References, by type of study	Framework[a]	Setting	Constructs assessed[b] or instructional focus[c]
Laverpool (2008)	n/a	Developmental reading	Reading comprehension
Martino & Hoffman (2002)	n/a	Speech communication	Decoding and reading comprehension
McCabe et al. (2006)	n/a	Academic support	Reading comprehension, self-efficacy
Perin et al. (2003)	n/a	Developmental reading	Reading comprehension, writing quality, prior knowledge
Randall (2008)	n/a	Developmental reading	Self-efficacy, values, self-regulation, achievement, persistence
Scordaras (2009)	n/a	ESL or Developmental English	Writing quality
Shelton (2006)	n/a	Developmental reading	Self-reported reading strategies
Van Blerkom & Van Blerkom (2004)	n/a	Study strategies	Self-reported reading strategies
Wang (2009)	n/a	College reading	Reading comprehension
Effectiveness studies			
Caverly et al. (2004)	SD	Developmental reading	Reading comprehension strategy
Friend (2001)	SD	Prefreshman writing	Written summarization strategies
Hamilton (2007)	MM	Developmental reading	Reading comprehension, vocabulary, test-taking
Hart & Speece (1998)	SD	Developmental reading	Reciprocal teaching or cooperative learning
Martino et al. (2001)	DS	Biology	Tutoring in reading or help with biology
Moore (2000)	LC	See column to the right	Developmental reading, developmental writing, orientation, content course clustered
Perin et al. (2012)	MM	Developmental reading and writing	Contextualized reading and writing skills
Rochford (2003)	MM	ESL	Writing test preparation workshop
Snyder (2002)	SD	Developmental reading	Reading comprehension strategy
Visher et al. (2012)	LC	See column to the right	Developmental or college English, developmental reading, content course, and orientation course clustered (several colleges, varied clusters)
Wein et al. (2010)	LC	See column to the right	Developmental reading and college success course paired
Weissman et al. (2012)	LC	See column to the right	Developmental English paired with college content or success course
Willingham (2009)	MM	Developmental reading	Vocabulary instruction
Descriptive studies			
Artis (2008)	SD	Marketing	SQ3R: Survey, Question, Read, Recite, Review to read content textbooks

(continued)

TABLE: Appendix: (continued).

References, by type of study Framework[a] Setting Constructs assessed[b] or instructional focus[c] Kelly et al. (2001) n/a Developmental English Reading comprehension and metacognition References, by type of study Framework[a] Setting Constructs assessed[b] or instructional focus[c] Laverpool (2008) n/a Developmental reading Reading comprehension Martino & Hoffman (2002) n/a Speech communication Decoding and reading comprehension McCabe et al. (2006) n/a Academic support Reading comprehension, self-efficacy Perin et al. (2003) n/a Developmental reading Reading comprehension, writing quality, prior knowledge Randall (2008) n/a Developmental reading Self-efficacy, values, self-regulation, achievement, persistence Scordaras (2009) n/a ESL or Developmental English Writing quality Shelton (2006) n/a Developmental reading Self-reported reading strategies Van Blerkom & Van Blerkom (2004) n/a Study strategies Self-reported reading strategies Wang (2009) Effectiveness studies n/a College reading Reading comprehension Caverly et al. (2004) SD Developmental reading Reading comprehension strategy Friend (2001) SD Prefreshman writing Written summarization strategies Hamilton (2007) MM Developmental reading Reading comprehension, vocabulary, test-taking Hart & Speece (1998) SD Developmental reading Reciprocal teaching or cooperative learning Martino et al. (2001) DS Biology Tutoring in reading or help with biology Moore (2000) LC See column to the right Developmental reading, developmental writing, orientation, content course clustered Perin et al. (2012) MM Developmental reading and writing Contextualized reading and writing skills Rochford (2003) MM ESL Writing test preparation workshop Snyder (2002) SD Developmental reading Reading comprehension strategy Visher et al. (2012) LC See column to the right Developmental or college English, developmental reading,

content course, and orientation course clustered (several colleges, varied clusters) Weis et al. (2010) LC See column to the right Developmental reading and college success course paired Weissman et al. (2012) LC See column to the right Developmental English paired with college content or success course Willingham (2009) MM Developmental reading Vocabulary instruction

Appendix (continued)

References, by type of study	Framework[a]	Setting	Constructs assessed[b] or instructional focus[c]
Baker, Hope, & Karandjeff (2009)	MM, LC	Developmental and credit English	Contextualized reading and writing instruction in paired courses
Boroch et al. (2007)	MM, SD, CS	Developmental English	Reading apprenticeship: reading comprehension, metacognition
Bosher (1992)	MM	Orientation program	Write personal narrative based on cultural knowledge, and bridge to academic writing
Burgess (2009)	MM	Developmental reading	Reading comprehension through online discussion and chat boards
Butler, Elaschuk, & Poole (2000)	SD, MM	Career-technical education	Individualized tutoring in reading and writing using course assignments
Fullmer (2012)	DS	English and education students	Online tutoring in reading comprehension, vocabulary and writing
Goldschmidt, Notzold, & Miller (2003)	DS	College orientation	Instruction and peer tutoring in grammar and writing as part of larger orientation
Good (2000)	MM	Developmental reading	Study skills, reading and writing for academic courses, reader response framework
Goode (2000)	MM	Developmental reading and writing	Integrated reading and writing, meaningful text, workshop model
Kaspar (1996)	MM, DS	ESL	Reading comprehension, writing personal narratives and academic essays
MacArthur & Philippakos (2013)	SD	Developmental writing	Explicit instruction in self-regulated writing strategy
Mongillo & Wilder (2012)	MM	Developmental reading	Online, game-like practice in reading and writing expository text, with peer feedback
Reynolds & Bruch (2002)	MM, CS	Developmental writing	Writing for authentic purposes, reflection logs
Tai & Rochford (2007)	LC	See column to the right	ESL, developmental reading and developmental writing clustered
Weiner (2002)	CS	Developmental reading, migrant program	Cultural, ideological, political and pedagogical dimensions of literacy practice

Note. n/a = not applicable. ESL = English as a Second Language; DS = discrete skills; MM = meaning making; SD = strategy development; CS = critical sociocultural; LC = learning community.
[a]Applies to effectiveness and descriptive studies.
[b]Applies to assessment studies.
[c]Applies to effectiveness and descriptive studies.

TABLE: Appendix: (continued).

References, by type of study Framework[a] Setting Constructs assessed[b] or instructional focus[c] Descriptive studies Artis (2008) SD Marketing SQ3R: Survey, Question, Read, Recite, Review to read content textbooks References, by type of study Framework[3] Setting Constructs assessed[b] or instructional focus[c] Baker, Hope, & Karandjeff (2009) MM, LC Developmental and credit English Contextualized reading and writing instruction in paired courses Boroch et al. (2007) MM, SD, CS Developmental English Reading apprenticeship: reading comprehension, metacognition Bosher (1992) MM Orientation program Write personal narrative based on cultural knowledge, and bridge to academic writing Burgess (2009) MM Developmental reading Reading comprehension through online discussion and chat boards Butler, Elaschuk, & Poole (2000) SD, MM Career-technical education Individualized tutoring in reading and writing using course assignments Fullmer (2012) DS English and education students Online tutoring in reading comprehension, vocabulary and writing Goldschmidt, Notzold, & Miller (2003) DS College orientation Instruction and peer tutoring in grammar and writing as part of larger orientation Good (2000) MM Developmental reading Study skills, reading and writing for academic courses, reader response framework Goode (2000) MM Developmental reading and writing Integrated reading and writing, meaningful text, workshop model Kaspar (1996) MM, DS ESL Reading comprehension, writing personal narratives and academic essays MacArthur & Philippakos (2013) SD Developmental writing Explicit instruction in self-regulated writing strategy Mongillo & Wilder (2012) MM Developmental reading Online,

game-like practice in reading and writing expository text, with peer feedback Reynolds & Bruch (2002) MM, CS Developmental writing Writing for authentic purposes, reflection logs Tai & Rochford (2007) LC See column to the right ESL, developmental reading and developmental writing clustered Weiner (2002) CS Developmental reading, migrant program Cultural, ideological, political and pedagogical dimensions of literacy practice

Note. n/a = not applicable. ESL = English as a Second Language; DS = discrete skills; MM = meaning making; SD = strategy development; CS = critical sociocultural; LC = learning community.

[a]Applies to effectiveness and descriptive studies.

[b]Applies to assessment studies.

[c]Applies to effectiveness and descriptive studies.

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