

Academic Vocabulary: A Developmental Reading Research Agenda

By Michelle Andersen Francis and Sonya L. Armstrong

ABSTRACT: *The face of developmental reading is changing. Yet, the mission does not change: Students must be prepared to tackle academic texts if they are to be successful in college, and this is the essence of academic literacy instruction. Developmental reading professionals must have a deep understanding of academic vocabulary acquisition. Unfortunately, there has been a dearth of current research on academic vocabulary in the field. By looking to related research beyond the field, though, professionals in the field can think about how to shape future research to help find answers specific to college students. This manuscript aims to do just that by offering a brief critical literature review on academic vocabulary across educational levels and contexts in order to highlight what might be modified and/or reexamined for the college level.*

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Vocabulary research has had a long history, beginning with Dale (1965) who was one of the first to ponder what it means to know a word. This continued in the 1970s and 1980s when researchers investigated various avenues of the vocabulary acquisition and learning processes (e.g., Anderson & Freebody, 1981; Graves, 1987). This research has crossed educational levels and contexts but has strong ties to literacy at the college level (e.g., Francis, 2002; Francis, 2006; Francis & Simpson, 2018; Nist & Olejnik, 1995; Nist & Simpson, 1993; Nist & Simpson, 2000a; Stahl, Brozo, & Simpson, 1987; Stahl, Brozo, Smith, Henk, & Commander, 1991; Willingham & Price, 2009). As the 21st century approached, the shift in literacy research turned to critical reading and other more pressing issues of the day, particularly at the college level. However, almost 20 years into the new century, vocabulary again calls developmental reading professionals to the research docket, as the role of academic reading is redefined for new college pathways. It is, at this juncture, critical that the field undertake research into how vocabulary instruction at the college level is most effectively undertaken.

The Changing Face of Developmental Reading

There have been recent indications in the literature warning that the face of the developmental reading field is changing (i.e., merging of developmental reading and writing courses, elimination of developmental reading departments, state and local

initiatives aimed at streamlining student pathways) (e.g., Armstrong & Stahl, 2018; Juncos & Collins, 2015). However, the mission of developmental reading does not change: Students must be ready to tackle academic texts and critical thinking if they are to be successful in college, and this is the essence of academic literacy. Indeed, developmental reading professionals know and intimately understand that the demands of academic literacy go beyond just the reading of a textbook; they also involve vast amounts of discipline-specific and general vocabulary acquisition and learning. If students are to be successful in postsecondary contexts, reading professionals must have a deep understanding of how students acquire vocabulary, why that acquisition is important, and how to support students in the vocabulary acquisition and learning task. Thus, a renewed scholarly focus within the field, including an updating of some of the most critical and presently underrepresented inquiry topics (including academic vocabulary), is now appropriate.

Unfortunately, there has been a dearth of research in the last several decades on this topic in the developmental reading field. However, the field can look to research on the topic that focuses on learners in other educational contexts and think about how to shape future research to help find answers specific to college students. Thus, the purpose of this manuscript is to offer a brief critical literature review of existing scholarship on academic vocabulary across educational levels and contexts (including past research on college learners) in order to highlight what might be modified and/or reexamined for the college level. Throughout, we provide syntheses across multiple topics associated with academic vocabulary; at the conclusion of each section, we offer possible research queries drawn from the existing scholarship but specific to the college level. The aim is to provide insights in one area within a larger research agenda for college and developmental reading scholars.

In the sections that follow, we offer a definition of academic vocabulary and then provide discussions of three key areas of inquiry related to vocabulary instruction at the college level: (a) the intersections of academic vocabulary and achievement, (b) vocabulary-acquisition strategies, and (c) vocabulary instruction generally. We summarize briefly some of the extant research specific to each inquiry area. At the

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end of each section, we also make recommendations about possible extensions, replications, or updates to that research in the form of potential research questions for future investigation.

Academic Vocabulary

At its heart, academic vocabulary is the vocabulary that students are required to know if they are to perform well in the disciplines, such as science and history. This can be separated into two distinct categories, *general academic vocabulary* and *discipline-specific vocabulary* (Baumann & Graves, 2010). General academic vocabulary consists of the words that may have multiple definitions that are similar but used differently in each discipline. An example might be the word “acute.” It can be defined as both an angle in a math context, as well as a type of condition in a biology context. Students must, of course, be able to understand the meaning in each context. Discipline-specific vocabulary consists of words that apply to only one discipline. An example might be “phlebotomy.” Nursing students need to understand the meaning of this word, but it might not have much relevance for a music major. Developmental reading instructors may not be as concerned with direct instruction of discipline-specific vocabulary, choosing instead to focus on general academic vocabulary. However, teaching students how to learn vocabulary across multiple contexts, both general and discipline-specific, is important for all types of academic vocabulary.

General Academic Vocabulary

The idea that students need to learn a set of general academic vocabulary in order to be successful is well established (e.g., McKeown, Crosson, Artz, Sandora, & Becket, 2013; Neal, 2015; Townsend, Bear, Templeton, & Burton, 2016). These general academic vocabulary words are at the heart of academic literacy, with an acknowledgment that students need to have a grasp on certain words if they are to successfully engage with academic texts. In an effort to identify the types of words that college students might need to accurately learn from academic texts, Coxhead (2000) used a corpus of 414 texts to develop the Academic Word List (AWL). The AWL contains words that students are most likely to commonly encounter when reading a wide variety of academic texts, so they are necessary to learn. Although the AWL is useful for identifying general academic vocabulary, Coxhead acknowledged that direct instruction and students’ usage of the words are imperative to learning the identified words. Therefore, it is up to the instructor to examine the AWL and teach those words to students using best practices in vocabulary instruction. For example, research has shown that giving students practice with the words orally and in written form can help students retain the words (Francis & Simpson, 2003).

Discipline-Specific Vocabulary

The concern about whether or not students can use academic language is not limited to the reading field. For example, Snow (2010) expressed concern over the inability of middle and high school students to comprehend science textbooks because of the discipline-specific academic language. Snow asserted that academic language is concise language with a high density of information-bearing words that involve grammatical processing and an impersonal authoritative voice. She further explained that science teachers can help students’ ability to discuss ideas in science by focusing on science-specific vocabulary as well as general academic vocabulary.

In addition, one dissertation study focused on students’ beliefs about vocabulary in a biology class. In this mixed methods study, Francis (2006) measured students’ beliefs about vocabulary and then interviewed several students about their beliefs in relation to their learning in the biology course.

Facilitators shared research-based curriculum decisions and project-based assignment examples to prepare instructors for full implementation of the new curriculum.

Her results indicated that students were aware of vocabulary acquisition strategies as taught by the instructor. One student in particular noted that his lack of vocabulary prowess was responsible for his inability to grasp the course content. The researcher found, however, that this awareness was heightened when the instructor used morphemic analysis (a strategy for examining word parts to try to determine the word meaning) to teach biology words and when she explained how she, as a biologist, learned new words.

Research queries. Based on what is already known about both general academic and discipline-specific vocabulary, some avenues for future research emerge that are specific to the postsecondary level:

1. What impact does instruction with general academic word lists (e.g., Coxhead, 2000; Dale & O’Rourke, 1981) have on discipline-specific vocabulary learning?
2. What general academic vocabulary-acquisition strategies are most effective for beginning college learners?

3. What are the relationships between general academic vocabulary acquisition and reading comprehension across the academic disciplines?
4. What discipline-specific vocabulary-acquisition strategies are most effective for beginning college learners?
5. How aware are college students of their own general academic vocabulary knowledge and/or discipline-specific vocabulary knowledge?
6. What might college students be willing to do, either independently or with help, to enhance their academic vocabulary skills?

Even though there is a great deal of scholarship available on the differences between general academic and discipline-specific vocabulary, much is yet to be learned about how students best acquire such specialized vocabulary at the postsecondary level.

Academic Vocabulary and Achievement

Specific to the postsecondary level, not much research exists that examines the relationship between academic vocabulary (both general and discipline-specific) and college students’ overall academic achievement. However, there are studies at other educational levels that might inform future research endeavors seeking to investigate the relationship between students’ knowledge of academic vocabulary and their academic achievement. In one study related to students’ knowledge of academic vocabulary at the postsecondary level, DeMarie, Alois-Young, Prideaux, Muransky-Doran, & Gerda (2004) examined college students’ recall of words in their discipline. The authors found that students’ familiarity with words was related to the number of classes they had taken in their major. This is not earth-shattering information, but an interesting finding by the researchers was that students in the middle of their degree programs did not experience increased word knowledge; instead they reached a plateau. This could be, as DeMarie et al. suggest, due to the students’ engagement in deep processing of the words and the relationships those words have to one another.

Research at the secondary education level has also identified the relationship between academic achievement and academic vocabulary. A review of the literature on academic vocabulary as it relates to struggling readers in the secondary level has identified that students are at a disadvantage when they do not have a grasp on the discipline-specific vocabulary necessary to perform in that discipline (Harmon, Hedrick, & Wood, 2005). For example, when doing a mathematics problem, if students

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do not understand what a trapezoid is, they will be unable to answer the question. Snow (2010) has further emphasized the need for students to learn discipline-specific vocabulary if they are to perform well with the science curriculum.

Another one of the few existing college-level studies on this topic was a dissertation study. Craigo (2015) researched the impact of teaching and modeling vocabulary acquisition strategies on community college students' reading of content-area texts. Students in the experimental groups were taught vocabulary acquisition strategies, direct definitions, and a mixture of the two. Her results indicated that vocabulary strategy instruction was important, but that students struggled with transfer of those skills beyond the specific passages in the teaching intervention. Vocabulary strategy instruction can take a cue here from learning and study strategy instruction research: Transfer of these skills may take more time than 1 semester (or any other arbitrary time constraint imposed by academic terms); (Cross, 1979; Goldstone & Day, 2012; Mikulecky, Albers, & Peers, 1994; Perkins & Salomon, 1989; Salomon & Perkins, 1989). This, of course, supports the notion that academic vocabulary strategies would be best taught as embedded strategies within multiple academic discipline courses.

Research queries. Based on what is already known about the relationship between vocabulary acquisition and academic achievement, some avenues for future research emerge that are specific to the postsecondary level:

1. What are the relationships between academic vocabulary learning and overall academic achievement at the postsecondary level?
2. At what point do college learners reach a plateau of word knowledge?
3. What are the most effective approaches for encouraging transfer of word knowledge across academic contexts?

This is, of course, only a partial list, as the intersectional possibilities between vocabulary and achievement are really limitless at this point, especially given how little is known about this area as reported in the extant research.

Academic Vocabulary-Acquisition Strategies

Students must acquire numerous new words if they are to be successful in the postsecondary realm, but there are many ways to acquire those words. For example, students learn words through wide reading (Stahl, Simpson, & Hayes, 1992), context clues, dictionary use, and explicit instruction. Wide reading can be problematic because students report that they

do not read, and dictionaries can be challenging to use (Nist & Olenjik, 1995). Although learning words from context is important to increasing the number of words students learn each year (Nagy & Herman, 1987), explicit instruction is necessary to supplement the learning from context alone (Francis & Simpson, 2003). The explicit instruction of a list of words is, at its core, an *additive vocabulary strategy*.

Additive vocabulary strategies are those that add words to a student's vocabulary through teaching a list of prescribed words. For example, giving students a list of words to study and then giving them an assessment on those words is an additive strategy. The other type of vocabulary strategies are *generative vocabulary strategies*, or those that teach students the skills necessary to generate their own vocabulary learning through metacognitive and strategic methods. So, although explicit instruction is an additive strategy because students are adding a set list of new words to their vocabulary, if reading educators provide explicit instruction on direct acquisition of

Developmental reading instructors can also take cues from their discipline-specific colleagues regarding what words are important and why.

words from text, it creates a foundation of generative strategies.

Additive and Generative Strategies

There is no specific 'set' of words that is necessary to succeed in college (although such lists have been attempted; see, for example, Coxhead, 2000; Dale & O'Rourke, 1981). Rather, research has shown that what students need is to become proficient as consumers and users of language (Francis & Simpson, 2003; Nagy & Townsend, 2012). In short, this entails demonstrating to students how words and language function both in oral and written format in order to empower students to generate their own meanings in unfamiliar Discourse situations (see Gee, 1996, for a discussion of big-D and little-d discourses). Neal (2015) has further emphasized this approach when discussing the notion that developmental reading instructors can work with discipline-specific texts as a means of teaching students how language changes with each different context. Developmental reading instructors can also take cues from their discipline-specific colleagues regarding what words are important and why. For example, a history professor who discusses how

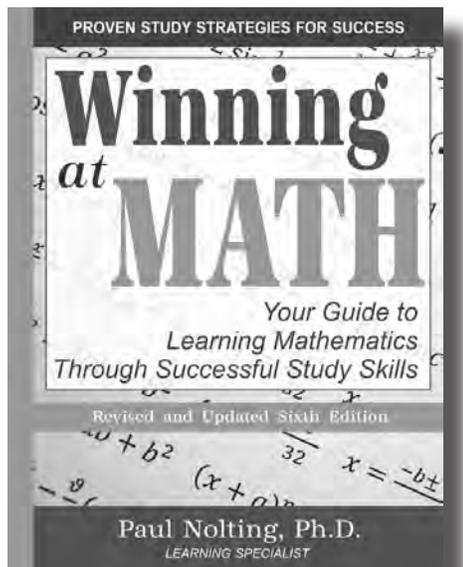
the word "communism" has changed over time is demonstrating to students that part of learning history vocabulary is understanding all the shades of meaning of a word. This explicit instruction of words and how to acquire them engages both learners and teachers in language-learning.

Morphological Knowledge Strategies

Academic vocabulary also requires students to utilize morphological knowledge as a means of decoding and understanding unfamiliar words. Morphological knowledge is grasping the definition of root words, deciphering how prefixes and suffixes change words, and using that information to ultimately increase the number of academic vocabulary words at students' disposal. In a related study of 7th and 8th grade students of diverse backgrounds, Townsend et al. (2016) used spelling tasks to investigate the relationship between knowledge of academic words and academic achievement in the disciplines. They administered three, word-knowledge measures and two standardized tests. The results supported the notion that morphological knowledge is a tool that can help students when they are encountering increasingly complex academic texts. Therefore, educators in the disciplines can teach morphological strategies as a generative vocabulary acquisition strategy, especially in courses such as nursing, where understanding roots and prefixes can be a distinct advantage. Further, the Townsend et al. study offers initial buoyancy to the idea that morphological awareness significantly predicts academic achievement. Admittedly, this study was done with middle grade students, but it could be replicated with college students and possibly modified so that students' morphological awareness could be measured and connected with course grades or understanding of course content.

In fact, there are several recent research studies that have delved into the relationship between morphological awareness and vocabulary knowledge. Pacheco and Goodwin (2013) have investigated middle school students' use of morphological strategies as a means of informing instruction. Their results show that students were able to use their knowledge of morphemes to understand complex words while reading academic texts, lending credence to the need for teachers to embed morphological strategy instruction into their vocabulary lessons. In Bowers and Kirby's (2010) study, an experimental group of 4th and 5th graders received instruction on morphological and orthographic techniques while the control group did their usual lessons. The results indicate that students were able to use morphology to uncover word meanings, but only with words from the morphological families they were taught. Again, given that the students were younger, there is a need for study replication at the postsecondary level. Mountain (2015) has taught preservice teachers about morphemic techniques so that they might take

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that knowledge into their own discipline-specific classrooms. Her findings showed that morphemes are highly discipline specific and therefore teachers in all disciplines should discuss morphemic analysis as part of the academic vocabulary discussion. Interesting studies could be done to extend this idea, perhaps around analysis of current academic vocabulary practices or as an investigation of how students currently use morphemic analysis in their own studying.

The younger grade research is demonstrating a connection between morphemic analysis instruction and academic vocabulary acquisition that could then be replicated at the college level. For example, Flanigan, Templeton, & Hayes (2012) cited using morphological knowledge to foster generative vocabulary learning, or learning that generates new word acquisition for students. This notion is key for college students because learning word families did help the younger students decode the words in the disciplines (Bowers & Kirby, 2010), so there is no reason to believe that the story is different for college students. Further, Bear and Templeton (1998) point to the connection between younger students' spelling and word acquisition, such that students who learn how new words relate to already known words (i.e., "mar" means ocean, so words like "marina" and "mariner" relate to the sea) are more likely to have richer word meaning connections. Additionally, morphemic analysis might well be an equity issue. Townsend et al. (2016) have found some discrepancy

in performance between English Language Learners and students from low socio-economic backgrounds. If learning morphemic analysis as an academic vocabulary strategy can be proven to increase all college students' chances of success in the content areas, instructors can even the playing field.

Research queries. Based on what is already known about vocabulary-acquisition strategies across the educational levels, some avenues for future research emerge that are specific to the postsecondary level:

1. How do discipline-specific instructors use additive strategies in their classrooms? With this knowledge in hand, how can developmental reading professionals model those same types of instructional strategies in their own classrooms?
2. What is the cognitive process that college students engage in when they try to acquire new academic vocabulary? How can developmental reading professionals take this knowledge and then help students hone that skill?
3. What is the role of morphological knowledge, and use of that knowledge, on academic vocabulary acquisition?
4. If morphological knowledge does play an important role in college students' academic vocabulary acquisition,

how does that impact their academic performance in the disciplines?

5. Drawing upon extant research, what are the connections between vocabulary-development strategies and sociocultural, linguistic, or economic factors?

Although much is already known about these issues at other educational levels, there are many opportunities to extend the research on vocabulary-acquisition into the postsecondary realm, paying specific attention to the academic disciplines.

Vocabulary Instruction and Practice

We recognize that research informs practice, and we do bring a practitioner lens to our present synthesis, as well as our suggestions toward a research agenda. Thus, here we provide two instruction-focused avenues of query specific to the college level.

Effective Approaches for Teaching Vocabulary

In the postsecondary realm, there has traditionally been extensive focus on the instructional side of vocabulary (e.g., Francis & Simpson, 2018; Neal, 2015; Nist & Simpson, 2000b). However, this has focused on how developmental reading professionals should teach vocabulary. Instead, we posit that a shift in the focus might allow developmental reading

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professionals to glean additional information from sources such as discipline teachers and textbooks that might then inform the teaching of academic vocabulary.

First, examining how textbooks and teachers within the disciplines (specifically the first-year general education fields) teach academic vocabulary could go a long way toward helping students understand the demands of reading in that field. For example, economics instructors who focus on economics vocabulary could discuss how they, as the discipline experts, learn the requisite and appropriate vocabulary (see Shanahan, Shanahan, & Misischia, 2011 for a similar expert-reader study). This insight into how experts in the discipline learn vocabulary might lead to increased learning for students.

Also, it is clear from Francis's (2006) preliminary study, that students pay attention to the discipline instructors when they talk about how they themselves learn material. Further research into this idea might prove that students do attend to learning strategies offered by the instructor. This could then indicate to discipline instructors that they should continue to model and provide examples of how they learn, both academic vocabulary and other ideas in the discipline.

Alternative Methods for Teaching Vocabulary

More research needs to be done to investigate the most effective methods to teach academic vocabulary. There is a plethora of research into how to teach vocabulary in general, but it might be that changes in the reading field necessitate rethinking how and when vocabulary instruction gets prioritized. That is, if stand-alone developmental reading classes are no longer the norm, there might be alternative methods to teach the academic vocabulary acquisition strategies necessary for student success. For example, it might behoove professionals in the field to encourage discipline faculty to teach academic vocabulary. In order to standardize this, research must be done on best vocabulary acquisition practices in each discipline or on the most effective strategies for students wanting to acquire any academic vocabulary.

Another idea is to think about developing a research-backed, one-credit vocabulary acquisition strategy course. The course could be part of students' initial semester in college or it could be connected to a discipline course (i.e., Vocabulary for Nursing, Learning Words in Mathematics). The rationale for such a stand-alone, one-credit course would lie in the connection between academic vocabulary and achievement, which is why research into this area, as mentioned earlier in the article, is imminently important. Another notion is to develop a noncredit course offering for students who want to develop

their vocabulary knowledge and acquisition skills without having to pay for the course or have the course show up on official transcripts. As states continue to move toward eliminating or reducing developmental reading coursework, such models would be opportunities for developmental reading instructors to craft discipline-specific student success initiatives (Stahl & Armstrong, 2018). These initiatives would allow developmental reading instructors to utilize their extensive knowledge about learning and success in novel ways (e.g., through corequisite, stand-alone vocabulary, or noncredit courses). Researching effective practice and the outcomes of such course offerings would thereby justify investment of college funds and student time.

Research queries. Based on what is already known about vocabulary instruction, some avenues for future research emerge that are specific to the postsecondary level:

1. How do discipline-specific experts acquire academic vocabulary? How do they

Such models would be opportunities for developmental reading instructors to craft discipline-specific student success initiatives.

articulate that learning to students?

2. What can students learn from discipline-specific experts that might help them as future learners in that discipline?
3. How can developmental reading professionals take what is known about vocabulary knowledge and acquisition and offer guidance to discipline colleagues so that they may more effectively teach academic vocabulary acquisition strategies to their students?
4. What role can developmental reading professionals play in a new model of academic vocabulary support (e.g., support classes, instructional training for other faculty, and/or corequisite courses)?
5. What types of supports (formal course supports or more informal types such as tutoring or workshops) are most effective in supporting students' vocabulary development in the absence of a focused developmental reading course?

The present reality is that developmental reading is changing, with or without an evidence base to

demonstrate the impact that such changes will have on students. It is therefore imperative that developmental reading professionals undertake research to better understand the efficacy and impact of such new designs and structures while still considering how to further the evidence base for teaching academic vocabulary.

Conclusion

Developmental reading is a field of traditions, but those traditions are being both redirected and revised, for better or for worse (Stahl & Armstrong, 2018). Developmental reading professionals must be involved in the shaping of a focused research agenda for the new paradigm of college developmental reading. This new research agenda can involve a renewed examination of vocabulary research, with the lens toward academic vocabulary knowledge and acquisition. If developmental reading professionals take a hint from their elementary- and secondary-level counterparts, they can design cutting-edge research by investigating how college students acquire academic vocabulary and how instructors can support and encourage that acquisition. Ultimately, all instructors want students to successfully learn the content of a discipline, and academic vocabulary is a large part of that content.

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