CHAPTER THREE

Student Engagement

John Almarode

"To teach is to engage students in learning; thus teaching consists of getting students involved in the active construction of knowledge. A teacher requires not only knowledge of subject matter but also knowledge of how students learn and how to transform them into active learners. Good teaching, then, requires a commitment to systematic understanding of learning . . . The aim of teaching is not only to transmit information, but also to transform students from passive recipients of other people's knowledge into active constructors of their own and others' knowledge."

SMITH, 2000, p. 25

THE PROBLEM

According to a report released by the National Center for Education Statistics (2012), approximately 8,300 students drop out of America's high schools per school day. This number translates into approximately one student every 11 seconds making the decision to

walk away from our classrooms to pursue what they feel are more appealing opportunities, despite the fact that data suggest there are expensive consequences to this decision: students who drop out are more likely to be unemployed, live in poverty, experience ill health, be incarcerated, and seek support from social services. (Alliance for Excellent Education, 2009; Balfanz and Neild, 2007; Allensworth and Easton, 2005). Financially, America's estimated total economic loss over the lifetime of each dropout class is 90 billion dollars (Levin, Belfield, Muennig, and Rouse, 2007; Rouse, 2005). These troubling statistics beg the question: why are so many of America's students choosing options other than earning a high school diploma each year in the United States? Put differently, why would someone take their chances with unemployment, poverty, ill health, incarceration, and social programs instead of staying in school and earning a high school diploma? Are America's classrooms that unwelcoming?

Researchers have long sought a solution to America's dropout problem, and in many cases, schools seek a magic bullet, or the be-all-and-end-all solution to preventing students from exiting our classrooms without earning their diplomas (e.g., Academy of Creative Education, Admission Possible, and CASASTART (Striving Together to Achieve Rewarding Tomorrows)). A perfect solution has yet to be identified for all of America's students who are at risk for dropping out. However, researchers have identified variables or factors that are correlated with the students dropping out of school, such as minority status, poverty, and low test scores (Gleason and Dynarski, 2002). What is interesting about many of these variables or factors correlated with students dropping out of school is that these variables are not predictive of whether students will actually drop out (Rumberger, 2004). This makes sense and may not be sur-

prising to many district leaders, building administrators and teachers. For example, many schools and school systems have a majority of students that share these characteristics and have graduation rates that exceed the national average. A student being classified as an ethnic minority, poor, or not performing well on tests does not mean that the student will make the decision to not graduate from high school.

What characteristics or factors do serve as predictors of students dropping out of school and ultimately answer the question, why do students drop out of school? A growing body of research is beginning to answer this question. As a result, schools are developing more effective interventions by identifying variables or factors that are predictive of a student dropping out of school rather than simply being correlated with students who exit America's schools too soon. Predictors of dropping out include attendance, behavior, course performance, disrupted lifestyle (e.g., death of a parent, homelessness, becoming pregnant while in school), boredom, lack of relevancy, and being pushed out by suspension and expulsion (Jerald, 2006; Rumberger, 2004 and 1995; Allensworth and Easton, 2005; Balfanz and Legters, 2004; Roderick and Camburn, 1999; Bridgeland, DiIulio, and Morison, 2006). One salient feature of this list of predictors is the number of factors that extend beyond the reach of the school district, the school these students attend, and the classrooms in which they sit. Given the research on the characteristics associated with school dropout and the factors that are predictive of school dropout, district leaders, building administrators, and classroom teachers would be justified in feeling a sense helplessness and hopelessness when it comes to addressing America's dropout problem, much less solving it. After all, we have no control over a student's race, ethnicity, socioeconomic status, or lifestyle.

However, studies on why students drop out of school that include interviews from students that made the choice to walk away from school reveal a common factor that is well within the control of district leaders, building administrators, and, most importantly, classroom teachers (Bridgeland, DiIulio, and Morison, 2006; Balfanz and Neild, 2007; Allensworth and Easton, 2005; Rumberger, 1995 and 2004). This common factor is student engagement. In all of the studies involving student interviews, a common thread in each dropout's response was that classes were not interesting, they did not like school, or they did not find learning relevant (Bridgeland, DiIulio, and Morrison, 2006; Rumberger, 1995 and 2004). All students included in these studies expressed some level of disengagement with the school, classroom, and/or teacher. In fact, Rumberger (2004) found that above and beyond student background variables and prior academic achievement, student engagement is a very strong predictor of dropping out.

Similarly, the 2009 High School Survey of Student Engagement (HSSSE) conducted by the Center for Evaluation and Education Policy at Indiana University reported that 66 percent of students surveyed indicated that they were bored on at least a daily basis, 49 percent reported they were bored every day, and 17 percent of the respondents reported they were bored in every class (Yazzie-Mintz, 2010). Similar to earlier findings (e.g., Bridgeland, DiIulio, and Morrison, 2006; Rumberger, 1995 and 2004), HSSSE found that respondents attributed their reported boredom to the material not being interesting, lack of relevance in the material, the work not being challenging enough, the work being too challenging, and limited student-teacher relationships (Yazzie-Mintz, 2010). How does this connect to the dropout problem? The HSSSE also found that students who reported that they considered dropping out of school

did so because they did not like school, did not see value in what they were being asked to do in school, or did not like their teachers. This further highlights Rumberger's (2004) findings that above and beyond student background variables and prior academic achievement, student engagement is a strong predictor of dropping out.

THE SOLUTION: STUDENT ENGAGEMENT

Students spend approximately 30 percent of their waking time in school. From kindergarten to twelfth grade, this adds up to about 13,000 hours (Jensen, 2005 and 2009). As research has continued to demonstrate, school-level, classroom-level, and teacher-level factors are associated with and predictive of students' decision to drop out of school (Bridgeland, DiIulio, and Morrison, 2006; Yazzie-Mintz, 2010). These factors fall under the overarching concept of student engagement. Given that these engagement factors are related to instructional content and material as well as student-teacher relationships, the most immediate and relevant action that we can take as classroom teachers is to focus on student engagement; something that is well within our control. Simply put, it is all about engagement.

The decision of a student to disengage from what is happening in the classroom and then school in general is something that does not happen during a single day or school year. Instead, disengagement is a process that evolves as a result of years of experiences (Christenson, Sinclair, Lehr, and Godber, 2001). Engagement, on the other hand, can be sparked immediately based on the environmental conditions of a single K–12 classroom or the actions and decisions of a teacher (Almarode and Miller, 2013). Student en-

gagement is both a relevant and essential component of teaching and learning across the K–12 spectrum. That is, even though high schools catch much of the attention with regard to the dropout problem, it is important that student engagement remains the centerpiece of teaching and learning during all points of the students' educational trajectory.

WHAT IS STUDENT ENGAGEMENT?

Engagement is a multidimensional concept (Fredricks, Blumenfeld, and Paris, 2004; Appleton, Christenson, and Furlong, 2008; Reschly, Huebner, Appleton, and Antaramian, 2008; Skinner, Kinderman, and Furrer, 2009). Specifically, in the classroom, a student engages in instructional content, material, and learning activities in three ways: 1) his or her personal feelings about the content, material, and learning activity; 2) his or her behaviors or actions while in the classroom; and 3) what he or she is thinking about while in the classroom. Student engagement includes emotional engagement (how the student feels), behavioral engagement (the behaviors or actions of the student), and cognitive engagement (what the student is thinking). How we as teachers set up our classrooms has a major influence on both the type and level of engagement of the students on a daily basis (Almarode and Miller, 2013). Consider the following three scenarios:

1. Mrs. Smith, an algebra 2 and trigonometry teacher, has a procedure for everything. The students walk into the room at the beginning of each period, quickly take their seats, and before the tardy bell

rings, start on the warm-up exercise for the day. Approximately five minutes after the tardy bell, Mrs. Smith moves to the front of the room and begins to go over the problems from the warm-up exercise and then moves into the day's content by working several example problems. The students quietly and furiously take notes, being careful to copy down each step involved in the worked examples. This continues for much of the class. Mrs. Smith has a reputation for having excellent classroom management. Each time her principal does a classroom walkthrough, she is commended for how all of her students are so well-behaved.

2. Mr. Jones, a middle school U.S. history teacher, is one of the most well-liked teachers in the school. As a U.S. history teacher, Mr. Jones works very hard to tie concepts in his class to current events. He does this by using documentaries, movies, and games. For example, on Nov. 22, he shows an hour-long documentary on the Kennedy assassination, and on April 14, he shows the movie *A Night to Remember* for the anniversary of the sinking of the RMS Titanic. In addition to movies and documentaries, Mr. Jones creates copious games around historical facts and information. Each time his principal does a classroom walkthrough, he is commended for his special ability to make learning fun.

3. Mrs. Taylor, a fourth-grade teacher, has high expectations for her students. She believes that pushing

> students to reach their potential is very important for their success. Mrs. Taylor fills up every single second of the day with instructional content. From the time the students enter the room at 8:15 a.m. until the time they load the buses at 3:06 p.m., Mrs. Taylor is presenting new content to her students. In language arts and mathematics, Mrs. Taylor addresses all of the Common Core State Standards. In science, Mrs. Taylor has already adjusted her unit plans to meet the Next Generation Science Standards. Each time her principal does a classroom walkthrough, she is commended for her strenuous pace and content-driven classroom. "Mrs. Taylor has those students working hard all of the time."

The ideal classroom strikes a balance between emotional, behavioral, and cognitive engagement every day, adjusting this balance based on careful monitoring of the students through observations, interaction, and feedback. Each of the three scenarios above is an example of a classroom where student engagement is out of balance. In scenario one, Mrs. Smith's classroom is heavy on behavioral engagement, but she is unaware of what her students are feeling about the material or what they are thinking about while copying down the worked examples. Let's be honest: students can copy notes all day long while thinking about other things and not feeling very good about the content. These students are likely to report that the material is not interesting, lacks relevance, and is not challenging enough. These students will also likely report that they have a less than productive student-teacher relationship (Yazzie-Mintz, 2010). After all, it is hard to connect with students or for

students to connect with you if your entire class is spent in front of the chalkboard.

In scenario two, Mr. Jones' classroom is heavy on emotional engagement, but he is unaware of what his students are doing or thinking during the documentaries and movies. Unless a specific task is assigned during a documentary or movie, what students do or think about when the lights are out is a gamble. Similarly, games are fun but may not encourage students to think about the concepts in a way that is necessary for them to develop the required level of understanding. Furthermore, students who simply want to win will not be as concerned about the material, while students who lose may disengage entirely. These students are likely to report that the material lacks relevance (all we do is watch movies and play games) or is not challenging enough (Yazzie-Mintz, 2010), and when assessed, students may find that they do not know the material.

In scenario three, Mrs. Taylor's classroom is heavy on cognitive engagement. Although a focus on standards is both a necessary and sufficient condition for student achievement, the students' brains cannot maintain a continuous flow of information without opportunities to process and reflect. Once the students' brains reach their threshold for new information in a given period, they no longer have the physical resources or the working memory capacity to make new memories or store temporary ones (Abel and Lattal, 2001; Bliss and Collingridge, 1993; Cowan, 2001; Kandel, 1997; Miller, 1956; Nilsson, Radeborg, and Björck, 2012; Silva, 2003; Smith and Foster, 2008; Squire, 1992; Squire and Cave, 1991). Teaching more content does not mean students will learn more content. In this scenario, the students will ultimately cognitively disengage simply because their brains are tired. These students are likely to report that the material is not interesting, lacks relevance,

and is too challenging, and that there are strained student-teacher relationships (Yazzie-Mintz, 2010).

AN EMOTIONALLY, BEHAVIORALLY, AND COGNITIVELY ENGAGING ENVIRONMENT

The take-home message from these three scenarios is that student engagement is multidimensional—emotional, behavioral, and cognitive—with each dimension playing an important role in maintaining overall student engagement within our classrooms. Devoting too much attention to one particular type of engagement and neglecting the other two will not produce the desired outcomes for our students.

To foster and nurture an environment that maximizes student engagement, teachers should utilize strategies and design learning activities that actively engage students behaviorally, emotionally, and cognitively. What this looks like on a daily basis will depend on the students. Some days will require more attention to emotional engagement, while other days will require more attention to behavioral engagement. However, every day requires just the right amount of attention to cognitive engagement. Students only remember what they think about (Willingham, 2009), meaning that using strategies and learning activities that encourage students to think about the concepts they must master is a must.

So what type of learning environments or characteristics of learning environments promote a balanced environment with regard to student engagement? An environment that promotes all three types of engagement should (Almarode and Miller, 2013):

- Provide opportunities for students to explicitly identify and activate prior knowledge.
- Encourage students to explicitly link their prior knowledge to new learning.
- Engage students in activities that build background knowledge.
- Use novel experiences that capture the students' attention and excite them about ideas, concepts, and topics.
- Incorporate movement to evoke positive, emotionally charged events.
- Use strategies that are behaviorally relevant to the student such as essential questions, student choice, engaging scenarios, and inconsequential competition.
- Encourage students to ask questions, make mistakes, and respond to feedback.
- Enable students to see the big picture.
- Monitor the pace of instruction by providing students with opportunities to stop, process, and reflect on their learning.
- Include continual checks for understanding that encourage students to recall and review content.

Although a thorough examination of all of these characteristics is beyond the scope of this chapter, a closer look at identifying and activating prior knowledge as well as the pace of instruction will provide a starting point for how these characteristics support a balanced approach to student engagement.

IDENTIFYING AND ACTIVATING PRIOR KNOWLEDGE

When students walk into a classroom, their decision about whether to engage in the day's content and material often hinges on their perception of whether or not they can "get it" (Marzano, Pickering, and Heflebower, 2010). By ensuring that we provide opportunities for students to explicitly identify and activate their prior knowledge, we offer them an opportunity to dig up their own background knowledge and a greater chance that they will not only feel that they can get it but that they actually will get it. Identifying and activating prior knowledge helps the brain work smarter, not harder. Research suggests that when students explicitly engage in the activation of prior knowledge, they demonstrate improved encoding, retention, and recall (Alexander, Kulikowich, and Schulze, 1994; DeWitt, Knight, Hicks, and Ball, 2012; Schneider, 1993; Tobias, 1994).

Some examples of strategies that encourage students to identify and activate prior knowledge include:

Brainstorming or Word Splash—Have students use notes from the previous class or a section of the text to create a list of key words, concepts, or phrases that they believe are important.

Concept Maps, Knowledge Maps, or Mind Maps—Have students create a mind map of previous material. The key element of this strategy is that students must develop a sentence or phrase that justifies why two or more words, concepts, or phrases are linked together on the mind map.

Talk It Out—For each of the previous two strategies, have students pair up and talk about their word splashes or concept maps. One of the most effective ways to move something from short-term memory to long-term memory is to tell someone what you know (Medina, 2008).

Think-Puzzle-Explore—Provide students with a concept or idea from a previous class. Give them time to jot down whatever they *think* they know about the concept or idea. After some time, allow students to share what they think with a neighbor or as a class. Then provide them with time to make a list of things that puzzle them about the concept or idea. Again, allow students to share what they think with a neighbor or as a class. Finally, have students develop a list of questions about the idea or concept. These questions are the basis for identifying self-perceived gaps in knowledge (Ritchhart, Church, and Morrison, 2011).

MONITORING THE PACE OF INSTRUCTION

When it comes to the pace of instruction, the "Goldilocks principle" is a good rule of thumb. If the pace of instruction is too fast, students will disengage emotionally, behaviorally, and cognitively. Similarly, if the pace of instruction is too slow, students will disengage. The pace of instruction must be just right. What is just right? The student brain can focus for about 10 to 12 minutes on the content and material most commonly found in a classroom (Baddeley,

1999; Cowan, 2001). Although this may fluctuate with age, learner background knowledge, and complexity of the content (Jensen, 2005), the 10 to 12 minute rule is a reliable bet with the human brain. This limitation is linked to specific physiological characteristics of the brain (Baddeley, 1999; Cowan, 2001; Jensen, 2005). This reliable and natural feature of the human brain does not mean that we should teach for 10 or 12 minutes and then stop. Instead, we should break up instructional time into 10 to 12 minute chunks to provide students with opportunities stop, process, and reflect on their learning throughout the class.

Some examples of strategies that monitor the pace of instruction and break up content into manageable chunks include:

Press and Release—Describes the general approach to monitoring the pace of instruction. As teachers, we should break the day or class period down into 10- to 12-minute segments. Between each segment, allow students to stop, process, and reflect (e.g., talk it out, writing exercise, word splash, mind map, etc.).

Discussion Circles—This cooperative learning strategy assigns specific roles (e.g., summarizer, mind mapper, vocabulary wizard, highlighter) and tasks to a specific chunk of content. Once students complete their specific role or task, they teach or share with their cooperative learning group.

Choice Boards—Students are given a menu of tasks associated with a specific topic. Examples of tasks include developing a set of worked examples in mathematics and teaching them to the class, developing a

brochure about the Federal Court System, making and narrating a video of a science phenomenon, or recording a read-aloud. An adaptation to the choice board is to create enough tasks so that only two or three students can sign up for each one. Then students can work in small groups and the task becomes a cooperative learning activity.

Jigsaw—Students are assigned to an expert group, similar to the discussion circles groups, in which they develop expertise in a particular idea, concept, or topic. Each member understands that he or she will be responsible to share the knowledge he or she has gained with the larger group. For example, the teacher might develop expert groups on each application of the derivative in calculus (related rates, mean value, critical points, graphing, maximization and minimization problems, and differential equations). After an allotted amount of time, students return to their base groups and teach the material to the other members of the base group (Almarode and Miller, 2013).

CLASSROOM APPLICATION

Let's revisit the scenarios from above and see how the teachers could increase engagement for their students. For Mrs. Smith, starting class by activating prior knowledge will help students generate the cognitive power needed for the day's lesson. For example, Mrs. Smith could have students work in pairs and talk through the warm-up problems (talk it out), offering each other feedback on

how they approached each problem or question. During the lesson, Mrs. Smith might consider breaking the class into ten to twelve minute chunks by working a problem, then have students teach a similar problem to their neighbor. Digging up and activating prior knowledge as well as monitoring the pace of instruction will improve the cognitive and emotional engagement of her students.

For Mr. Jones, providing opportunities for students to explicitly process the information presented in documentaries, movies, and games will engage students cognitively and help them identify the key concepts from these activities. For example, Mr. Jones could use a word splash or concept map to activate and identify what his students recall from the readings about the Kennedy assassination. Following the documentary on this national tragedy, Mr. Jones could implement a discussion circle that encourages his students to think and talk about the content of the documentary as it relates to the content of his course (e.g., how the assassination was presented in the documentary versus the textbook, historical accuracies and inaccuracies, making inferences and drawing conclusions, the national impact of the event, remaining questions, etc.).

Mrs. Taylor's students would benefit from opportunities to cognitively process the large amount of information presented each day. Rather than taking a teacher-centered approach to content, Mrs. Taylor could emotionally, behaviorally, and cognitively engage her students by using strategies that encourage students to wrap their minds around the content. Word splashes, think-puzzle-explore activities, choice boards, and jigsaws would provide her students with the opportunity to recall prior learning (word splash) and take ownership of their learning (think-puzzle-explore, choice boards, and jigsaws) while monitoring the pace of instruction.

ENGAGED STUDENTS STAY IN SCHOOL

It is all about engagement. As district administrators, building principals, and classroom teachers, we encounter factors that have a strong association with students' decision to stay in school or drop out. Many of these factors are beyond the teachers' control (minority status, poverty, family disruptions) and we cannot do anything to change these factors. However, research has continued to suggest that one very important factor associated with a student's decision to stay in school is engagement. This is a factor over which we have a lot of control. As teachers, we make decisions each day, hour, and minute in our classrooms that influence the level of student engagement. Ensuring that we foster and nurture an educational environment that emotionally, behaviorally, and cognitively engages our students makes the most of the small portion of the time students spend in our classrooms. If we want to address the dropout problem, we have to start with engagement. If we want to engage students, we have to include their emotions, their behaviors, and their brains.

References

Abel, T., & Lattal, K. M. (2001). Molecular mechanisms of memory acquisition, consolidation and retrieval. *Current Opinion in Neurobiology, 11,* 180–187.

Alexander, P. A., Kulikowich, J. M., & Schulze, S. K. (1994). How subject-matter knowledge affects recall and interest. *American Educational Research Journal, 31*(2), 313–337.

Allensworth, E., & Easton, J. (2005). *The on-track indicator as a predictor of high school graduation.* Chicago, IL: Consortium for Chicago School Research.

Alliance for Excellent Education. (2009). *The high cost of high school dropouts: What the nation pays for inadequate high schools.* Washington, DC: Author. Retrieved from http://www.all4ed.org/about_the_crisis/impact/economic_analysis/

Almarode, J. & Miller, A. M. (2013). *Captivate, activate, and invigorate the student brain in science and math, grades 6–12.* Thousand Oaks, CA: Corwin Press.

Appleton, J., Christenson, S., & Furlong, M. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45,* 369–386.

Baddeley, A. (1999). *Essentials of human memory.* Philadelphia, PA: Psychology Press.

Balfanz, R., & Legters, N. (2004). Locating the dropout crisis: Which high schools produce the nation's dropouts? In G. Orfield (Ed.), *Dropouts in America* (pp. 57–84). Cambridge, MA: Harvard Education Press.

Balfanz, R., & Neild, R. (2007). *Unfulfilled promise: The dimensions and characteristics of Philadelphia's dropout crisis, 2000–2005.* Philadelphia: Project U-Turn.

Bliss, T. V. P., & Collingridge, G. L. (1993). A synaptic model of memory: Long-term potentiation in the hippocampus. *Nature, 361,* 31–39.

Bridgeland, J. M., DiIulio, J. J., & Morison, K. B. (2006). *The silent epidemic: Perspectives of high school dropouts.* Report by Civic Enterprises.

Christenson, S. L., Sinclair, M. F., Lehr, C. A., & Godber, Y. (2001). Promoting successful school completion: Critical conceptual and methodological guidelines. *School Psychology Quarterly, 16*(4), 468–484.

Cowan, N. (2001). The magical number 4 in short-term memory: A reconsideration of mental storage capacity. *Behavioral and Brain Sciences, 24,* 87–185.

DeWitt, M. R., Knight, J. B., Hicks, J. L., & Ball, B. H. (2012). The effects of prior knowledge on the encoding of episodic contextual details. *Psychonometric Bulletin Review, 19,* 251–257.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 49–109.

Gleason, P., & Dynarski, M. (2002, January). Do we know whom to serve? Issues in using risk factors to identify dropouts. *Journal of Education on Students Placed at Risk, 1*(7), 25–41.

Jensen, E. (2005). *Teaching with the brain in mind* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Jensen, E. (2009). *Teaching with poverty in mind: What being poor does to kids' brains and what schools can do about it.* Alexandria, VA: Association for Supervision and Curriculum Development.

Jerald, C. (2006). *Dropping out is hard to do.* Washington, DC: The Center for Comprehensive School Reform and Improvement.

Kandel, E. R. (1997). Genes, synapses, and long-term memory. *Journal of Cell Physiology, 173,* 124–125.

Levin, H., Belfield, C., Muennig, P., & Rouse, C. (2007, January). *The costs and benefits of an excellent education for all America's children.* New York: Center for Benefit-Cost Studies of Education at Columbia University, Teachers College, Columbia University. Retrieved from http://www.cbcse.org/media/download_gallery/Leeds_Report_Final_Jan2007.pdf

Marzano, R. J., Pickering, D. J., & Heflebower, T. (2010). *The highly engaged classroom.* Bloomington, IN: Solution Tree.

Medina, J. (2008). *Brain rules: 12 principles for surviving and thriving at work, home, and school.* Seattle, WA: Pear Press.

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63,* 81–97.

National Center for Education Statistics (2012). *The condition of education. Status dropout rates (Indicator 33-2012).* Washington, DC: Institute of Education Sciences.

Nilsson, A., Radeborg, K., & Björck, I. (2012). Effects on cognitive performance of modulating the postprandial blood glucose profile at breakfast. *European Journal of Clinical Nutrition, 66,* 1039–1043.

Reschly, A., Huebner, E., Appleton, J., & Antaramian, S. (2008). Engagement as flourishing: The contribution of positive emotions and coping to adolescents' engagement at school and with learning. *Psychology in the Schools, 45,* 419–431.

Ritchhart, R., Church, M., & Morrison, K. (2011). *Making thinking visible: How to promote engagement, understanding, and independence for all learners.* San Francisco, CA: Jossey-Bass.

Roderick, M., & Camburn, E. (1999). Risk and recovery from course failure in the early years of high school. *American Educational Research Journal, 36,* 303–343.

Rouse, C. (2005, October). The labor market consequences of an inadequate education. Paper presented at the symposium on the social costs of inadequate education, Teachers College, Columbia University, New York.

Rumberger, R. W. (1995). Dropping out of middle school: A multilevel analysis of students and schools. *American Educational Research Journal, 32*(3), 583–625.

Rumberger, R. W. (2004). Why students drop out. In G. Orfield (Ed.), *Dropouts in America: Confronting the graduation rate crisis* (pp. 131–156). Cambridge, MA: Harvard Education Press.

Schneider, W. (1993). Domain-specific knowledge and memory performance in children. *Educational Psychology Review, 5*, 257–273.

Silva, A. J. (2003). Molecular and cellular cognitive studies of the role of synaptic plasticity in memory. *Journal of Neurobiology, 54*, 224–237.

Skinner, E., Kinderman, T., & Furrer, C. (2009). A motivational perspective on engagement and disaffection: Conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement, 69*, 493–525.

Smith, K. A. (2000). Going deeper: Formal small-group learning in large classes. *New Directions for Teaching and Learning, 81*, 25–46.

Smith, M. A., & Foster, J. K. (2008). Glucoregulatory and order effects on verbal episodic memory in healthy adolescents after oral glucose administration. *Biological Psychology, 79*, 209–215.

Squire, L. R. (1992). Memory and the hippocampus: A synthesis from findings with rats, monkeys, and humans. *Psychological Review, 99*(2), 195–231.

Squire, L. R., & Cave, C. B. (1991). The hippocampus, memory, and space. *Hippocampus, 1*(3), 269–271.

Tobias, S. (1994). Interest, prior knowledge, and learning. *Review of Educational Research, 63*, 37–54.

Willingham, D. T. (2009). *Why don't students like school? A cognitive scientist answers questions about how the mind works and what it means for the classroom.* San Francisco: Jossey-Bass.

Yazzie-Mintz, E. (2010). Charting the path from engagement to achievement: A report on the 2009 high school survey of student engagement. Bloomington, IN: Center for Evaluation & Education Policy.