

**Academic Mindsets as a Critical Component of Deeper Learning**

April 2013

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A White Paper prepared for the William and Flora Hewlett Foundation

## The William and Flora Hewlett Foundation's Deeper Learning Framework

In 2010, the William and Flora Hewlett Foundation's Education Program announced its strategic focus centered on "deeper learning." The Foundation's Board of Directors has made clear its commitment to supporting an approach to K-12 and community college education in the United States to prepare students for a rapidly changing world, with the ultimate goal of increasing economic opportunity and civic engagement, particularly for children and youth in high-poverty communities. According to the Education Program's strategic plan, reaching this goal requires "improving what students learn, how they learn it, and how they demonstrate their knowledge."<sup>1</sup> The Foundation asserts that American public schools must significantly "shift course" in their approach to teaching, learning, and assessment to ensure that students develop the skills, knowledge, and competencies they will need to meet the quickly evolving demands of life, work, and global citizenship in the 21<sup>st</sup> century. The Hewlett Foundation set its strategic priorities to promote these shifts in schooling practices – to "provide all students with access to rigorous, relevant, and innovative educational opportunities"<sup>2</sup> – so that every young person in the United States would graduate from high school well-prepared to actively engage in the world.

To meet its ambitious goals and guide funding in this area, the Hewlett Foundation developed a framework articulating the components of deeper learning, drawing on current research and expert opinion by commissioning research briefs and interviewing leading thinkers in education, business, and public policy. The deeper learning framework identifies key content knowledge, academic skills, and learning competencies that should be the products of any child's K-16 education. The original framework included five components:

- master core academic content through
- critical thinking and complex problem solving,
- working collaboratively
- communicating effectively, and
- learning how to learn.

Students who developed these competencies over the course of their elementary, secondary, and postsecondary schooling would be able to productively engage in work and civic life. The deeper learning framework was intended to provide educators, school administrators, reformers, and policymakers with clear guideposts for the goals of a K-16 education.

The Hewlett Foundation set a high bar for the competencies it included in the deeper learning framework. The core criteria for inclusion were that competencies must be *measurable, teachable, and evidence based*. The Foundation recognized that measures of important competencies may still be in their infancy in some cases, but it chose to only include competencies that could be clearly conceptualized and for which measures existed or were being developed. The deeper learning framework also included only competencies

which could be taught and learned, rather than qualities understood to be innate or immutable. Finally, the Foundation only included competencies for which there was reasonably strong evidence of their relationship to positive life outcomes, particularly in relation to economic opportunity and civic engagement.

For the Foundation to make wise, targeted investments that yield desired results, the components of deeper learning must be clearly articulated and the guiding framework must accurately reflect the best understanding to date of how and why learning happens, as well as the instructional, psychological, and material conditions that support deeper learning. To that end, the Hewlett Foundation recently announced the addition of a sixth component in its deeper learning framework: “Develop academic mindsets.” This competency meets the Foundation’s core criteria of being measurable, teachable, and evidence-based, and adds a critical component to the overall deeper learning framework. Drawing upon ongoing research activity, this paper lays out the rationale for and evidence supporting the inclusion of academic mindsets as an essential part of deeper learning.

### **Academic Mindsets as Motivational Components of Deeper Learning**

The original components of the deeper learning framework represent important processes and products of deeper learning instructional practices. What was missing from the framework, however, were the motivational components that influence a student’s engagement in learning. Why and under what conditions might students choose to employ problem-solving skills or engage in collaborative work to meet a learning goal? What motivates students to expend the energy to master core academic content? In essence, what would be the energy source that could fuel students’ engagement in deeper learning activities? Academic mindsets are “the psycho-social attitudes or beliefs one has about oneself in relation to academic work,”<sup>3</sup> and these attitudes and beliefs are often what compel students to engage in learning – or not. As psychology researchers Carol Dweck, Gregory Walton, and Geoffrey Cohen put it, “students need to think of themselves and school in certain ways in order to want to learn and in order to learn successfully.”<sup>4</sup>

The inclusion of academic mindsets in the deeper learning framework puts due emphasis on a crucial set of learning variables. First, positive academic mindsets are associated with the persistent academic behaviors that lead to learning. Recent research reviews by the National Research Council, the University of Chicago Consortium on Chicago School Research (CCSR), and the John W. Gardner Center at Stanford University all concluded that students’ psycho-social beliefs and attitudes have a profound effect on their engagement and learning in school.<sup>5</sup> In this way, academic mindsets can be seen as precursors to or motivators for participation in deeper learning instructional activities. Second, academic mindsets are also likely products of deeper learning experiences. Ideally, over the course of students’ K-16 school experience, children and youth will come to see themselves as competent, productive people able to contribute meaningfully to their communities and the larger world. As students engage in deeper learning experiences and develop the other five deeper learning competencies, another likely outcome is the development of an efficacious

sense of self, a valuing of education, and a positive disposition toward further learning. Academic mindsets are therefore both motivators for and outcomes of engagement in deeper learning experiences. Below are brief summaries of the research on academic mindsets that support its inclusion as a core component of deeper learning.

### **Academic Mindsets as Drivers of Academic Perseverance and Academic Behaviors Essential for Deeper Learning Outcomes**

In June 2012, our research team at CCSR published a critical literature review on “noncognitive factors” in student learning – meaning the skills, attitudes, beliefs, and strategies that play a role in school performance but which are not directly measured by most “cognitive” academic tests. We focused on academic performance, as measured by course grades and GPA, as our outcome of interest because grades are strong predictors of future educational attainment,<sup>6</sup> which in turn strongly predicts adult earnings, civic engagement, and a wealth of other positive adult outcomes.<sup>7</sup> In our review, we found that *Academic Behaviors* (attending class, doing homework, engaging in classroom activities, studying) have the most proximal relationship to grades. The most direct way to improve students’ academic performance is to improve their academic behaviors (i.e., increasing their attendance, increasing the amount they study, increasing the number of assignments they complete, and/or improving their class participation). Also important are the quality, intensity, and duration of effort invested in these academic behaviors, a factor we referred to as *Academic Perseverance* (i.e., tenacity or grit). The more perseverance a student exhibits, the more likely he or she is to attend class even when other things interfere, to complete homework even when it is challenging, and to continue pursuing academic goals even when setbacks or obstacles get in the way.

The research evidence suggests that one of the best levers for increasing students’ perseverance and improving their academic behaviors is by supporting the development of *Academic Mindsets*. Students with positive academic mindsets work harder, engage in more productive academic behaviors, and persevere to overcome obstacles to success. Conversely, students with negative mindsets about school or about themselves as learners are likely to withdraw from the behaviors essential for academic success and to give up easily when they encounter setbacks or difficulty.<sup>8</sup> Intervention research has demonstrated that academic mindsets are malleable factors that can be changed intentionally through contextual or instructional variables.<sup>9</sup> This suggests that the most fruitful way to improve academic perseverance and to help students build the other competencies associated with deeper learning is to attend to the development of positive academic mindsets.

The CCSR report identified four key mindsets, each of which is independently associated with increased perseverance, better academic behaviors, and higher grades. These mindsets draw directly from seminal research on human motivation and basic psychological needs. In our review, we expressed these four mindsets in the first person from the point of view of the learner:

- 1) *I belong in this academic community.* Maslow noted long ago that one of our basic human needs is for “belongingness” and “a place in [one’s] group.”<sup>10</sup> In an academic setting, this refers to students’ sense of connectedness to peers and adults in their classes and their school. Belonging is particularly important in an educational context because human learning is socially constructed: we come to understand the world through our interaction with others.<sup>11</sup> Feeling part of a community of learners is a powerful motivator. Students with a strong sense of academic belonging see themselves as members of not only a social community, but an intellectual community. They tend to interpret setbacks and difficulty in their studies as a normal part of learning, rather than as signs that they are “out of place” in a particular academic environment.<sup>12</sup> Conversely, students who do not feel a sense of belonging in school tend to withdraw from interaction with their peers; to the extent that they associate academic work with their sense of alienation from the school community, they are likely to put forth little effort to learn.<sup>13</sup>

A large study of students in grades 4-6 across six school districts found that students’ sense of belonging in school was positively related (with moderate to large effects) to their enjoyment of class, liking for school, and task orientation toward learning, as well as being significantly (but more weakly) related to mean reading scores.<sup>14</sup> In a separate intervention study designed to mitigate the effects of “belonging uncertainty” on college freshmen, researchers found improved grades over time among African American students in the treatment group significant enough that the black-white grade gap was reduced 79 percent by senior year. Researchers also found effects on the health and well-being of African American students in the treatment condition, who, three years post-intervention, reported better health and fewer doctor visits than African American students in the control group.<sup>15</sup> Further, the percentage of African American students in the top quartile of their class had tripled following the intervention due to improved performance among treated students.<sup>16</sup>

- 2) *I can succeed at this.* The degree to which students believe they are “good” at a particular kind of task or field of study is strongly associated with academic perseverance. Research shows that self-efficacy and the belief in one’s likelihood of success are generally more predictive of academic performance than one’s actual measured ability.<sup>17</sup> Individuals more willingly engage in tasks of any kind when they anticipate success.<sup>18</sup> For students to expend the sustained effort necessary for learning, they must believe their efforts will be successful. This mindset also derives from our basic “need or desire for a stable, firmly based, (usually) high evaluation of [our]selves, for self-respect, or self-esteem, and for the esteem of others.”<sup>19</sup>

Students who anticipate failure or believe they cannot do something well will likely refrain from investing effort or devalue the importance of the task in order to maintain a sense of their own competence.

Studies of children's self-efficacy have found that, within each level of math ability (i.e., high, medium, and low ability), students with greater math self-efficacy outperformed their similar-ability peers.<sup>20</sup> In studies of students' math performance, the direct effect of self-efficacy was as strong as the effect of ability.<sup>21</sup> Researchers have found similar effects of self-efficacy beliefs across a variety of other academic domains and contexts.<sup>22</sup> Research suggests that students who believe they will succeed at an academic task are more likely to persist longer in the task and use cognitive and metacognitive strategies that improve their performance.<sup>23</sup> There is also clear empirical evidence that self-efficacy is malleable. Providing feedback on students' prior performance (e.g., commenting that students have been working hard), feedback on ability (e.g., commenting that students are good at a particular academic task), setting goals, or providing skill training all had the effect of increasing students' expectations of success as well as their performance.<sup>24</sup>

- 3) *My ability and competence grow with my effort.* Much attention has been given to what Carol Dweck calls a "growth mindset," which relates to one's ideas about the nature of intelligence. Students with a growth mindset believe that "the brain is like a muscle" that gets stronger with use. Accordingly, growth-mindset students are more likely to interpret academic challenge or mistakes as opportunities to learn and develop their brains.<sup>25</sup> Having a growth mindset is also associated with a "mastery goal orientation," meaning that students are motivated by wanting to learn as much as they can in order to master the material; they enjoy challenging themselves to take on the next new idea.<sup>26</sup> Dweck contrasts a growth mindset with a "fixed mindset." Students with a fixed mindset think of intelligence as something that is predetermined and not within their control. Students with fixed mindsets are more likely to be performance oriented rather than mastery oriented, meaning that they are motivated either by the desire to show off their smarts by outperforming others or by their desire to not look dumb by underperforming. Unfortunately, neither of these manifestations of performance orientation is associated with perseverance. Students motivated to outperform others tend to give up quickly when success does not come easily. Students who are driven by the desire to hide what they fear is a substandard level of intelligence are likely to refrain from engaging in a task at all, lest they risk public failure.<sup>27</sup>

In an experiment designed to encourage growth mindsets in college students, researchers found that students in the treatment group had higher GPAs the

following term (average = 0.23 grade points) and that, among African American students, those in the treatment group reported higher levels of enjoyment and engagement in school following the intervention.<sup>28</sup> In a study of seventh graders with declining math scores, those in a randomized treatment group focused on the development of a growth mindset were able to stabilize their grades, ending the school year with an average 0.30 higher grade points than their peers in a control group.<sup>29</sup> Measures before and after the intervention also showed that students in the treatment group changed their understanding of the brain as well as their beliefs about intelligence during the study period, suggesting the malleability of student mindsets. In further evidence that growth mindsets can be cultivated, researchers found that “retraining” students to attribute poor academic performance to a lack of effort or to the use of an ineffective strategy (rather than a lack of ability) “has been shown to produce sizeable changes in persistence in the face of failure, changes that persist over time and generalize across tasks.”<sup>30</sup>

- 4) *This work has value for me.* Human beings are continually interpreting and making meaning of experience. Our brains naturally look for connections in order to process new information and ideas. For academic work to penetrate students’ consciousness and become a focus of attention, it has to mean something to them.<sup>31</sup> Students value academic tasks and topics that connect in some way to their lives, their future educational pursuits/careers, or their current interests. When students value their coursework, they are much more likely to expend effort on completing it. The value a student places on a given academic task is strongly associated with both persistence and performance on that task.<sup>32</sup> When a task is not valued, students have to expend significantly more energy to focus their attention on it; further, they are much less likely to remember information related to it.

Researchers tested the importance of value in an intervention study with ninth-grade science students. Students in the treatment group were asked to write about how the weekly science topics applied to their lives. Students in the control group instead wrote summaries of the weekly science topics. Students in the treatment group who entered ninth grade with low expectations for success in science earned significantly higher grades (average=0.80 grade points difference) than students in the control group. Students in the treatment group also reported higher interest in science after the intervention and indicated wanting to take more science courses.<sup>33</sup> In a similar study with seventh-graders, students who wrote about values that were important to them in connection with school earned higher grades than students in the control group; the largest effects were seen with low-performing African

American students, who increased their grades by 0.41 grade points, an improvement which was sustained over two years.<sup>34</sup>

Across a broad collection of studies and lines of research, the evidence strongly supports the relationship between positive academic mindsets, increased academic perseverance, and improved academic performance. In short,

When a student feels a sense of belonging in a classroom community, believes that effort will increase ability and competence, believes that success is possible and within his or her control, and sees school work as interesting or relevant to his or her life, the student is much more likely to persist at academic tasks despite setbacks and to exhibit the kinds of academic behaviors that lead to learning and school success. Conversely, when students feel as though they do not belong, are not smart enough, will not be able to succeed, or cannot find relevance in the work at hand, they are much more likely to give up and withdraw from academic work, demonstrating poor academic behaviors which result in low grades.<sup>35</sup>

Low grades, in turn, predict lower educational attainment and poor career and civic outcomes.

Thus, academic mindsets are critical levers for increasing student engagement and the persistence necessary to develop the other five deeper learning competencies. Moreover, research across a range of studies suggests that educators play a key role in building positive mindsets. Students' academic identities and attitudes and beliefs about schooling are strongly influenced by the school and classroom environment in which learning is situated; the structure of academic work, goals, support, and feedback in that environment; and the implicit and explicit messages conveyed to students about themselves in relation to that academic work.<sup>36</sup> Increasing student motivation to learn is ultimately contingent upon "creat[ing] a set of circumstances in which students take pleasure in learning and come to believe that the information and skills they are being asked to learn are important and meaningful for them and worth their effort, and that they can reasonably expect to be able to learn the material."<sup>37</sup>

### **Academic Mindsets and Identity Development**

In addition to motivating a student's engagement in deeper learning instructional practices, positive academic mindsets can also be seen as important deeper learning *outcomes*. The outcomes of schooling are not only content knowledge and academic competencies, but also the people that students become from having participated in their educational experiences. To develop young adults with a positive and efficacious sense of self and confidence in their abilities to engage with and contribute to the world, schools need to provide deeper learning opportunities in which students can follow their interests, strengthen bonds with peers, collaborate with a diverse range of people, build their



competence over time, and come to see that accomplishment is built upon sustained hard work.

Unfortunately, it is too seldom the case that students get these opportunities in school, particularly in urban districts serving low-income and racial/ethnic minority students. Rather than building students' content knowledge, problem-solving abilities, collaborative capacities, communication skills, and learning strategies over time, traditional urban schools too often fail to provide opportunities for students to develop deeper learning competencies. Instead, they rely on rote, low-level instruction and reinforce to students messages of inadequacy and limited potential. Thus, a significant percentage of young people leave school "thoroughly trained in failure," to borrow a phrase from Leonard Ayres.<sup>38</sup> Across a number of U.S. cities, rather than inspiring students to work hard and meet rigorous academic standards, it is common for urban school systems to see half their students fail at least one course upon entry to high school, with upwards of a third of ninth graders routinely failing three or more courses.<sup>39</sup> Academic failure reduces students' interest in school and attenuates their relationship to whole fields of study that might have otherwise provided potential career opportunities. Currently about 25 percent of American youth drop out of high school without a diploma,<sup>40</sup> generally after repeated failure and deepening credit deficiency. For chronically failing students – or for students in chronically failing schools – the most important result of schooling may be not only a lack of knowledge and skills, but an image of themselves as having little to offer and few capabilities worth developing.

Decades of research consistently conclude that the consequences of academic disengagement are detrimental and debilitating, setting off a downward spiral of low self-esteem, impeded effort, and escalating failure.<sup>41</sup> Pockets of exceptional schools across the country serving low-income and racial/ethnic minority students have demonstrated ways to engage students' interest and provide opportunity and support for them to meet high academic standards. We should no longer accept the myth that struggling students don't care about their education or that failure is the best they can do. The evidence is clear that failure in this context has "a negative and sometimes devastating effect" on a student's sense of self, making young people "feel incapable and inadequate" rather than prepared for the future.<sup>42</sup> Certainly, schools are not fulfilling their desired public function to the extent that they take in young children who are able and naturally eager to learn and over the course of 12 or 16 years produce young adults with few marketable skills and who have become convinced of their intellectual deficiency. By neglecting to consider the psychosocial dimensions of students' schooling experience, teachers, administrators, policymakers, and education reformers can inadvertently enact policies and practices that cause irreparable harm to children.

A more holistic view requires that the goals of K-16 education include the development of students' content knowledge, problem-solving skills, and related academic competencies as well as the development of efficacious young people whose confidence is solidly based in demonstrated expertise. The graduates of an education system focused on developing the six deeper learning competencies will be well prepared to engage in their careers and their

communities to solve the pressing social, political, environmental, and technical problems facing us in the 21<sup>st</sup> century. The deeper learning framework will provide guidance to practitioners, researchers, and policymakers in this regard by including academic mindsets among its core competencies.

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<sup>1</sup> William and Flora Hewlett Foundation (2010, October). *Education Program Strategic Plan*. Menlo Park, CA.

<sup>2</sup> William and Flora Hewlett Foundation (2010, October). *Education Program Strategic Plan*. Menlo Park, CA.

<sup>3</sup> Farrington, C. A., Roderick, M., Allensworth, E. A., Nagaoka, J., Johnson, D. W., Keyes, T. S., & Beechum, N. (2012). *Teaching Adolescents to Become Learners: The Role of Noncognitive Factors in Academic Performance – A Critical Literature Review*. Chicago: Consortium on Chicago School Research.

<sup>4</sup> Dweck, Carol S., Walton, Gregory M., & Cohen, Geoffrey L. (2011). *Academic Tenacity: Mindsets and Skills that Promote Long-Term Learning*. Paper prepared for the Bill and Melinda Gates Foundation.

<sup>5</sup> Farrington et al. (2012); National Research Council. (2012). *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. Committee on Defining Deeper Learning and 21st Century Skills, James W. Pellegrino and Margaret L. Hilton, Editors. Board on Testing and Assessment and Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press, pp. 4-5; Strobel, Karen R. (2012, May). *Academic Motivation and School Engagement and their Links to Academic Achievement: A Follow up Report*. Paper prepared for the William and Flora Hewlett Foundation. Palo Alto, CA: John W. Gardner Center.

<sup>6</sup> Allensworth, Elaine, & Easton, John Q. (2007). *What Matters for Staying On-Track and Graduating in Chicago Public Schools*. Chicago: University of Chicago Consortium on Chicago School Research; Camara, W. J., & Echternacht, G. (2000). *The SAT I and High School Grades: Utility in Predicting Success in College*. The College Board Research Notes, RN-10, 1-12; Geiser, S., & Santelices, M. V. (2007). *Validity of High-School Grades in Predicting Student Success beyond the Freshman Year: High-School Record versus Standardized Tests as Indicators of Four-Year College Outcomes*. Research & Occasional Paper Series: CSHE.6.07. Berkeley: Center for Studies in Higher Education; Hauser, R. M., & Palloni, A. (2011). Adolescent IQ and Survival in the Wisconsin Longitudinal Study. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 66B (S1), i91-i101, doi:10.1093/geronb/gbr037; Hoffman, J. L., & Lowitzki, K. E. (2005). Predicting College Success with High School Grades and Test Scores: Limitations for Minority Students. *The Review of Higher Education*, 28(4), 455-474.

<sup>7</sup> National Research Council. (2012). *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*, p. Sum-4. Increased educational attainment has been associated with higher rates of employment; increased political participation; increased health and longevity; higher adult earnings; and improved health, development, and educational attainment of one's children. See Barton, P. E. (2005). *One-Third of a Nation: Rising Dropout Rates and Declining Opportunities*. Princeton, NJ: Educational Testing Service; Junn, J. (2005, October). *The Political Costs of Unequal Education*. Paper prepared for the symposium on the Social Costs of Inadequate Education. Teachers College, Columbia University, New York, NY; Muennig, P. (2005, October). *The Economic Value of Health Gains Associated with Education Interventions*. Paper prepared for the symposium on the Social Costs of Inadequate Education; Rouse, C. E. (2005, October). *Labor Market Consequences of an Inadequate Education*. Paper presented at the symposium on the Social Costs of Inadequate Education; Wolfe, B. L., & Haveman, Robert H., (2002, June). *Social and Non-Market Benefits from Education in an Advanced Economy*. Paper presented at the Conference Series 47, Education in the 21<sup>st</sup> Century: Meeting the Challenges of a Changing World. Federal Reserve Bank of Boston, Boston, MA.

<sup>8</sup> See Farrington et al. (2012), pp. 28-30 for a full review of research on the effects of academic mindsets on perseverance.

<sup>9</sup> For a review of this intervention research, see Yeager, D. S., & Walton, G. M. (2011). Social-Psychological Interventions in Education: They're Not Magic. *Review of Educational Research*, 81(2), 267-301.

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- <sup>10</sup> Mazlow, A. H. (1943). A Theory of Human Motivation. *Psychological Review*, 50, 370-396.
- <sup>11</sup> Vygotsky, L. S. (1958). *Mind in Society: The Developmental of Higher Psychological Processes*. Cambridge, MA: Harvard University Press; Dewey, J. (1938). *Experience and Education*. New York: MacMillan.
- <sup>12</sup> Wilson, T. D., & Linville, P. W. (1982). Improving the Academic Performance of College Freshmen: Attribution Therapy Revisited. *Journal of Personality and Social Psychology*, 42, 367-376; Wilson, T. D., & Linville, P. W. (1985). Improving the Performance of College Freshmen with Attributional Techniques. *Journal of Personality and Social Psychology*, 49, 287-293.
- <sup>13</sup> Osterman, K. F. (2000). Students' Need for Belonging in the School Community. *Review of Educational Research*, 70(3), 323-367.
- <sup>14</sup> Battistich, Victor, Solomon, Daniel, Kim, Dong-il, Watson, Marilyn, & Schaps, Eric (1995). Schools as Communities, Poverty Levels of Student Populations, and Students' Attitudes, Motives, and Performance: A Multilevel Analysis. *American Educational Research Journal*, 32(3), 627-658.
- <sup>15</sup> Walton, Gregory M., & Cohen, Geoffrey L. (2007). A Question of Belonging: Race, Social Fit, and Achievement. *Journal of Personality and Social Psychology*, 92, 82-96; Walton, Gregory M., & Cohen, Geoffrey L. (2011). A Brief Social-Belonging Intervention Improves Academic and Health Outcomes among Minority Students. *Science*, 331, 1447-1451.
- <sup>16</sup> For a more thorough review of the research on belongingness and other academic mindsets, see Dweck, Walton, & Cohen (2011); Farrington et al. (2012), pp. 28-38; Yeager & Walton (2011).
- <sup>17</sup> Bouffard-Bouchard, T. (1990). Influence of Self-Efficacy on Performance in a Cognitive Task. *Journal of Social Psychology*, 130, 353-363; Lent, R. W., Brown, S. D., & Larkin, K. C. (1984). Relation of Self-Efficacy Expectations to Academic Achievement and Persistence. *Journal of Counseling Psychology*, 31, 356-362; Pajares, F. (1996). Self-Efficacy Beliefs in Academic Settings. *Review of Educational Research*, 66, 543-578.
- <sup>18</sup> Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall; Oyserman, D. & James, L. (2009). Possible Selves: From Content to Process. In K. D. Markman, W. M. Klein, and J. A. Suhr (Eds.), *The Handbook of Imagination and Mental Stimulation*. New York: Psychology Press.
- <sup>19</sup> Mazlow (1943). A Theory of Human Motivation. *Psychological Review*, 50, 370-396.
- <sup>20</sup> Collins, J. L. (1982, March). *Self-Efficacy and Ability in Achievement Behavior*. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- <sup>21</sup> Pajares, F., & Kranzler, J. (1995). Self-Efficacy Beliefs and General Mental Ability in Mathematical Problem-Solving. *Contemporary Educational Psychology*, 26, 426-443.
- <sup>22</sup> Schunk, D. H. (1982). Verbal Self-Regulation as a Facilitator of Children's Achievement and Self-Efficacy. *Human Learning*, 1, 265-277; Schunk, D. H. (1985). Self-Efficacy and Classroom Learning. *Psychology in the Schools*, 22, 208-223; Schunk, D. H. (1996). Goal and Self-Evaluative Influences during Children's Cognitive Skill Learning. *American Educational Research Journal*, 33, 359-382; Pajares, F., & Johnson, M. J. (1996). Self-Efficacy Beliefs in the Writing of High School Students: A Path Analysis. *Psychology in the Schools*, 33, 163-175.
- <sup>23</sup> Pintrich, P. R., & De Groot, E. V. (1990). Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology*, 82, 33-40; Pintrich, P. R., & Garcia, T. (1991). Student Goal Orientation and Self-Regulation in the College Classroom. In M. Maehr & P. R. Pintrich (Eds.), *Advances in Motivation and Achievement: Goals and Self-Regulatory Processes* (Vol. 7, pp. 371-402). Greenwich, CT: JAI Press; Pokay, P. & Blumenfeld, P. C. (1990). Predicting

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Achievement Early and Late in the Semester: The Role of Motivation and Use of Learning Strategies. *Journal of Educational Psychology*, 82, 41-50.

<sup>24</sup> Schunk, D. H., (1982). Effects of Effort Attributional Feedback on Children's Perceived Self-Efficacy and Achievement. *Journal of Educational Psychology*, 74, 548-556; Schunk, D. H., & Gunn, T. P. (1986). Self-Efficacy and Skill Development: Influence of Task Strategies and Attributions. *Journal of Educational Research*, 79, 238-244; Zimmerman, B., & Ringle, J. (1981). Effects of Model Persistence and Statement of Confidence on Children's Self-Efficacy and Problem-Solving. *Journal of Educational Psychology*, 73, 485-493.

<sup>25</sup> Dweck, C. S. (2006). *Mindset: The New Psychology of Success*. New York: Random House.

<sup>26</sup> Mueller, C. M., & Dweck, C. S. (1998). Intelligence Praise Can Undermine Motivation and Performance. *Journal of Personality and Social Psychology*, 75, 33-52.

<sup>27</sup> Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. *Child Development*, 78(1), 246-263; Dweck, C. S., & Leggett, E. L. (1988). A Social-Cognitive Approach to Motivation and Personality. *Psychological Review*, 95, 256-273.

<sup>28</sup> Aronson, Joshua, Fried, Carrie B., & Good, Catherine (2002). Reducing the Effects of Stereotype Threat on African American College Students by Shaping Theories of Intelligence. *Journal of Experimental Social Psychology*, 38, 113-125.

<sup>29</sup> Blackwell, Lisa S., Trzesniewski, K. H., & Dweck, Carol S. (2007). Implicit Theories of Intelligence Predict Achievement across an Adolescent Transition: A Longitudinal Study and an Intervention. *Child Development*, 78(1), 246-263.

<sup>30</sup> Dweck, Carol S. (1986). Motivational Processes Affecting Learning. *American Psychologist*, 41, p. 1046.

<sup>31</sup> Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press.

<sup>32</sup> Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, Value, and Academic Behavior. In J. T. Spence (Ed.), *Achievement and Achievement Motivation*, (pp. 75-146). San Francisco: W. H. Freeman; Wigfield, A. (1994). Expectancy-Value Theory of Achievement Motivation: A Developmental Perspective. *Educational Psychology Review*, 6, 49-78.

<sup>33</sup> Hulleman, C. C., & Harackiewicz, J. M. (2009). Making Education Relevant: Increasing Interest and Performance in High School Science Classes. *Science*, 326, 1410-1412.

<sup>34</sup> Cohen, Geoffrey, L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive Processes in Self-Affirmation: Intervening to Close the Minority Achievement Gap. *Science*, 324, 400-403.

<sup>35</sup> Farrington et al. (2012), p. 10.

<sup>36</sup> Covington, M. V. (2000). Goal Theory, Motivation, and School Achievement: An Integrative Review. *Annual Review of Psychology*, 51, 171-200; Eccles, J. S., & Midgley, C. (1989). Stage/Environment Fit: Developmentally Appropriate Classrooms for Early Adolescents. In R. E. Ames & C. Ames (Eds.), *Research on Motivation in Education* (Vol. 3, pp. 139-186). San Diego, CA: Academic Press; Farrington, C. A. (2008). *Making Sense of F's: How High Schools Shape Students' Interpretations of and Responses to Failure*. Doctoral dissertation, University of Illinois at Chicago.

<sup>37</sup> National Research Council and the Institute of Medicine. (2004). *Engaging Schools: Fostering High School Students' Motivation to Learn*. Committee on Increasing High School Students' Engagement and Motivation to Learn. Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academies Press.

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<sup>38</sup> Ayres, L. P. (1909). *Laggards in our Schools: A Study of Retardation and Elimination in City School Systems*. Russell Sage Foundation. Philadelphia: Wm. F. Fell Co.

<sup>39</sup> Allensworth, E. M., & Easton, J. Q. (2007). *What Matters for Staying On-Track and Graduating in Chicago Public High Schools: A Close Look at Course Grades, Failures, and Attendance in the Freshman Year*. Chicago: Consortium on Chicago School Research; Legters, N., Balfanz, R., Jordan, W., & McPartland, J. (2002). *Comprehensive Reform for Urban High Schools: A Talent Development Approach*. New York: Teachers College Press; Neild, R. C., & Weiss, C. C. (1999). *The Philadelphia Education Longitudinal Study (PELS): Report on the Transition to High School in the School District of Philadelphia*. Philadelphia: Philadelphia Education Fund.

<sup>40</sup> US Department of Education. (2012). *Preparing National Students for Success: Averaged Freshman Graduation Rate: 2008-09*. Available from <http://www.eddataexpress.ed.gov/state-report.cfm?state=US&submit.x=22&submit.y=7>

<sup>41</sup> See for example: Covington M. V., & Müeller, K. J. (2001). Intrinsic versus Extrinsic Motivation: An Approach/Avoidance Reformulation. *Educational Psychology Review*, 13, 157-176; Crooks, T. J. (1988). The Impact of Classroom Evaluation Practices on Students. *Review of Educational Research*, 58, 438-481; Weiner, B. (1979). A Theory of Motivation for Some Classroom Experiences. *Journal of Educational Psychology*, 71, 3-25.

<sup>42</sup> Kaplan, D. S., Peck, B. M., & Kaplan, H. B. (1997). Decomposing the Academic Failure-Dropout Relationship: A Longitudinal Analysis. *Journal of Educational Research*, 90, 331-343.