MOTIVATION TO LEARN

What Motivates Students to Learn?
Exploring the Research on Motivation

Amber Perrell, Julia Erdie, and Theresa Kasay

University of North Carolina at Charlotte

The Deans for Impact Report (2015) posed the question "What motivates students to learn?". This article provides a more thorough exploration of the literature related to the cognitive principles of motivation outlined in this report. Specifically, the authors examine literature related to the impact of motivation on student learning, including learning interventions and strategies. This review of literature also adds to The Deans for Impact Report (2015) with research indicating the critical influence of extrinsic motivation on learning.

Keywords: Student Motivation, Intrinsic Motivation, Extrinsic Motivation, Incentives, Cognitive Science, Metacognition, Memory, Growth Mindset, Social Support Groups, Literature Review

As educators, it is important that we find interventions and strategies to help motivate students to learn. The Deans for Impact (DFI) (2015) report recommends numerous strategies to motivate student learning that are based on the cognitive sciences. This literature review outlines research regarding the impact of motivation on student learning, including learning interventions and strategies, according to Question 5 of the DFI (2015) report. The cognitive principles about motivation outlined in the DFI (2015) report include "beliefs about intelligence are important predictors of student behavior in school, self-determined motivation (a consequence of values or pure interest) leads to better long-term outcomes than controlled motivation (a consequence of reward/punishment or perceptions of self-worth), the ability to monitor their own thinking can help students identify what they do and do not know, but people are often unable to accurately judge their own learning and understanding, students will be more motivated and successful in academic environments when they believe that they belong and are accepted in those environments" (Deans for Impact Report, 2015 p. 7).

Beliefs about Intelligence are Important Predictors of Behavior

The DFI Report (2015) states beliefs about intelligence are significant in predicting student behaviors in school; furthermore, this cognitive principal is supported through research studies spanning decades (Blackwell, Trzesniewski, & Dweck, 2007; Elliott & Dweck, 1988; Kamins & Dweck, 1999; Mueller & Dweck, 1998; Smiley & Dweck, 1994). These studies explore the role of incremental theory and entity theory as it relates to a student's belief about intelligence (Blackwell et al., 2007). Additionally, the early studies focused on factors impacting motivation such as praise for ability versus praise for performance (Mueller & Dweck, 1998), learning goals versus performance goals (Elliot & Dweck, 1988; Smiley & Dweck, 1994), and person versus process (Kamins & Dweck, 1999). The later research transitions to examining the implicit theories of intelligence, incremental theory versus entity theory (Blackwell et al., 2007).

The entity theory suggests intelligence is fixed; therefore, intellectual abilities cannot be changed (Park & Kim, 2015). Students who believed they had low ability responded negatively to feedback on mistakes (Elliott & Dweck, 1988). In preschool aged children, Smiley and Dweck (1994) found students with low confidence avoided challenging tasks related to performance goals. When fifth grade students received praise for their intellectual ability after successes, the students developed the belief that intelligence is fixed and showed distress when faced with an achievement setback (Mueller & Dweck, 1998). Furthermore, there is supporting evidence of the hypothesis proposed in Kamins and Dweck's (1999) study suggesting children receiving praise related to traits can have a negative response when faced with subsequent setbacks.

The incremental theorist believes intelligence is malleable and with more effort one can increase their intelligence (Park & Kim, 2015). When learning goals were salient in the study, children sought to increase competence regardless of their perception of their skill level (Elliott & Dweck, 1988). Students praised for hard work appeared to believe intelligence is more malleable and avoided achievement setbacks (Mueller & Dweck, 1998). In preschool aged children, Smiley and Dweck (1994) found children with learning goals were more likely to choose challenging tasks in learning situations. Children who received praise on effort or strategy were less likely to experience helpless reactions when faced with a setback (Kamins & Dweck, 1999). Thus, the incrementalist theories provide support for motivation interventions that increase students' belief in their ability to learn and grow.

Furthermore, Blackwell, Trzeniewski and Dweck found that a student's beliefs about their own ability is critical to their openness to learning. The statement "children's beliefs become the mental 'baggage' that they bring to the achievement situation" (Blackwell, Trzeniewski, & Dweck, 2007, p. 259) is supported in the review of literature. Park and Kim (2015) suggest both entity and incremental theories of intelligence can impose positive and negative effects depending on the context and role of the self-critical thoughts. Blackwell, Trzesniewski, and Dweck (2007) state "a student's theory of intelligence is a key belief, one that sets up contrasting patterns of achievement motivation" (p. 258). The review of the literature supports The Deans for Impact (2015) cognitive principle that beliefs about intelligence are significant in influencing motivation and predicting student behaviors in school.

Self-Determined Motivation Leads to Better Long-Term Outcomes

The DFI (2015) report states self-determined or intrinsic motivation leads to better long-term outcomes; however, this cognitive principle is one that is highly debated in the research. The cognitive principle described in the DFI (2015) report related to extrinsic versus intrinsic motivation is largely based on the research by Deci, Koestner, and Ryan (1999). In this meta-analytic review, the authors' findings indicate that extrinsic or tangible rewards have a negative impact on intrinsic motivation (Deci et al., 1999). The authors note various findings which demean extrinsic motivators, stating that "all tangible rewards are more detrimental for children than for college students" (Deci et al., 1999, p. 656). Contrarily, Deci et al. (1999), found verbal rewards and unexpected rewards were associated with positive effects on intrinsic motivation. Overall, the DFI (2015) cognitive principle regarding self-determined motivation is largely based on this one meta-analysis in which tangible, extrinsic rewards are negatively associated with student learning and more specifically self-determination (Deci et al., 1999).

This strong perspective on the negative influence of extrinsic rewards on self-determined motivation has seen much contradictory evidence from researchers. The most compelling within the review of literature comes from Eisenberger, Pierce, and Cameron's (1999) counter meta-analyses revealing extrinsic rewards can "increase perceived autonomy; that reward ameliorated the effects of failure on intrinsic motivation; that reward contingent on meeting an absolute performance standard either increased or did not affect intrinsic motivation…, and that reward contingent on surpassing the performance of others increased intrinsic motivation" (p. 686). Additionally, the authors indicate rewards increased perceived self-determination and those rewards contingent on surpassing the performance of others actually increased intrinsic motivation (Eisenberger et al., 1999). It is important to note that the meta-analyses from Eisenberger et al. (1999) was in direct response to the Deci et al. (1999) research.

Moreover, other researchers have supported the idea that extrinsic motivation can be beneficial. Levitt, List, Neckermann, and Sadoff (2012) evaluated the influence of different types of extrinsic motivation (from monetary rewards to trophies) on student learning, finding that for elementary and middle school students, the non-monetary rewards had a greater impact. Several authors also noted a greater positive influence of extrinsic rewards on boys versus girls (Davis, Winsler, & Middleton, 2006; Levitt et al., 2012). In the study by Davis et al. (2006), the authors found boys to be more likely to internalize tangible rewards as an indication of their abilities, thus giving them more confidence and intrinsic motivation. Furthermore, Bettinger (2012) indicated extrinsic rewards were significantly impactful on less exciting tasks such as standardized testing and rewards were specifically beneficial for math learning.

Several authors highlighted the impact of extrinsic rewards on college students. These can be quite different than those in elementary and secondary education (Davis et al., 2006; Jessup-Anger, 2011). For college students, extrinsic motivators (such as a pass/fail grade versus a letter grade) seriously impacted the motivation for learning and led to a greater possibility of doing the "bare minimum" (Jessup-Anger, 2011). These findings were consistent with Davis et al. (2006) who indicated college students that experienced high extrinsic motivation in elementary and secondary education were more likely to believe it was a bad way to motivate students. Thus, the review of literature indicates extrinsic rewards can be beneficial for elementary level students, but may be perceived negatively by those in the post-secondary settings (Davis et al., 2006; Jessup-Anger, 2011).

Interestingly, the DFI (2015) report does identify the ability of educators to choose extrinsic rewards within the practical implications, thus one must presume that the authors did not intend to discourage the use of extrinsic rewards, but merely to point out that intrinsic motivation has better long-term outcomes. The various authors also do not necessarily indicate contradictory findings, but merely reflect on the varying conditions and approaches which may influence the usefulness of an extrinsic motivation system versus an intrinsic, self-determined motivation approach. However, the DFI (2015) doesn't provide clear examples or practical implications on how one can encourage a self-determined motivation through intrinsic motivation techniques. Thus, although the cognitive principle is not incorrect, it devalues the benefit of extrinsic reward systems at appropriate levels.

Ability to Monitor Their Own Thinking

The DFI (2015) report highlights self-monitoring and metacognition, the act of thinking about thinking, as an important component of learning. The report outlines multiple learning strategies and behaviors that can both positively and negatively impact student learning. The process of learning new information and monitoring that learning is affected by the practice retrieval of information (Karpicke, Butler, & Roediger, 2009), multiple strategies for learning (Wilson & Smetana, 2009; Pashler, Bain, Bottge, Graesser, & Koedinger, 2007), metamemory and model for knowing (Koriat & Levy-Sadot, 2001), heuristics and feelings of knowing (Koriat, 1993), and self-regulation and self-regulated learning (Schunk, 2008). The study also cautions that while learners can successfully monitor their thinking, their self-awareness regarding the level of mastery of material can be flawed (Karpicke et al., 2009). "When students rely purely on their subjective experience while they study...they may fall prey to illusions of competence and believe they know the material better than they actually do" (Karpicke et al., 2009 p. 478).

Research indicates when learners practice retrieval of information learning is improved. This is called the testing effect (Roediger & Karpicke, 2006). In the U.S. Department of Education's study *Organizing Instruction and Study to Improve Student Learning* (Pashler et al., 2007), the authors outline seven recommendations for instruction and study strategies and their level of effectiveness on student learning. The study found the most effective strategies for increasing learning are using quizzes to re-expose students to information and helping students build explanations by asking and answering deep questions (Pashler et al., 2007).

Tulving and Madigan (1970) stated human memory is unique because of "its knowledge of its own knowledge" (p. 477). Wilson and Smetana (2009) introduce the strategy, Questioning as Thinking (QAT), which encapsulates the concept of metacognition and the importance of asking deep questions to facilitate learning. Questioning as Thinking (QAT) is a three prong learning strategy including: (1) think alouds performed by the classroom teacher modeling cognition and thinking for students, (2) the Question Answer Relationships (QAR), an instructional scaffolding strategy to help students with thinking and answering questions and (3) self-questioning (Raphael, 1986). Wilson and Smetana's (2009) QAT framework, focuses on metacognition and self-monitoring to self-evaluate thinking and learning.

Metacognition, self-regulation and self-regulated learning (SRL) are all integral parts of the learning process. When students better understand metacognition it improves their overall learning. Koriat and Levy-Sadot's (2001) heuristics research, the process of monitoring self-learning, and the idea of feeling of knowing (FOK) found that cue familiarity and accessibility

can impact a learner's FOK. Koriat (1993) stated that one behavior that impacts metamemory is the quality of the memory process. Koriat (1993) also found that self-monitoring is an important part of students' successful memory performance, "...the accuracy of metamemory is intimately linked to the accuracy of the memory itself" (p. 631). Also, self-regulation improvements must be made internally by the learner to impact understanding (Schunk, 2008). Zepeda, Richey, Ronevich, and Nokes-Malach's (2015) research indicates that psychologists have identified self-regulated learning (SRL) as an important element for successful learning and academic achievement. Metacognitive skills, in addition to self-regulated learning, help the learner to plan, monitor and evaluate. Thus, educators should consider strategies and techniques to reinforce self-regulated learning (SRL) through the metacognitive practices which reinforce motivation toward learning.

Belonging & Acceptance

The DFI (2015) report encourages educators to consider sense of belonging and acceptance as a motivator for academic achievement. The main technique reviewed by the DFI (2015) as part of this cognitive principle was the "wise" technique. This technique recommends educators provide critical feedback focused on high expectations, while specifically addressing confidence in the student's abilities to reach those standards, and providing the resources to meet those expectations (Cohen, Steele, & Ross, 1999; Yeager, Walton, & Cohen, 2013; Yeager et al., 2014).

In multiple studies, the wise feedback technique was found to be specifically beneficial for African American student motivation to review and improve their work (Cohen et al., 1999; Yeager et al., 2013; Yeager et al., 2014). The wise critical feedback approach not only influenced motivation to learn, but also influenced perceptions of racial bias and mistrust with the school for minority students (Yeager et al, 2014). Other interventions focused on a sense of belonging also had a high impact on academic performance and normalized the racial gap in academic performance (Walton & Cohen, 2011).

Furthermore, the literature review supported the impact of belonging and acceptance on motivation at all educational levels (elementary, secondary, and post-secondary). With high school students, school belonging was associated with high academic value (enjoying school and finding school useful) and greater motivation to improve (Gillen-O'Neel & Fuligni, 2013; Yeager et al., 2014). Research with college students found that interventions intended to provide social norming related to feelings of insecurity about belonging and acceptance during the first year of college helped the students establish resiliency (Cohen, & Garcia, 2008; Walton & Cohen, 2011). Likewise, Zumbrunn, McKim, Buhs, and Hawley (2014) found student perceptions of belonging were associated with the level of motivation they had even for a particular course. Moreover, authors indicate a sense of social belonging in college can be "affected by these social representations of race when considering future academic choices" (Murphy & Zirkel, 2015, p. 19). Thus for college students, the sense of belongingness can expand beyond motivation to learn, but can also influence academic major choices and intention to persist (Murphy & Zirkel, 2015; Morrow & Ackermann, 2012; Walton & Cohen, 2011).

This literature review supported the Deans of Impact (2015) findings in which social-psychological interventions targeting a sense of belonging and acceptance have a meaningful influence on motivation (Gillen-O'Neel & Fuligni, 2013; Walton & Cohen, 2011; Yeager &

Walton, 2011; Yeager et al., 2013). The review of literature specifically recommends the use of the wise feedback techniques and a focus on high standards when providing critical feedback (Cohen et al., 1999; Yeager et al., 2013; Yeager et al., 2014). Thus, teachers at all levels are encouraged to consider how a sense of belonging and acceptance in their classrooms may impact their student's motivation to learn and to meet high expectations.

CONCLUSION

In conclusion, the Deans for Impact (2015) report offers strong support for the influence of motivation on student learning. This further dive into the literature also indicates that most of the cognitive principles recommended by the DFI (2015) are in fact supported. The literature supports ideas that beliefs about abilities and intelligence are strong motivators to future learning (Blackwell et al., 2007; Elliott & Dweck, 1988; Kamins & Dweck, 1999; Mueller & Dweck, 1998; Smiley & Dweck, 19994). As educators, this finding is key in focusing interventions toward an incremental theory of intelligence which encourages hard work and motivates students through a belief in their own ability to improve (Elliott & Dweck, 1988; Kamins & Dweck, 1999; Mueller & Dweck, 1998; Park & Kim, 2015). The literature supports the findings that students should learn to monitor their own thinking to accurately judge their own learning and understanding. This further review of the literature supports interventions focused on expansion of metacognitive practices (Tulving & Madigan, 1970; Wilson & Smetana, 2009), as well as learner focused retrieval of information (Rodiger & Karpicke, 2006; Pashler et al., 2007). Finally, the importance of belonging and acceptance as a key aspect of motivation is also supported in the literature review (Cohen et al., 1999; Yeager et al., 2013; Yeager et al., 2014). Research strongly supports the use of the wise critical feedback approach to ensure a sense of positive reinforcement for learning and acceptance (Cohen et al., 1999; Yeager et al., 2013; Yeager et al., 2014) as well as interventions focused on reducing insecurity about belonging (Cohen & Garcia, 2008; Walton & Cohen, 2011; Zumbrunn et al., 2014).

One area of concern with the DFI (2015) report is the focus on self-determined motivation. Although self-determined or intrinsic based motivation is supported in the literature as beneficial (Deci et al., 1999; Eisenberger et al., 1999); this literature review found significant sources to indicate that extrinsic motivation techniques, such as tangible rewards and trophies, can provide positive impact on student learning (Bettinger, 2012; Davis et al., 2006; Levitt et al., 2012). Thus, it is important to consider how educators can promote student learning through both self-determined motivation techniques that reinforce the beliefs in their intelligence and ability to monitor their own thinking, in addition to extrinsic motivation techniques that may be more appropriate to increase motivation on less exciting or meaningful tasks.

In summary, the impact of motivation based interventions on student learning is supported in this review of literature. Furthermore, this review of the DFI (2015) principles provides additional context and understanding of these cognitive principles. Further exploration of the interventions and the practical applications of these strategies toward increasing motivation will be provided in a supplementary article.

REFERENCES

Bettinger, E. P. (2012). Paying to learn: The effect of financial incentives on elementary school test scores. *The Review of Economics and Statistics, 94*(3), 686-698.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*(1), 246-263.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007, January/February). Implicit theories of intelligence predict achievement across adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*(1), 246-263.

Cohen, G. L., & Garcia, J. (2008). Identity, belonging, and achievement: A model, interventions, implications. *Current Directions in Psychological Science, 17*(6), 365-369.

Cohen, G. L., Steele, C. M., & Ross, L. D. (1999). The mentor's dilemma: Providing critical feedback across the racial divide. *Personality and Social Psychology Bulletin, 25*(10), 1302-1318.

Davis, K. D., Winsler, A., & Middleton, M. (2006). Students' perceptions of rewards for academic performance by parents and teachers: Relations with achievement and motivation in college. *The Journal of Genetic Psychology, 167*(2), 211-220.

Deans for Impact. (2015). *The science of learning.* Austin, TX: Deans for Impact.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the   effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125*(6), 627-668.

Eisenberger, R., Pierce, W. D., & Cameron, J. (1999). Effects of reward on intrinsic motivation - negative, neutral, and positive: Comment on Deci, Koestner, and Ryan (1999). *Psychological Bulletin, 125*(6), 677-691.

Elliott, E. S., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology*, *54*(1), 5-12.

Gillen-O'Neel, C., & Fuligni, A. (2013). A longitudinal study of school belonging and academic motivation across high school. *Child Development, 84*(2), 678-692.

Jessup-Anger, J. E. (2011). What's the point? An exploration of students' motivation to learning a first-year seminar. *The Journal of General Education, 60*(2), 101-116.

Kamins, M. L., & Dweck, C. S. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology*, *35*(3), 835-847.

Karpicke, J. D., Butler, A. C., & Roediger, H. L. (2009). Metacognitive strategies in student learning: Do students practise retrieval when they study on their own? *Memory, 17*(4), 471-479.

Koriat, A. (1993). How do we know that we know? The accessibility model of the feeling of knowing. Psychological Review, 100(4), 609-639.

Koriat, A., & Levy-Sadot, R. (2001). The combined contributions of the cue-familiarity and accessibility heuristics to feelings of knowing. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 27*(1), 34-53.

Levitt, S. D., List, J. A., Neckermann, S., & Sadoff, S. (2012). The behavioralist goes to school: Leveraging behavioral economics to improve educational performance. *National Bureau of Economic Research,* Working Paper 18165, Retrieved from http://www.nber.org/papers/w18165.

Morrow, J. A., & Ackermann, M. E. (2012). Intention to persist and retention of first-year students: The importance of motivation and sense of belonging. *College Student Journal, 46*(3), 483-491.

Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, *75*(1), 33-52.

Murphy, M. C., & Zirkel, S. (2015). Race and belonging in school: How anticipated and experienced belonging affect choice, persistence, and performance. *Teachers College Record, 117*(12), 1-57.

Park, D., & Kim, S. (2015). Time to move on? When entity theorists perform better than incremental theorists. *Personality and Social Psychology Bulletin*, *41*(5), 736-748.

Pashler, H., Bain, P. M., Bottge, B. A., Graesser, A., Koedinger, K., & McDaniel, M. (2007). Organizing Instruction and Study to Improve Student Learning. U.S. Department of Education. Washington DC: National Center for Education Research, Institute of Education Sciences.

Raphael, T. E. (1986). Teaching question and answer relationships, revisited. *The Reading Teacher, 39(6)*, 516-522.

Roediger, H. L., & Karpicke, J. D. (2006a). The power of testing memory: Basic research and implications for educational practice. *Perspectives of Psychological Science, 1*, 181-210.

Schunk, D. H. (2008). Metacognition, Self-Regulation, and Self-Regulated Learning: Research Recommendations. *Educational Psychology Review*, *20*(4), 463–467.

Smiley, P. A., & Dweck, C. S. (1994). Individual differences in achievement goals among young children. *Child Development*, *65*, 1723-1743.

Tulving, E., & Madigan, S. A. (1970). Memory and verbal learning. *Annual review of Psychology, 21*, 437-484.

Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science Magazine, 331*, 1447-1451.

Wilson, N. S., & Smetana, L. (2009). Questioning as Thinking: A Metacognitive Framework. *Middle School Journal*, *41*(2), 20–28.

Yeager, D. S., Johnson, R., Spitzer, B. J., Trzesniewski, K. H., Powers, J., & Dweck, C. S. (2014). The far-reaching effects of believing people can change: Implicit theories of personality shape stress, health, and achievement during adolescence. *Journal of Personality and Social Psychology*, *106*(6), 867-884.

Yeager, D., Walton, G., & Cohen, G. L. (2013). Addressing achievement gaps with psychological interventions. *Kappan, 94*(5), 62-65.

Zepeda, C. D., Richey, J. E., Ronevich, P., & Nokes-Malach, T. J. (2015). Direct Instruction of Metacognition Benefits Adolescent Science Learning, Transfer, and Motivation: An In Vivo Study. *Journal of Educational Psychology*, *107*(4), 954-970.

Zumbrunn, S., McKim, C., Buh, E., & Hawley, L. R. (2014). Support, belonging, motivation, and engagement in the college classroom: A mixed method study. *Instructional Science: An International Journal of the Learning Sciences, 42*(5), 661-684.