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Adaptive Motivation and Emotion in Education: Research and Principles for Instructional Design

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Abstract

Students frequently experience various types of motivation and emotion that contribute to their engagement and learning. However, translating research on motivation and emotion into educational practice and policy has so far been limited. To facilitate greater synergy among research, practice, and policy, this overview addresses educationally relevant motivation and emotion. This summary discusses different forms of motivation or emotion, their relevant theoretical basis, evidence on how they relate to academic engagement and learning, and potential classroom supports for adaptive motivation and emotion. The article concludes with five instructional design principles that can guide educators and policymakers in promoting adaptive student motivation and emotion: (a) support students' feelings of competence, (b) enhance autonomy, (c) use personally relevant and active tasks, (d) emphasize learning and de-emphasize social comparison, and (e) encourage feelings of belonging.

Keywords

motivation, emotion, education, academic engagement, academic achievement, instructional practice

Tweet

Instructional design (that emphasizes competence, autonomy, relevance, learning, and belonging) supports adaptive motivation and emotion.

Key Points

- Academic motivation includes forms related to competence (can I do this?) as well as values and goals (why do I want to do this?).
- Academic emotions involve coordinated psychological processes, including affective, cognitive, physiological, motivational, and expressive components, that affect learning.
- Adaptive motivation and emotion support students' engagement, learning, and persistence in educational contexts.
- To enhance students' most adaptive motivation and emotion, educational contexts should support feeling competent, enhance autonomy, use personally relevant and active tasks, emphasize learning and de-emphasize social comparison, and encourage feelings of belonging.

Introduction

Motivation and emotion are everywhere in classroom settings. Both are critical for supporting students' engagement and learning (Linnenbrink-Garcia & Patall, 2016; Pekrun & Linnenbrink-Garcia, 2012). Yet, both are also widely misunderstood. Thus, we begin by providing working definitions for both constructs. Next, we overview several key forms of motivation and emotion, review evidence of their links with academic engagement and learning, and discuss potential classroom supports. We close with five instructional design principles to guide both educators and policymakers as to how classrooms may most profitably promote student motivation and emotion, and note several cautions and areas for future research relevant for the translation of theory and research to educational policy and practice.

What Are Motivation and Emotion? And Why the Definitions Matter

The words *motivation* and *emotion* are part of the common vernacular; however, researchers' use of these terms often differs from everyday speech. *Motivation* refers to the processes of both *initiating* and *sustaining* behavior (Schunk, Meece, & Pintrich, 2014). Motivational researchers consider

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how students' self-related beliefs, cognitions, goals, and experiences shape engagement and learning. Motivation includes various forms related to competence (can I do this?) as well as values and goals (why do I want to do this?). Motivation is also contextual. A student's motivation may vary over time and as a function of the educational context; teacher, parent, or peer interactions; the subject area; or even the specific task. As such, altering educational contexts offers ample opportunity to support more adaptive forms of motivation.

Emotion involves systems of coordinated psychological processes, including affective, cognitive, physiological, motivational, and expressive components (Shuman & Scherer, 2014). For example, anxiety involves uneasy, nervous feelings (affective), worries (cognitive), physiological arousal, avoidance motivation, and anxious facial expression. Some authors define emotions as intense, short-lived episodes (and distinguish them from longer lasting, lower intensity affective states, that is, moods). Valence and activation further describe emotions. Valence differentiates positive states, such as enjoyment and happiness, from negative states, such as anger or boredom. Physiologically activating states, such as excitement, can be distinguished from deactivating states, such as relaxation.

Education-Related Motivation and Emotion and Relevant Theory

Extensive research addresses motivation in education (Linnenbrink-Garcia & Patall, 2016). And, there is a growing body of theoretical and empirical work on how and why emotions emerge in the classroom and their relation to engagement and learning (Pekrun & Linnenbrink-Garcia, 2012). The next section describes useful theory and reviews evidence related to five educationally relevant types of motivation: competence beliefs, causal attributions and implicit theories of intelligence, interests and values, intrinsic and extrinsic motivation, and achievement goals. We close by describing research on emotion. (Table 1 overviews these constructs.)

Competence Beliefs and Expectancies

Competence beliefs and expectancies have powerful consequences for students' academic outcomes. *Self-efficacy*, one of the most researched, refers to individuals' beliefs about their capacity to perform, that is, to execute behaviors at particular levels (social cognitive theory, Bandura, 1997). Applied to education, academic self-efficacy includes students' expectations and beliefs about their ability to learn materials, develop skills, or master tasks. Self-efficacy is future-oriented, reflecting students' beliefs about what they will be able to do, and is specific to a task (Bong & Skaalvik, 2003). Similar to self-efficacy, *achievement expectancies* reflect individuals' predictions about how well they will do on upcoming tasks (expectancy–value theory; Eccles et al., 1983). A related construct is *self-concept*, referring to cognitive beliefs about various aspects of the self, including cognitive evaluations of ability (Bong & Skaalvik, 2003). These competence-related motivation constructs overlap considerably.

Regardless of terminology, competence-related beliefs should support student learning and achievement, as believing one has control over one's own outcomes is necessary for engaging and putting forth effort in a given task. Empirical research supports this claim. Competence beliefs shape students' choices, effort and persistence, self-regulatory strategies, emotions, and achievement (Bandura, 1997; Pekrun & Perry, 2014; Usher, 2016). For example, students with higher academic self-efficacy are more likely to use metacognitive strategies, persist despite failure, experience fewer negative emotions and more positive emotions, select challenging courses, and attain higher achievement.

The educational environment can support competence beliefs (e.g., Usher & Pajares, 2008). For example, mastery experiences, vicarious experiences, verbal persuasion, and affective or physiological experiences all influence self-efficacy. In experiments, creating tasks that are well-aligned with students' existing skills (e.g., Harter, 1978), having students observe similar models successfully demonstrate a task (e.g., Schunk & Hanson, 1985), encouraging students to set specific, challenging, but attainable goals (e.g., Locke & Latham, 2002), and providing positive, encouraging, and informational feedback (e.g., Vallerand & Reid, 1988) all are strategies that support students' competence beliefs. Although school-based interventions are rare, those that utilize some combination of these strategies are generally successful in supporting perceived competence and subsequent achievement (e.g., Kitsantas, Robert, & Doster, 2004; Siegle & McCoach, 2007). For example, in one cluster-randomized intervention, the fifth-grade students of teachers trained on goal setting, providing positive feedback, and using modeling had higher self-efficacy, compared with the students of teachers who did not receive this training (Siegle & McCoach, 2007).

Causal Attributions and Implicit Theories of Intelligence

People are motivated to understand outcomes they experience, especially unexpected or negative ones (attribution theory of achievement motivation; Weiner, 1985). In their search to explain an outcome, students may arrive at many possible causal attributions (i.e., ability, effort, luck, or task difficulty). Three dimensions organize these attributions and specify why they matter: *locus*, whether the cause is internal to the individual (e.g., ability, effort) or external (e.g., luck, task difficulty), *stability* or whether the cause will persist

Table 1. Overview of Motivation and Emotion Constructs.

	Related to . . .	Supported by . . .	Design principle
Academic competence beliefs and expectancies	↑ Academic/career choices ↑ Persistence ↑ Cognitive engagement ↑ Achievement ↑ Value ↑ Positive emotions ↓ Negative emotions	Activities well-aligned with existing skills Challenging attainable goals Modeling Positive feedback	1, 2, 4
Effort attributions; growth mind-sets	↑ Persistence ↑ Achievement ↑ Expectancies ↑ Mastery goals ↑ Positive emotions ↓ Negative emotions	Focus on ability as changeable Encourage attributions to effort and strategy use	1, 4
Value and interest	↑ Academic/career choices ↑ Persistence ↑ Cognitive engagement ↑ Achievement ↑ Emotions (positive and negative)	Utility/importance of activities Opportunities for active involvement Autonomy support Use of interesting/engaging activities Support belonging/connectedness	2, 3, 5
Intrinsic motivation	↑ Persistence ↑ Cognitive engagement ↑ Achievement ↑ Creativity	Support need for autonomy (e.g., choices, provide rationales) Support need for competence (e.g., optimal challenge, structure) Support need for relatedness (e.g., positive teacher–student interactions)	1, 2, 5
Mastery goal orientations	↑ Persistence ↑ Cognitive engagement ↑ Achievement ↑ Interest ↑ Self-efficacy ↑ Positive emotions ↓ Negative emotions	Varied and interesting tasks with opportunities for collaboration Autonomy support Recognition/evaluation focused on effort/improvement, criterion-referenced Mixed ability grouping; opportunities for collaboration	1, 2, 3, 4
Positive emotions	↑ Self-efficacy ↑ Interest and value ↑ Persistence ↑ Cognitive engagement ↑ Creativity ↑ Achievement	Support positive emotions through supports for competence (control) and value (see above)	1-5

(e.g., aptitude) or be transient (e.g., effort), and *controllability* or whether the individual can control the cause (e.g., effort is controllable, luck is uncontrollable). These dimensions have different implications. For example, an internal attribution of success (e.g., high ability) elicits pride, in contrast to an external attribution (e.g., teacher help) that can elicit gratitude. Stable (vs. unstable) attributions imply that an outcome is more likely to reoccur; thus, stable failure attributions elicit hopelessness and low future expectancies, while unstable failure attributions elicit hopefulness. Controllable (vs. uncontrollable) failure attributions elicit feelings of guilt and motivation to alter the situation in the future. Overall, research supports these hypothesized patterns (Graham & Williams, 2009; Linnenbrink-Garcia & Patall, 2016).

Closely related to attributions, theories of intelligence (mind-sets) refer to beliefs about the nature of ability (Dweck, 1999). Two general mind-sets describe students' thinking about their own intelligence: *fixed mind-set*, viewing ability as a stable entity (stable and uncontrollable in attribution terms), and *growth mind-set*, thinking ability is changeable via effort (unstable and controllable). These mind-sets have consequences (Dweck, 1999; Yeager & Dweck, 2012). Individuals with a growth mind-set view effort as central to changing their intelligence, so they endorse goals to develop their competence, view setbacks as learning opportunities, and are more likely to persist after failure. Growth mind-sets are associated with more adaptive attributions, positive emotions, reduced anxiety, and higher achievement. In contrast, individuals who view intelligence as innate and stable (fixed

mind-set) are more concerned with showing others they are smart and see failure as indicating low intelligence, often leading to helplessness.

In school-based interventions, training students to endorse the notion that everyone can learn with effort and the right strategies, or to think about academic successes as controllable and academic failures as unstable, is beneficial for attributions, emotion, persistence, and performance (Perry, Chipperfield, Hladkyj, Pekrun, & Hamm, 2014; Yeager & Dweck, 2012). For example, college students who received attribution retraining to ascribe failure to controllable, unstable causes had improved perceived control, emotions, and achievement (Hall, Hladkyj, Perry, & Ruthig, 2004). Students randomly assigned to receive instruction on how the brain develops and can grow were more likely to endorse a growth mind-set and had higher academic performance (Blackwell, Trzesniewski, & Dweck, 2007).

Interest and Value

Value-related constructs address *why* an individual chooses to engage in a particular task. Value takes various forms (expectancy–value theory; Eccles et al., 1983): *utility value* (task perceived as useful to other aspects of the person's life), *attainment value* (personal importance of doing well on a task), *intrinsic value* (perceiving the task as enjoyable), and *cost* (negative aspects of engaging in the task). Relatedly, within interest research (Renninger & Hidi, 2011), *interest* includes both positive feelings (e.g., enjoyment) and valuing the importance of the domain for the self. Interest can be further differentiated into *individual interest*, which is more stable and resides within the person, and *situational interest*, which emerges from and is supported by the context.

Like competence beliefs, value beliefs also predict academic outcomes, including persistence, performance, and choice of activities (Linnenbrink-Garcia & Patall, 2016; Schiefele, 2009; Wigfield & Cambria, 2010). Research from expectancy–value theory indicates that—although competence beliefs most strongly predict performance—values most strongly predict activity choices and enrollment decisions. Moreover, interest enhances attention, cognitive processing, and persistence. Interest also relates to course grades, although the effects are not always straightforward (they may vary based on perceived competence, initial interest, and prior achievement).

A growing body of research investigates what predicts task value and interest. For instance, opportunities for active involvement, supporting autonomy, connecting course material to real life, and creating a sense of belonging or connectedness support interest in and value for science (Pugh, Linnenbrink-Garcia, Phillips, & Perez, 2015). School-based intervention research highlights successful educational strategies for supporting task value and interest: focusing on inherently interesting topics and using hands-on activities (e.g., Guthrie, Wigfield, & VonSecker, 2000) or emphasizing the usefulness or importance of educational activities through discussion, written or verbal materials, or course assignments (e.g., Hulleman & Harackiewicz, 2009; Yeager et al., 2014). In one randomized intervention involving a writing exercise, high school students with low success expectancies who were encouraged to make connections between their lives and their science course content had enhanced science interest and course grades, compared with students who simply wrote a summary of the information they were learning in class (Hulleman & Harackiewicz, 2009).

Intrinsic and Extrinsic Motivation

Closely related to value beliefs are *intrinsic motivation*, doing something for the inherent satisfaction that engaging in the activity provides, and *extrinsic motivation*, doing something because it leads to a separable outcome (e.g., praise or money; Ryan & Deci, 2000). Extensive research relates students' intrinsic motivation to adaptive academic outcomes, including creativity, academic engagement, deep conceptual learning strategies, and academic achievement (Lepper & Henderlong, 2000; Linnenbrink-Garcia & Patall, 2016).

Theoretically, innate psychological needs of autonomy, competence, and relatedness underlie intrinsic motivation (self-determination theory, e.g., Ryan & Deci, 2000). Consequently, supports for intrinsic motivation in the classroom focus on strategies to enhance the fulfillment of these three needs among students (e.g., Reeve, 2009; Skinner & Belmont, 1993). For instance, autonomy support includes providing choices, using justifications that highlight personal relevance, and using non-controlling language. Competence supports include creating a well-organized classroom structure with clear expectations, informational feedback, and tasks well-aligned with students' existing skills. Support for relatedness includes teachers taking time to interact with and be attuned to students, and facilitating interaction among students (e.g., cooperative learning).

Moreover, school-based intervention research suggests that training teachers to implement need-supportive practices benefits a range of outcomes including students' intrinsic motivation, engagement, and academic achievement (e.g., Patall, Cooper, & Wynn, 2010; Reeve, Jang, Carrell, Jeon, & Barch, 2004), although most interventions focus on autonomy support, rather than competence or relatedness. For example, students of teachers trained to be autonomy-supportive were more engaged in the classroom, relative to the students of untrained teachers (Reeve et al., 2004). Similarly, students were more intrinsically motivated to complete homework and performed better on unit tests when they received choices of homework assignments (Patall et al., 2010).

Achievement Goal Orientations

Goal orientations represent a general framework for interpreting and reacting to achievement settings (Ames, 1992).

Achievement goal theory proposes two primary reasons for individuals' engagement in achievement-related activities: *mastery*, with a focus on developing competence, and *performance*, with a focus on demonstrating competence and outperforming others. Subsequent theoretical approaches further differentiate achievement goals into approach versus avoidance goals (Elliot, 1999). For instance, students may focus on outperforming others (performance-approach) or avoiding appearing incompetent (performance avoidance).

An extensive, but largely correlational, body of research examines the relation of achievement goals to school-related outcomes (Linnenbrink-Garcia & Patall, 2016; Maehr & Zusho, 2009; Wigfield & Cambria, 2010). Students endorsing mastery goals have higher interest and self-efficacy, more positive and fewer negative emotions, higher levels of behavioral and cognitive engagement, and at least moderately high achievement, whereas performance-avoidance goals are associated with less adaptive patterns for these same outcomes. Research on performance-approach goals is more controversial. Performance-approach goals show small positive associations with some adaptive outcomes such as behavioral and cognitive engagement, interest, positive emotions, and achievement; however, these findings are inconsistent. Some research also links performance-approach goals to maladaptive outcomes such as avoidance of help seeking, test anxiety, and cheating.

Like many motivation theories, the tenets of achievement goal theory have not been thoroughly tested in school-based intervention research. However, an emphasis on effort and improvement, tolerance for mistakes, varied and challenging tasks, student autonomy, collaboration, and private, task-based feedback in educational settings may support mastery orientations (Ames, 1992). In contrast, a product focus; rewards for performance; routine, mechanistic, or easy tasks; an emphasis on teacher control; competition; and public, normative feedback all may support performance orientations. The few school-based interventions generally focus on either training teachers to adopt practices characteristic of a mastery goal structure or teaching students about goal orientations and encouraging them to adopt mastery goals; however, only limited evidence supports their success (e.g., Hoyert & O'Dell, 2006; Linnenbrink, 2005; Maehr & Midgley, 1996; Muis, Ranellucci, Franco, & Crippen, 2013).

Emotion

So far, we have focused on different types of motivation, noting their relation to emotion. However, aside from attribution research, motivation researchers rarely consider emotions as a central outcome. Thus, we now turn specifically to emotion, using control–value theory as a lens. Control–value theory simultaneously considers how control and value beliefs shape emotions and subsequent academic outcomes (Pekrun, 2006; Pekrun & Perry, 2014): Individuals experience achievement emotions when they feel in (or out of) control of valued achievement activities and outcomes. *Control appraisals*—the perceived controllability of actions and outcomes—are implied by expectations, attributions, and competence beliefs, as described earlier. *Value appraisals* relate to the subjective importance of these activities and outcomes (similar to task value). In line with theoretical expectations, empirical evidence indicates that perceived control facilitates positive emotions and reduces negative emotions, and that value increases both positive and negative emotions (except for boredom, which is reduced when value is high; Pekrun & Perry, 2014). For instance, enjoyment for learning is promoted by favorable competence perceptions (perceived control) and interest in the learning material (high value). Test anxiety is triggered by perceived low control over exam performance and high importance of the exam.

Furthermore, the downstream consequences of students' emotions relate to their engagement and learning (Pekrun & Linnenbrink-Garcia, 2012). Similar to interest and intrinsic motivation, positive activating emotions, such as enjoyment, promote high-quality learning under most conditions and in most individuals. Enjoyment enhances students' interest in learning materials, motivational engagement, attention and flow experiences, deep learning strategy use, and self-regulated learning. By contrast, negative activating emotions, such as anger and anxiety, can undermine students' learning. Specifically, although negative activating emotions can occasionally motivate students to invest effort and support detail-focused memory processes, they are typically detrimental to learning and achievement. This is most clearly illustrated for test anxiety, which reduces academic achievement. Finally, negative deactivating emotions, such as boredom, uniformly derail learning.

The vast majority of research on educational interventions related to emotions is on test anxiety. Test anxiety can be treated successfully, with cognitive–behavioral and multimodal therapies being especially effective at reducing test anxiety and enhancing performance (Zeidner, 1998). In addition, research on classroom practices and test design indicates that test anxiety is reduced by providing structure and transparency (e.g., information regarding demands, materials, and grading practices of exams), task formats that reduce working memory load (e.g., multiple-choice rather than open-ended essay questions), choice between test items, opportunities to retake tests, and relaxing time constraints, presumably because these factors enhance perceived control or reduce the importance of a single test.

Research on treatment interventions and classroom practices targeting a broader range of achievement emotions is largely lacking. However, initial evidence suggests that the practices to enhance student motivation described previously can also be beneficial to students' emotions (e.g., attributional retraining; see Pekrun, 2014; Perry et al., 2014).

Instructional Design Principles

Several common themes run across discrete theoretical perspectives and research traditions, making it possible to

identify unifying design principles to support multiple forms of motivation and emotion (see also, Guthrie et al., 2000; Martin, 2008; Pekrun, 2014; Pintrich, 2003; Turner, Warzon, & Christensen, 2011). Five central instructional design principles support the beneficial forms of motivation and emotion identified previously (see also Table 1).

Design Principle 1: Support competence through well-designed instruction, challenging work, and informational and encouraging feedback.

Competence support is critical for enhancing motivation and positive emotions (see Table 1). Various approaches support competence beliefs and in turn learning. High-quality instruction—which is well structured and paced, is cognitively clear, includes well-explained examples, and is provided by teachers with high subject-matter competence—is key. Furthermore, ensuring that students experience a sense of mastery by presenting tasks that just slightly exceed existing skills, having similar peers demonstrate how to complete challenging work, and providing positive feedback that emphasizes effort are strategies suggested by laboratory and fieldwork. Other approaches, such as attributional retraining, can also help to support competence beliefs by encouraging students to attribute failure to internal, unstable, and controllable causes (e.g., lack of effort, poor strategy use) rather than internal, stable, and uncontrollable causes (e.g., low ability). When students judge poor prior performance as due to something that they can change, they are more likely to believe they can be successful in the future, increasing persistence, engagement, and, ultimately, success. Various attributional retraining approaches are available, such as having peers provide testimony of their personal experiences or providing information to convince students that learning happens through effort and appropriate strategy use.

Design Principle 2: Support students' autonomy through opportunities for student decision making and direction.

A second key principle for enhancing motivation and positive emotions is to support feelings of autonomy (see Table 1). This can be accomplished through providing choices and opportunities for students to be active decision makers and by acknowledging students' perspectives. That is, students feel more autonomous when teachers provide an opportunity for them to express their opinions (regarding what and how they are learning in class) and teachers are responsive to their perspectives in designing or presenting learning activities. Explicit choices, for example, about the activities used to learn material, how and when to complete an assignment, with whom students will work or whether they work alone, or the focus or topic of their studies all support students' autonomy. In addition, it is important to minimize practices that make students feel they are being controlled, including using extrinsic rewards to control students or when teachers make choices for students or pressure them to think or feel a particular way (e.g., telling them where to sit, when to speak, and being overly directive; Reeve, 2009). Unfortunately, teachers may see limited opportunity to allow students to influence learning content, activities, and evaluation in the current educational climate that emphasizes standards and accountability. Even so, students benefit when teachers attempt to maximize students' opportunities to take ownership of their educational experience.

Design Principle 3: Select personally relevant, interesting activities that provide opportunities for identification and active involvement.

A key principle in supporting students' value and interest is to provide the opportunity for students to actively engage in tasks or activities that are inherently interesting, personally relevant, or make clear connections to the real world. Such tasks also support mastery goal orientations. Design Principle 3 can be enacted in a variety of ways. For instance, teachers might situate lessons on more basic concepts in the context of real-world applications of interest to students (e.g., understanding how a chemical reaction affects the way drugs are absorbed in the body). Providing opportunities for students to generate their own connections between the course material and their own lives, personal goals, and identity or to generate the pro-social purposes for learning are also effective strategies. In addition, opportunities for active involvement through working in groups, doing hands-on activities, and engaging in group discussion support interest and value.

Design Principle 4: Emphasize learning and understanding and de-emphasize performance, competition, and social comparison.

The fourth design principle aims to support mastery goals and reduce performance goals. Strategies for enacting this design principle include activities where students receive formative assessments, have multiple opportunities to revise work, and are acknowledged for the effort they put into learning. The use of rubrics with clearly described criteria for evaluation can also help to shift the focus to learning. These types of practices contrast with feedback and evaluation that directly compares students or evaluates students based on their relative performance (e.g., grading on a curve, displaying the best student's work), which are likely to encourage performance goals and potentially some of the maladaptive outcomes that can result from endorsing especially a performance-avoidance goal orientation. Notably, high-stakes testing directly contradicts this design principle, as severe consequences of failing high-stakes tests boost the importance of performance, thus increasing the endorsement of

performance-avoidance goals and negative emotions such as anxiety, shame, and hopelessness.

> **Design Principle 5:** Support feelings of relatedness and belonging among students and with teachers.

Finally, although the intervention evidence is scarce, supporting feelings of belonging and relatedness among students and between students and teachers also seems to be critical. Feeling a positive connection with teachers helps to enhance students' intrinsic motivation (Ryan & Grolnick, 1986) as well as increase their situational interest and perceived competence (Linnenbrink-Garcia, Patall, & Messersmith, 2013). There also appear to be contagion effects, such that teacher enthusiasm translates into students' feelings of enjoyment (Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009). Connection to peers is also important. Students who feel connected to their classmates report more positive emotional engagement (e.g., enhanced interest, reduced negative affect; Furrer & Skinner, 2003). This goal of creating and maintaining bonds across individuals in the classroom aligns well with the current emphasis on social emotional learning (e.g., Brackett & Rivers, 2014) in many schools across the United States. As such, this design principle may already be supported in part by current interventions.

Conclusion

Research on motivation and emotion has accumulated a wealth of evidence regarding the potential benefits of particular types of motivation and emotion for supporting students' engagement and achievement. And, there is a strong theoretical basis for designing instruction to support motivation and emotion, coupled with growing empirical evidence to support these theoretical claims. However, additional intervention research should test the effectiveness of these motivationally and emotionally supportive instructional design principles. Much of the current intervention research is based on single theoretical perspectives, with very little research examining how multiple supports for motivation and emotion function together (Lazowski & Hulleman, 2015). This focus on a single type of motivation or emotion is problematic for several reasons.

First, as is clear from our review and the five design principles, the theories overlap considerably. Thus, integration may help researchers to provide clearer, more concise recommendations for practice. Second, empirical evidence suggests that interventions targeting a specific form of motivation or emotion may function differently for some students. For instance, utility–value interventions appear most beneficial for students with low perceived competence (e.g., Hulleman & Harackiewicz, 2009). If we truly want to translate this research into practice and use it to inform policy, we need more integrative approaches that test the translation of the five instructional design principles described here into practice.

Researchers studying motivation and emotion must work more closely with educators and policymakers deciding educational reform. As noted earlier, the current emphasis on high-stakes testing and accountability runs counter to many of the design principles outlined. On a more positive note, some current reform efforts, such as the Next Generation Science Standards (NGSS) or the Common Core, may fit well with our five instructional design principles. For example, guidelines for enacting NGSS note the importance of having students engage in science and engineering practices related to real-world phenomena (National Research Council, 2015), which clearly aligns with Design Principle 3.

In summary, we know a lot about how motivation and emotion support student engagement and learning, and a growing body of research attempts to translate this research into practice. However, there is a clear need to continue these efforts, especially those evaluating the effects of interventions based on the five design principles presented here. Research must also work more closely with educators and policymakers to consider how new policies and practices may directly, or indirectly, affect student motivation and emotion and, consequently, their educational attainment and career trajectories.

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