MULTIDIMENSIONAL ENGAGEMENT IN LEARNING— AN INTEGRATED INSTRUCTIONAL DESIGN APPROACH

Hermann Astleitner, University of Salzburg

ABSTRACT

There is rising evidence that it is an increasingly difficult task for teachers to engage students in learning. This important problem in daily instruction has produced numerous research activities focusing on conditions and consequences of student engagement. However, these activities have led to a complex situation in which findings are widely scattered, redundant, or difficult to apply in instructional practice. Therefore, this paper integrates research findings on cognitive, motivational, and social-emotional aspects of student engagement based on a review of literature. Findings from the review have been used to formulate 15 instructional strategies as part of a hierarchically organized instructional design approach for incorporating multidimensional engagement into elements of learning (i.e., learning materials for lessons or instructional units). Strategies for cognitive engagement concern engagement levels such as knowledge, comprehension, convergent thinking, evaluation, and synthesis. Strategies for motivational engagement focus on attention, relevance, interest, identification, and intrinsic motivation. Strategies for social-emotional engagement are related to self-assertion, entertainment, belongingness, adaptiveness, and security. Finally, in order to support research and implementation, measurement instruments on multidimensional levels of engagement and related instructional strategies are proposed.

Keywords: Instructional design theory, student involvement, instructional materials, research synthesis, measurement

PROBLEMS IN CLASSROOMS AND MULTIDIMENSIONAL ENGAGEMENT

Life is complex and so is instruction in our classrooms. Recent developments outside the classroom that are strongly related to an increasing Internet and media use make for greater complexity for teachers and students. Wide-spread nonacademic Internet use, which is highly attractive to students, has been repeatedly found to be negatively correlated inside and outside the classroom (Dindar & Akbulut, 2016). Others have found that IQ has declined in children and adolescents over the last decades (Dutton & Lynn, 2015) with excessive media use as one major reason

for this (Rindermann, Becker, & Coyle, 2017). In addition, significant relationships have been found between media-related addiction and mental problems (Ko, Yen, Yen, Chen, & Chen, 2012), unrealistic attitudes or values (Owens, Behun, Manning, & Reid, 2012), as well as nonstandard and faulty language use (Lyddy, Farina, Hanney, Farrell, & O'Neill, 2014). Also, it has been revealed that exposure to violent media (e.g., video games) is a risk factor for increased aggression and for decreased empathy and prosocial behavior (Anderson et al., 2010). Based on this and similar developments, it might not be astonishing that a significant percentage of students have been

regarded to be impaired by psychosocial problems (Wlodarczyk et al., 2016).

Problems like these produce a negative cascade effect in the classroom: They are closely related to basic prerequisites in learning (e.g., intelligence, attention, memory, language skills, or emotional balance) that significantly influence the acquisition of knowledge and skills in the long run (Burt, Obradović, Long, & Masten, 2008; Prot & Gentile, 2014; Wigelsworth, Qualter, & Humphrey, 2017). In many cases, activities to solve such problems in the classroom have been found to lack sufficient effectiveness, efficiency, or sustainability. First, many teachers have disregarded media use and its effects completely (e.g., Kim, Kim, Lee, Spector, & DeMeester, 2013). Then, many of them have been disappointed, because integrating media, even in an educationally prudent and sensitive way, has often shown only moderate effects (on average about half a standard-deviation) (Sung, Chang, & Liu, 2016). In addition, it has been found that enhancing students' social and emotional competences in classrooms had low effectiveness (with average effect sizes of about .30), although such activities required large amounts of time and other resources (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Studies also have shown that teachers felt that they were primarily responsible for subject-related classroom learning but not for declines in skill, attention deficits, or other mental health problems (Reinke, Stormont, Herman, Puri, & Goel, 2011). Due to this conglomerate of problems in the classroom, teachers are frequently found to suffer significantly from classroom management deficits and emotional exhaustion (Dicke et al., 2014).

From a research perspective, it has been concluded that having such complex, intertwined problems within the classroom, a holistic knowledge approach about the "whole child" and multidimensional student engaging practices are needed (Sibley et al., 2017). In the field of teaching-learning research, classrooms are seen more and more as complex dynamic systems with the multidimensional characteristics of students as goal states and student engagement being a function of environmental complexity (e.g., Shernoff et al., 2016). Engagement represents the key concept of accessing and handling such complex systems and "refers to a student's active involvement and participation in school-based activities, more concretely it entails students' reactions to and interactions with the learning material" (Boekaerts, 2016, p. 81). Engagement becomes "multidimensional" when it focuses on not only cognitive but also motivational and social-emotional processes (Aubteen Darabi, Nelson, & Paas, 2007). Student multidimensional engagement represents a major issue on all educational levels and has produced numerous theoretical models, measurement attempts, and intervention approaches (Lawson & Lawson, 2013; McCormick, Kinzie, & Gonyea, 2013; Sinatra, Heddy, & Lombardi, 2015).

From an instructional design perspective, it is essential to have instructional strategies that support cognitive, motivational, and social-emotional engagement of students. In the literature, many such strategies can be found (for a comprehensive overview, see Trowler, 2010). Recently, Baeten, Kyndt, Struyven, and Dochy (2010) have presented an overview about elements of learning environments with a higher degree of student engagement that stimulate deep approaches to learning. They have considered within an eclectic approach the interactions of contextual factors (e.g., the nature of the task), perceived contextual factors (e.g., workload), and student factors (e.g., intellectual ability). Also, Zepke and Leach (2010) have presented ten general proposals for action as a conceptual organizer for student engagement with strategies like "enhance students' self-belief" to "enable students to develop their social and cultural capital" (p. 169). Guthrie, Wigfield, and You (2012) have focused on instructional strategies in student engagement that have been related to autonomy support, interesting texts, strategy instruction, collaboration, praise and rewards, methods of evaluation, and teacher involvement. Gettinger and Walter (2012) have formulated strategies for maximizing academic engaged time that integrate managerial strategies (e.g., monitor student behavior), instructional strategies (e.g., focus on explicit learning objectives), and student-mediated strategies (e.g., teach students to employ metacognitive and study strategies). Harbour, Evanovich, Sweigart, and Hughes (2015) have delivered a review of effective instructional strategies that maximize student engagement by considering modeling, opportunities to respond, and feedback. Recently, Smit, de Brabander, Boekaerts, and Martens (2017) have focused

in more detail on motivational strategies about environmental control, self-consequences, interest enhancement, performance self-talk, and mastery self-talk.

Having such similar collections of strategies for enhancing student engagement in the classroom allows the exploration, design, and evaluation of instructional methods. However, many of these instructional strategies and related approaches suffer from under-developed potentials:

- *Multidimensionality*: They do not simultaneously cover cognitive, motivational, and social-emotional aspects of learning. This is important, because it must be assumed that, for example, strategies for enhancing cognitive engagement might not work for motivational or social-emotional engagement, as indicated by separate approaches on cognitive design of instruction (e.g., the First Principles of Instruction by Merrill, 2007), motivational design (e.g., the ARCS-model by Keller, 2010), and social-emotional design (e.g.,the FEASP-approach by Astleitner,2000).

- *System-based*: They are not based on an integrated theoretical framework that allows a system perspective, subsume research findings, avoid redundancies, combine factors, or handle side or interaction effects. System-based approaches in instructional design can be found, for example, in relation to "complex learning" (Van Merriënboer & Kirschner, 2012), "intelligent tutoring" (Kulik & Fletcher, 2016), "creativity education" (Csikszentmihalyi & Wolfe, 2014), or "ecological approaches on classroom management" (Doyle, 2006).

- *Hierarchical organization*: They do not focus on modern concepts of competency-based instruction in which it is assumed that knowledge or skills are acquired step-by-step in a more or less hierarchically organized way (Voorhees & Bedard-Voorhees, 2017). Such developmental models and related teaching strategies can be found, for example, in the fields of cognitive development (Feldman, 2004), motivational development (Benson & Dundis, 2003), or moral development (Schuitema, Dam, & Veugelers, 2008). On a cognitive dimension, for example, the

hierarchically organized Bloom taxonomy (see a revision by Krathwohl, 2002), the SOLO taxonomy (Biggs & Collis, 1989), or the taxonomy by Marzano and Kendall (2008) are given. There are also, for example, noncognitive hierarchical models of self-concept (Marsh, 1990), social competence (Guralnick, 1992), or achievement motivation (Elliot & Church, 1997). Also, modern competence assessment not only deals with measuring competence alone (e.g., Leutner, Fleischer, Grünkorn, & Klieme, 2017), but also with the development of different levels of competence (Squires & Bricker, 2007). Competence development combines measurement models with support models that are based on different instructional tactics or strategies for different competence levels (Gibbs, 2013).

Goals and Methods

Based on this background, it is the goal of this paper to develop a prescriptive instructional design approach on how to support multidimensional student engagement in learning. The instructional design approach is based on the general assumptions that engagement is developed step-by-step and that different instructional strategies are necessary to foster different levels of engagement. Such a type of instructional design approach corresponds with general assumptions of instructional-design theories and models (Reigeluth & Carr-Chellman, 2009), developmental training approaches (Bennett, 1986), and aptitude-treatment-interaction principles (Connor et al., 2009). The instructional design approach includes hierarchically organized and multidimensional learning outcomes and instructional strategies that might increase the probability of achieving these outcomes. Outcomes and instructional strategies are the core elements. In order to use these core elements within instructional settings, it is necessary to implement them together within a diagnose-design-implement-evaluate cycle: First, diagnose engagement problems. Second, design instructional strategies by considering student characteristics and situational settings. Third, implement the designed strategies in classroom situations. Finally, evaluate whether the implemented strategies helped to solve the problem

in student engagement. If yes, the implementation can go on. If no, the implementation has to be adapted or recalibrated.

In order to develop such an instructional design approach, a theory development method has been used that combines methods for building instructional design theories (Reigeluth & An, 2009) and strategies for generating meaning from qualitative methods (Miles & Huberman, 1994): First, multidimensional macrotheories on student engagement are used as general heuristic frameworks to identify and delimit different types of engagement. Then, within each type of engagement, a hierarchical developmental model is established by focusing on more specific developmental processes. Finally, for each level of each type of engagement, instructional strategies are postulated. The instructional strategies are built by combining the results of a narrative review (Baumeister & Leary, 1997) about research findings in the field of Educational Research and Educational as well as Instructional Psychology. Overall, it is the goal of this paper to integrate research findings, establish a multidimensional framework, and focus on hierarchically organized developmental processes.

This paper is based on a review of literature without covering primary studies in detail. It is more of an "umbrella review" (Grant & Booth, 2009) that focuses on evidence from other reviews, meta-analyses, integrative approaches, and models. The focus is on the main research from about the last ten years not on achieving full coverage. The goal of the review was not to decide the effectiveness or noneffectiveness of instructional strategies (as in the case of meta-analyses), but to explore effective and easy-to-use strategies that could be used in order to improve instructional planning, implementing, and evaluating in the daily classroom. The findings from the research have been used for stimulating the building of a general theory and not for testing the effectiveness of specific instructional strategies. The whole instructional design approach presented in this paper can be regarded as a research- and system-based framework for instructional problem-solving on multidimensional engagement in learning. It can be used by researchers, instructional designers, teacher educators, teachers, and students.

THE INSTRUCTIONAL DESIGN APPROACH

Of course, there are many models dealing with specific cognitive, motivational, or social-emotional aspects of student engagement in classroom contexts (for overviews, see Christenson, Reschly, & Wyle, 2012; Dunne & Owen, 2013). For achieving the goal of this paper, however, it is necessary to have more general models that integrate cognitive, motivational, and social-emotional variables. A starting point is an integrating framework on school engagement contexts by Furlong et al. (2003). Within this framework, engagement represents an intermediate learning outcome that is "behavioral" (on participation), "affective" (on bonding, belonging, attachment), and "cognitive" (on identification, membership). A second approach represents a model of school engagement by Wang, Willett, and Eccles (2011). In their model, school engagement has three dimensions: "behavior" (related to attention, compliance), "emotion" (belonging, valuing), and "cognition" (regulation, strategy). A third approach for identifying multidimensional types of engagement in learning represents the self-determination theory on student engagement by Reeve (2012). According to this theory, engagement "refers to the extent of a student's active involvement in a learning activity" and is divided into "behavioral engagement" (based on concentration, attention, effort), "emotional engagement" (with the presence of task-facilitating emotions and the absence of task-withdrawing emotions), "cognitive engagement" (with the usage of sophisticated rather than superficial learning strategies), and "agentic engagement" (about to enrich the learning experience rather to just passively receive it). A fourth multidimensional approach on a conceptual "framework of engagement, antecedents, and consequences" comes from Kahu (2013). In this general approach, engagement has been assumed to build on "affect" (enthusiasm, interest, belonging), "cognition" (deep learning, self-regulation), and "behavior" (time and effort, interaction, participation).

Having these different approaches clearly shows that the dimensions of student engagement are defined in various ways with many terminological overlaps. In order to find exclusive and exhaustive dimensions, a relational definition of cognition, motivation, and emotion from Kuhl (1986) has been considered:
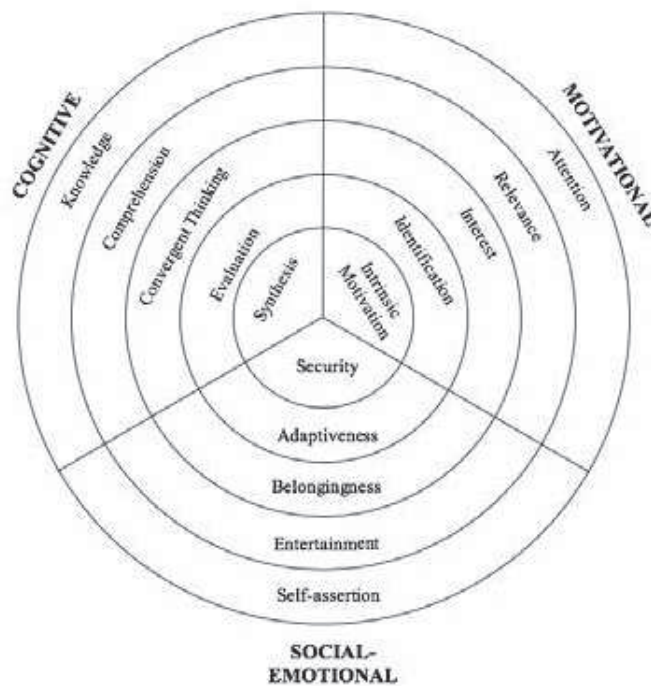
Figure 1. Multidimensional Engagement-levels in Learning.

It is assumed that cognitive, emotional, and motivational subsystems relate to the world in three different ways. The term cognition is reserved for those processes that mediate the acquisition and representation of knowledge about the world, i.e., processes that have a representative relation to the world of objects and facts. Emotional (affective) processes evaluate the personal significance of those objects and facts. Motivational processes related to the world in an actional way, e.g., they relate to goal states of the organism in its attempt to produce desired changed in its environment. (p. 407)

However, the definition by Kuhl (1986) does not help to handle social aspects within emotional and other dimensions of student engagement. Therefore, a definition of social-emotional learning by Zins and Elias (2007) is considered. According to this definition, social-emotional learning is to "recognize and manage emotions, developing caring and concern for others, making responsible decisions, establishing positive relationships and handling challenging situations capably" (p. 234).

Based on these approaches and definitions, it was concluded that three different types of engagement should be at the center of the instructional design approach: cognitive, motivational, and social-emotional engagement (see Figure 1).

Elements of Learning

All types of engagement are related to different elements of learning. Such elements are lessons (i.e., instructional units embedded within learning materials) that support learning in different ways and on different levels within the classroom. They are generated by teachers, instructional designers, and/or students, and consist of (sections of) textbooks, work sheets, single or sets of tasks, examples, statements, hints, guidelines, online resources, and so on. These elements can refer to persons, objects, concepts, ideas, principles, and other entities. They can be used in different instructional contexts and are compatible with approaches on, for example, "knowledge objects" (Merrill, 1999), "re-usable learning objects" (Sicilia & Garcia, 2003), or "instructional elements" (Martin, Klein, & Sullivan, 2007).

Cognitive Engagement

Cognitive engagement concerns the complexity of information processes and products during the acquisition of knowledge and skills. Complexity

ranges from simple (e.g., remembering facts) to sophisticated (e.g., solving problems). This definition does not consider aspects of invested effort or efficiency, because it is difficult in nonlaboratory situations, like daily instruction in the classroom, to have a reliable and valid assessment of microanalytic processes that are associated with cognitive effort or load (Feldon, 2007). It is also true that strategies to encourage cognitive engagement are often based on more macroanalytic behavioral data from students (e.g., Taylor, Pearson, Peterson, & Rodriguez, 2003).

As a next step, a hierarchy of information processes and products has to be established. In doing so, it is productive to consider taxonomies of cognitive outcomes of learning, because they represent hierarchically organized levels of cognitive complexity (Kim, Patel, Uchizono, & Beck, 2012; Overbaugh & Lin, 2006; Phillips, Smith, & Straus, 2013). Each lower level represents (with a certain probability) the precondition for achieving the next higher level. Within the current literature can be found the SOLO taxonomy (with pre-, uni-, multistructural, relational, and extended abstract response structure; Biggs & Collis, 1989), a revision of Bloom's taxonomy (with a knowledge and a cognitive process dimension; Krathwohl, 2002), a new taxonomy (based on levels of processing and domains of knowledge; Marzano & Kendall, 2008), or the ICAP-framework (interactive, constructive, active, and passive modes of engagement; Chi & Wylie, 2014). The SOLO taxonomy requires a complex and highly demanding assessment that reduces applicability in instructional settings (Chick, 1998). The new taxonomy is not exclusively cognitive as it integrates noncognitive elements like examining motivation and emotional response (Marzano & Kendall, 2008, p. 4). The ICAP-framework has not yet been examined comprehensively in ecological classroom studies (Wiggins, Eddy, Grunspan, & Crowe, 2017).

By far the most attention in research and in daily classroom instruction has been given to Bloom's taxonomy (with levels of knowing, understanding, applying, analyzing, synthesizing, and evaluating; Dettmer, 2005). However, validation attempts of this taxonomy have produced mixed and inconclusive results. For example, Madaus, Woods, and Nuttall (1973) have found a strong relationship between the applying and analyzing levels. Roberts (1976) has evaluated the applying-level as especially difficult for test development. Hill and McGaw (1981) have suggested eliminating the knowing-level. Solman and Rosen (1986) have distinguished only two levels, one knowing to analyzing and one combining synthesizing and evaluating. Raters in the study from Van Hoeij, Haarhuis, Wierstra, and van Beukelen (2004) have reached low reliability (ranging from 34% to 77%) and had difficulties in delimiting the understanding from the application level. Martin, Sexton, and Franklin (2005) have combined question categories and the Bloom taxonomy into four levels: "cognitive memory" (knowledge and comprehension), "convergent thinking" (application and analysis), "divergent thinking" (synthesis), and "evaluative thinking" (evaluation). Bearing such problems in mind, Näsström (2009) suggested relating Bloom's taxonomy to educational standards in view of teachers and experts and Eliasson, Karslsson, and Sørensen (2017) have stressed the necessity of focusing on different types of learning supporting questions. Putting all these results and assumptions together into one hierarchical model of cognitive engagement suggests combining the revised Bloom taxonomy by Krathwohl (2002) with some of the question categories by Martin, Sexton, and Franklin (2005) in a way that the following hierarchically organized levels of cognitive engagement (from low to high) can be distinguished:

- Knowledge: retrieving elements of learning from memory (such as recognizing, listing, describing);
- Comprehension: determining the meaning of elements of learning (such as summarizing, explaining, classifying);
- Convergent thinking: solving problems on elements of learning by the application of procedures (such as analyzing, applying, using);
- Evaluation: making judgments on elements of learning based on criteria and standards (such as finding mistakes, criticizing, defending); and
- Synthesis: developing new ideas or products in relation to elements of learning (such as hypothesizing, planning, designing).

Motivational Engagement

Motivational engagement is about the depth of stimulation for actively dealing with information processes and products during the acquisition of knowledge and skills. Depth of stimulation ranges from (low) external (e.g., based on attentional cues) to (high) internal (e.g., based on personal interest). It has repeatedly been found that learning is stimulated differently by external (more distal) factors in comparison to internal (more proximal) factors and mechanisms (Cerasoli, Nicklin, & Ford, 2014; Vallerand & Bissonnette, 1992). Recent approaches on external to internal levels of motivational engagement come from Ryan and Deci (2000), Hidi and Renninger (2006), or Casimiro (2016). There are other hierarchically organized models of motivation that have not been considered here. For example, the hierarchical model of Vallerand and Lalande (2011) is organized on global, contextual, and situational levels, but not on levels from external to internal. The same is true for Maslow's hierarchy of needs model (Benson & Dundis, 2003) or for flow (Chan & Ahern, 1999).

Based on the approach of Ryan and Deci (2000), motivational engagement can be described as ranging from no motivation (lacking an intention to act), external regulation (satisfying an external demand), introjection (internal regulation under external pressure), identification (identifying personal importance), integration (regulating fully assimilated to the self), to intrinsic motivation (inherently interesting or enjoyable). Hidi and Renninger (2006) have distinguished between triggered situational interest (sparked by environmental features), maintained situational interest (with focused attention and persistence), emerging individual interest (beginning to seek repeated reengagement), and well-developed individual interest (relatively enduring predisposition to reengagement). The approach by Casimiro (2016) is originally on cognitive engagement, but it has a clear motivational orientation with the levels of lurking (zero or minimal engagement), praising (expressing simple agreement), connecting (with attempts to respond), extending (responding and asking), expanding (adding new ideas), and emancipating (exercising critical thinking and personal convictions).

Again, as in the case of cognitive engagement, there is only a small conceptual match between the different approaches. Levels of (low to high) motivational engagement that cover many of these concepts are:

· Attention: focusing consciousness selectively on elements of learning (as being alerted);
· Relevance: establishing personal significance with elements of learning (as being involved);
· Interest: voluntarily intending to reengage over time with elements of learning (as being attracted);
· Identification: positively valuing and constantly pursuing goals that are related to elements of learning (as being committed); and
· Intrinsic motivation: deeply engaging for its own sake with elements of learning (as being satisfied).

Social-Emotional Engagement

Social-emotional engagement refers to the emotional attachment to elements of learning during the acquisition of knowledge and skills. Social-emotional attachment ranges from distant (without closeness) to near (with closeness) (e.g., Bergin & Bergin, 2009). Social-emotional aspects in the classroom are covered by traditional approaches to noncognitive learning dealing with self-education, affective education, emotional intelligence, and similar concepts (e.g., Bichelmeyer, Marken, Harris, Misanchuk, & Hixon, 2009). It is also important to stress that there are well-established approaches to social-emotional aspects in classrooms from, for example, Pekrun (2006, 2016), or Gläser-Zikuda, Fuß, Laukenmann, Metz, and Randler (2005). These approaches have not been considered because they do not have a hierarchical developmental organization within their concepts.

However, there are other models that are more relevant here. Traditional models of social-emotional attachment, like the one from Bartholomew and Horowitz (1991), have focused on attachment styles that can also be seen as hierarchically organized stages ranging from dismissing, fearful, preoccupied, to secure relationships. Also, hierarchical structures can be discovered within approaches to love as an important type of attachment. Within the kinds of love outlined by Sternberg (1986), there are

Table 1. Instructional Strategies for Fostering Multidimensional Engagement

Levels	Goals	General Strategies in Elements of Learning
Cognitive Engagement		
Knowledge	Stimulating rehearsal/repetition and encoding	-Repeat knowledge to be learned in intervals -Use memory aids
Comprehension	Making thinking explicit and visible	-Think aloud -Use visual representations
Convergent thinking	Varying task-contexts	-Make tasks the core elements of instruction -Diversify tasks
Evaluation	Promoting critical-analytic thinking	-Stimulate multiperspective reasoning -Cultivate standard-based knowledge revision
Synthesis	Supporting divergent thinking/idea generation	-Assist in theory building -Foster system-thinking
Motivational Engagement		
Attention	Allowing choice-making and classroom structuring	-Permit to select/modify task assignments -Use activity schedules
Relevance	Generating utility value and multiple perspectives	-Communicate and self-generate utility value information -Strive for multiple goals
Interest	Being cool and dynamic	-Use popular topics -Use changing topics
Identification	Stimulating mastery orientation and positivity	-Focus on individual progress -Increase booster thoughts and behaviors
Intrinsic motivation	Enhancing fantasy and curiosity	-Establish game-like activities -Stimulate discovery learning
Social-emotional Engagement		
Self-assertion	Considering prosocial contexts	-Foster identity building -Balance power
Entertainment	Covering enjoyment and emotional needs	-Offer sensations -Include moving experiences
Belongingness	Promoting acceptance and commitment	-Emphasize similarities and complementarities -Include service learning activities
Adaptiveness	Practicing mindfulness	-Forcing perspective recognition -Reducing prejudice and stereotyping
Security	Establishing nonthreatening atmospheres	-Striving for secure attachment -Building resilience

different levels of love ranging from nonlove to consummate love (based on combinations of the three parameters of intimacy, passion, and commitment). Also, a close relationship between attachment and sensitivity with others has been found: According to a model of intercultural sensitivity by Bennett (1986), social-emotional engagement can analogously be described as different levels of experiences from denial (others are ignored), defense (others are stereotyped), minimization (others are equal), acceptance (others are evaluated positively), adaptation (world is seen in the eyes of others), up to integration (views of others are included in own views). Attachment has also played a major role in involvement with sports and the related psychological continuum model by Funk and James (2001). According to this model, engagement develops from awareness (about knowledge and realization of participation opportunities), attraction (based on affective association and attitude formation), attachment (with assigning meaning), to allegiance (based on loyalty). Boekaerts, de Koning, and Vedder (2006) have presented a taxonomy of human goals referring to relations between persons and environments and to affective goals. Such (more or less hierarchically organized) goals can be related to levels of social-emotional engagement and attachment. There are "integrative social relationship goals" (like belongingness, social responsibility, equity, resource provision), "self-assertive goals" (like individuality, self-determination, superiority, resource acquisition), and "affective goals" (like entertainment, tranquility, happiness, bodily sensations, physiological well-being).

Again, there are many theoretical models that only deliver an inconsistent basis for establishing different levels of social-emotional engagement. Another problem is that our approach is primarily on elements of learning (e.g., materials) but not persons (e.g., teachers or students) in the classroom. This restriction has been made because both cognitive and motivational engagement are related to elements of learning and not to persons. Taking these models and this restriction into account, the following levels of social-emotional engagement (from low to high) are distinguished:

- Self-assertion: experiencing feelings of freedom, autonomy, or self-determination in relation to elements of learning (such as

being self-directed);
- Entertainment: experiencing feelings of joy, fun, happiness, or bodily sensations in relation to elements of learning (such as being amused);
- Belongingness: experiencing feelings of community or closeness in relation to elements of learning (such as being attached);
- Adaptiveness: experiencing feelings of sensibility or empathy in relation elements of learning (such as being sensitive); and
- Security: experiencing feelings of harmony, predictability, or mastery in relation elements of learning (such as being safe).

MULTIDIMENSIONAL ENGAGEMENT AND INSTRUCTIONAL STRATEGIES

In this section, for each level of cognitive, motivational, and social-emotional engagement, effective instructional strategies are postulated (see Table 1). Again, these strategies are gained from a review of the literature with a focus on aggregated and integrated research findings. It also has to be noted that instructional strategies do not work equally well for different people in different situations.

Instructional Strategies and an Implementation Program

Instructional strategies are widely used in Instructional Science and represent general prescriptive guidelines about how to design effective instruction. They have to be adapted to specific instructional contexts and the varying needs of learners (Gargiulo & Bouck, 2018). Instructional strategies are general in nature and users must find out by themselves which types of strategies work best in their particular instructional setting. The effects of instructional strategies depend on the quality of the implementation stages, starting with problem exploration and planning, intervention, evaluation, and calibration (e.g., Halle, Metz, & Martinez-Beck, 2013). Instructional strategies also can be used by learners in cases of self-instructing or self-regulating learning.

Practical Examples.

All instructional strategies that are presented in this paper are focused on elements of learning (i.e., learning materials for lessons or instructional units)

and not on persons. Many illustrative examples on how instructional strategies are implemented in lessons or instructional units can be found, for example, in Reigeluth (1987), Willis & Willis (2007), or Astleitner (2017)

LEVELS AND INSTRUCTIONAL STRATEGIES ON COGNITIVE ENGAGEMENT

Knowledge Level and Instructional Strategies on Rehearsal/repetition and Encoding

A starting point and first level of cognitive engagement is when learners dispose of basic knowledge (e.g., facts or definitions) in their long-term memory about the subject matter to be learned. Such knowledge is essential for an advanced cognitive engagement as learners cannot realize deeper engagement without memorized knowledge. Vocabulary learning is a central area of teaching-learning research and instructional practice that is traditionally closely related to knowledge memorization (Schmitt, 2008). In general, vocabulary learning strategies help the learner to get lists of words, concepts, definitions, rules etc., into memory structures. Such a support is not only important in language learning but in every subject area in the classroom. Therefore, students should be instructed to apply rehearsal/repetition and encoding strategies for achieving cognitive engagement at a knowledge level (Karpicke & Roediger, 2008; Rowland, 2014).

Instructional strategies on rehearsal/repetition concern the stimulation of iterative cognitive processing with elements of learning as long as they can be remembered from long-term memory. Successful learners need six to even repetitions and they need to use lists with fewer items when knowledge is difficult and repeat shortly after the first encounter and then frequently afterwards in longer intervals (Gu, 2003). Instructional strategies for fostering encoding realize an additional deeper, or elaborated, cognitive processing in order to support knowledge retention. Such strategies are about using memory aids like associations (e.g., attaching keywords), representations (e.g., creating a mental image), auditory information (e.g., remembering sounds), semantic networks (e.g., drawing cognitive maps), or contexts (e.g., telling stories) (e.g., Gu & Johnson, 1996).

Comprehension Level and Instructional Strategies for Making Thinking Explicit and Visible

Comprehension is finding meaning in elements of learning. To have knowledge and a meaning of it represents a step forward in cognitive engaging, as meaning allows the discovery of relationships and deeper structures in learning. Instructional strategies on fostering comprehension in learning cumulate in making teacher's and student's thinking explicit (Furtak & Ruiz-Primo, 2008) and visible (Miller & Calfee, 2004). The general assumption behind fostering explicitness and/or visibility of learning is that it monitors the knowledge acquisition processes, provides feedback to the learner, helps in avoiding or correcting errors, and supports the organization of information.

As instructional strategies for fostering comprehension and making learning explicit and/or visible in classroom, various activities can be used such as thinking aloud, reciprocal teaching, using partial graphic organizers, paraphrasing, Socratic questioning, or making predictions (e.g., Duke & Pearson, 2008; Duke, Pearson, Strachan, & Billman, 2011; Robinson et al., 2006).

Convergent Thinking and Instructional Strategies for Varying Task-contexts

Convergent thinking is solving problems by using procedural knowledge. Problems are embedded in the classroom within tasks. A task is a stimulus (question or problem) that requires an action (answer or solution) based on cognitive processing. In order to analyze and activate the learning potential of tasks, task analysis methods for instructional design have been established (Jonassen, Tessmer, & Hannum, 1999).

Concerning instructional strategies, tasks play a major role in instructional design and related assessment approaches. For example, they are essential elements in "computer-adaptive testing and instruction" (Mosenthal, 1998), problems in "problem-based learning" (Hmelo-Silver, 2004), or "worked examples" (Atkinson, Derry, Renkl, & Wortham, 2000). Recently, Francom (2017) summarized and integrated research on task-centered instruction in which two general instructional strategies can be formulated. A first instructional strategy is about making tasks the core element in instruction. Such a strategy includes, for example, focusing on learning tasks (not on topics), activating task-relevant

prior knowledge, demonstrating/modeling task performance, applying knowledge to perform tasks, and integrating/exploring the application of knowledge to new tasks, options, or ideas. Another instructional strategy is to vary tasks as a major source for supporting learning. Such variations in the design of tasks can be related to the complexity (with low or high task-difficulty), the part-whole aspect (with single or combined elements), the contexts of tasks (with abstract or concrete scenarios), and the amount of support for learning (with few or many learning aids).

Evaluation and Instructional Strategies for Promoting Critical-analytic Thinking

Making judgments, evaluations, and tests of learning is essential for students' achievements (e.g., Adesope, Trevisan, & Sundararajan, 2017; Südkamp, Kaiser, & Möller, 2012). Within instructional settings, students should be stimulated to formatively evaluate learning in order to improve learning outcomes and deepen learning experiences (Mann, Gordon, & MacLeod, 2009). Especially, critical-analytic thinking allows a deep evaluation of experiences we have in the world and in the classroom. According to Byrnes and Dunbar (2014), critical-analytic thinking is metacognitive and reflective, evaluative, skeptical, analytic, unbiased and open-minded, effortful, and based on domain-specific expertise. Critical-analytic thinking is traditionally closely related to constructivist, experiential, discovery-, problem-, or inquiry-based instruction in combination with approaches to guidance related to evidence-based monitoring, assessing, metacognitive controlling, or self-regulating processes (e.g., Kirschner, Sweller, & Clark, 2006).

General instructional strategies that are related to critical-analytic thinking concern fostering relational reasoning. They establish multiperspective relationships among elements of knowledge acquisition and by standard-based knowledge revision (e.g., McMillan, 2013). As a first instructional strategy, multiperspective reasoning can be stimulated by integrating analogies (two domains are interpreted in terms of one another), anomalies (something that does not fit our expectations), antinomies (evaluating what something is by ascertaining what it is not), and antitheses (with elements in oppositional relations to

one another) into learning experiences (Danielson & Sinatra, 2017). As a second general instructional strategy, standards (goals, norms, guidelines etc.) should be applied for knowledge revision activities. Outcomes of learning have to be confronted with standards in order to identify incorrect knowledge or misconceptions. After identification, such knowledge has to be revised in order that successful learning can occur. Knowledge revision is seen as process that produces a gradual reduction or elimination of preexisting misconceptions which requires an "error culture" with co-activation, integration, and competing activation of correct and incorrect knowledge at the same time (Kendeou, Butterfuss, Van Boekel, & O'Brien, 2017).

Synthesis and Instructional Strategies for Fostering Creativity

Synthesis is about creativity and the development of new ideas or products in a more or less structured process. It requires relevance and effectiveness, problematization, existing knowledge, new knowledge, elegance, and vision (e.g., Cropley & Kaufman, 2012). In order to support synthesis in our classrooms, divergent thinking and idea generating activities are essential (e.g., Runco, 2010). For stimulating such activities, numerous instructional techniques, like using expressive activities, formulating hypotheses, brainstorming, imagery, or solution monitoring have been used in the past (e.g., Scott, Leritz, & Mumford, 2004).

A general instructional strategy that integrates many of traditional classroom activities for fostering synthesis is about theory construction or model-building. Jaccard and Jacoby (2010) have presented 26 heuristics for creativity and the generation of ideas, like, for example, conducting thought experiments, analyzing paradoxical incidents, reframing a problem in terms of the opposite, or pushing findings to the extreme. Such heuristics can be accompanied through general guidelines for encouraging creativity in the classroom. They include strategies like integrating materials across subject areas, questioning assumptions constantly, reflecting on ideas from different backgrounds, asking students to find novel relationships with unrelated ideas, or exposing students to the visions or ideas of other people (DeHaan, 2009; Gregory, Hardiman, Yarmolinskaya, Rinne, & Limb, 2013).

However, as contexts of learning become more complex, it is difficult to find new solutions. New solutions must then be embedded within structures or models of existing knowledge. A solution to a problem becomes creative when it expands or redesigns a system of interrelated knowledge elements. Therefore, as a further instructional strategy, fostering skills in system thinking can be suggested. Such skills are about the ability to identify relationships about systems' components, to make generalizations or predictions on systems' behaviors, to understand hidden dimensions, and to recognize the cyclic nature of systems (Assaraf & Orion, 2005). Instructional strategies to foster system-thinking allow students to explore complex systems phenomena, make system's conceptual framework explicit, or test behaviors, predictions, or new elements of systems with social research and other scientific methods (Jacobson & Wilensky, 2006).

LEVELS AND INSTRUCTIONAL STRATEGIES ON MOTIVATIONAL ENGAGEMENT

Attention and Instructional Strategies for Choice-making and Classroom Structuring

Motivation is at the center of various expectancy-value, attribution, social-cognitive, goal orientation, or self-determination theories and is seen as a process in which goal-directed activities are initiated and sustained (Cook & Artino, 2016). A first step in motivating is to gain and sustain the attention of learners which can, within instructional contexts, be done by perceptual arousal (e.g., surprising events), inquiry arousal (e.g., having the learners generate questions), or variability (e.g., varying elements of instruction) (Keller & Kopp, 1987). Recently, meta-analysis revealed that behavioral classroom interventions respective of behavior management techniques have been found to be effective for reducing attention deficits (Fabiano et al., 2009).

Among the relevant techniques, choice-making strategies allow students to manage and sustain attentional capacities (DuPaul & Weylandt, 2006). Such instructional strategies are about permitting the learner to select and modify task assignments regarding themes, goal or difficulty levels, deadlines, supplements, problem-solving methods, team or group members, etc. One attentional problem in the classroom is to start learning; another problem comes from getting students into learning again

when they have dropped out of classroom activities. From research on students with attention-related learning disabilities, it is well known that classroom structuring methods (e.g., visually organized areas) assist students in resuming interrupted learning activities (Ganz, 2007). Here, it has been found that instructional strategies that are based on activity schedules (in the form of, for example, learning plans, time-tables, posters, photographs, drawings, or videos) have supported the self-regulation of behavior and have increased on-task or on-schedule behavior (Lequia, Machalicek, & Rispoli, 2012)

Relevance and Instructional Strategies for Utility and Multiple Perspectives

When students are attentive to the elements of learning, then they have to evaluate these elements as being relevant for them. Relevance is the reason why students should learn. Fostering relevance is a part of Keller's ARCS-model on the motivational design of instruction, and relevance is usually realized when there is familiarity (e.g., concrete language), goal orientation (e.g., statements about the utility of instruction), and motive matching (e.g., teaching strategies that match the motive profiles of students) (Keller & Kopp, 1987). Relevance plays a major role in classroom approaches to personalized instruction, individualized instruction, experiential learning, or style-based instruction, and in the realization of different levels of interaction and thoughtfulness (Jenkins & Keefe, 2001). Concerning motivation and related relevance, instructional strategies range from shallow "fill-in-the-blank" (e.g., using names of pets in tasks), individual topic interests (e.g., by asking students about topics they are interested in), group topic interests (e.g., a majority of students choose issues), to deep utility-value approaches (e.g., students explore by themselves how topics are relevant to their lives) (Walkington & Bernacki, 2014).

An important instructional strategy for fostering relevance concerns teacher-communicated and/or student-self-generated utility-value information (Canning & Harackiewicz, 2015). Teacher-communicated utility value information could, for example, emphasize how elements of learning could be used for everyday tasks and in a future career. Self-generated utility-value information can be based on essays about the relevance of the elements of learning to the academic and nonacademic life

of students. A second general instructional strategy is focusing on multiple goals, because multiple goals might be more motivationally relevant for learners than a single goal. For example, within significant learning approaches, students focus on many different goal areas, reaching from basic knowledge, application, and integration to learning about one's self or about human development (Fink, 2003). Also, Belland, Kim, and Hannafin (2013) have presented several scaffolding strategies that stimulate short-term goals (e.g., embedding peer modeling) or shared goals (e.g., displaying a consensus problem aspect).

Interest and Instructional Strategies for Coolness and Dynamics

Having interest is the next level of motivational engagement and is based on being attracted by elements of learning. Schraw and Lehman (2001) have presented a taxonomy of personal and situational interest development. From this taxonomy, it can be learned that instructional strategies for fostering interest have to use personal triggers (related, for example, to feelings or values) and situational triggers (related, for example, to seductiveness, vividness, or coherence of learning materials). Swarat (2008) found evidence that cool and dynamic dimensions are the most important ones for interesting topics. The cool dimension corresponds with personal triggers, the dynamic dimension with situational triggers. Topics are cool when they are about "things that are deemed popular among friends or peers" and they are dynamic (or active) when they are about "things that have a fast-moving or constantly changing nature" (p. 14).

As instructional strategies for stimulating interest, teachers should use popular and changing topics. Popular topics are affected by subcultures in classrooms. Subcultures have a close relationship to identity building and value priorities about, for example, self-transcendence (e.g., searching for welfare of other people), conservation (e.g., acceptance of traditional cultures), self-enhancement (e.g., demonstrating competence), or openness to change (e.g., independent thought and action) (e.g., Cieciuch, Davidov, & Algesheimer, 2016). Changing topics are ones that are embedded in stories with dynamically changing fantasy or fictional contexts in which it is necessary for students to think of themselves as actors in time such as a detective who is searching for criminals (e.g., Parker & Lepper, 1992). Such dynamic fantasy contexts (e.g., including mythical or unreal characters) stimulate interest and achievement even in the field of abstract mathematical problem solving (e.g., Wiest, 2001).

Identification and Instructional Strategies for Mastery of Goal Orientation and Positivity

Identification is to value elements of learning as central to the self of the learner. Among other instructional strategies (e.g., empowering students or demonstrating usefulness), it was found that students will value elements of learning on their level of success in handling those elements (Osborne & Jones, 2011).

One sophisticated instructional strategy that is closely related to success in learning contains a mastery goal orientation with a focus on individual progress (Linnenbrink & Pintrich, 2002). In order to foster such an orientation, instructional strategies should (a) offer a variety of tasks with a good chance for success and learning support, (b) use feedback based on the abilities of students and on their individual improvements, (c) reward effort, improvements, and accomplishments, (d) allow to complete assignments at appropriate rates, (e) make evaluations private, or (f) stimulate students to take control for their learning (e.g., Meece, Anderman, & Anderman, 2006). Even when there are success- and progress-orientated instructional strategies within the elements of learning, failures of students and related negativity cannot be avoided. Therefore, it is important to ask how much success is needed in order to buffer the impact of failures. In social interaction research, it was found that a focus on positive aspects should be much higher (at least twice as high) than on negative aspects (Zemp, Merrilees, & Bodenmann, 2014). Within elements of learning, positivity can be stimulated by increasing booster (instead of guzzler) thoughts and behaviors. Booster thoughts and behaviors are about a supporting environment with a positive self-belief, a clear learning focus, a high value of schooling, a need for persistence, a use of planning and monitoring, and a structured study management (Martin, 2010).

Intrinsic Motivation and Instructional Strategies for Fantasy and Curiosity

To be intrinsically motivated represents the final level of motivational engagement in instructional settings. Students are intrinsically motivated when they engage with elements of learning for their own sake (Covington, 2000). Intrinsic motivation has a multifaceted nature with complex relations to different motives and/or feelings, like autonomy, pleasure, or fun (Reiss, 2004). Within the classroom context, it has been found that the same instructional strategies (e.g., praise or choice) reduce, enhance, or have no significant effect on intrinsic motivation (Henderlong & Lepper, 2002; Patall, Cooper, & Robinson, 2008). Frameworks for intrinsically motivating instruction have emphasized goal areas like challenge, fantasy, and curiosity (Malone, 1981), or flow (Chan & Ahern, 1999).

One instructional strategy that is related to all of these goal areas is establishing game-like activities. Such activities are voluntary, enjoyable, separate from the real world, uncertain, unproductive, and based on rules (e.g., Garris, Ahlers, & Driskell, 2002). Game-like activities can be realized in daily instruction by integrating domain-specific learning into given games (Ke, 2016) or by playful learning with opportunities to take risks, experiment, or be creative (Moll, 2011). A second general instructional strategy is curiosity-based guided discovery learning, which "occurs whenever the learner is not provided with the target information or conceptual understanding and must find it independently and with only the provided materials" (p. 2) and when the learner is assisted/guided by feedback, worked examples, scaffolding, or elicited explanations (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011). Such learning is based on continuing challenges that are balanced with given student skills (e.g., Engeser & Rheinberg, 2008; Fong, Zaleski, & Leach, 2015) in order to find optimal learning moments in which students experience high level learning (Schneider et al., 2016).

LEVELS AND INSTRUCTIONAL STRATEGIES OF SOCIAL-EMOTIONAL ENGAGEMENT

Self-assertion and Instructional Strategies for Prosocial Contexts

To increase students' self-assertion requires the consideration of prosocial contexts in elements of learning that allow students to perceive themselves as individuals and as important elements in a community. Prosocial contexts are based on healthy social relationships, effective classroom management, and social-emotional learning (Jennings & Greenberg, 2009). Within a prosocial context, the identities of individual students as well as the social climate are supported by instructional strategies.

Fostering identity building within instructional contexts can be based on incorporating role models or professionals (e.g., physicists or chemists) within elements of learning together with related activities, objectives, audiences, or communication practices (e.g., Dannels, 2000). These activities can be accompanied by a cultivation of the whole or facets of the personality of the student so they are dedicating not only to academics but also to a range of developmental domains (physical, moral, spiritual, aesthetic, etc.) (Rich & Schachter, 2012). A further instructional strategy assumes that self-assertion needs a balanced social context within learning elements. Such a social context needs to focus on balancing power, which can be supported by democratic learning opportunities in which intellectual freedom, participative decision making, cooperative problem-solving, and contributing to community life are essential (e.g., Angell, 1991). Self-assertion is also about self-control and self-consciousness that needs to stimulate rules for positive social behaviors (e.g., Bergin & Bergin, 1999).

Entertainment and Instructional Strategies for Enjoyment and Emotional Needs

Self-assertion allows students to find a stable basis for experiencing the world. With the first cautious steps in the world, such experiences are voluntary and casual: They focus on facile entertainment and related enjoyment coming from episodes of emotional gratifications related to serenity, laugher, suspense, tenderness, sensory delight, self-efficacy, and so on (e.g., Tan, 2008). However, entertainment is also related to a broader and deeper context of individual emotional needs like contemplative emotional experiences, emotional engagement with characters, or social sharing of emotions (Bartsch, 2012).

As an instructional strategy, entertaining of students can be fostered by incorporating a healthy and not overloaded sensation seeking in elements of learning that covers thrills and adventures.

Sensations are based on features like complexity, intensity, uncertainty, or incongruity, and they can be found in books, television, film, music, and outdoor or indoor activities (Zuckerman, 2006). Entertainment also includes experiences that are deeply moving. For elements of learning, an instructional strategy should include moving experiences, such as eliciting scenarios (e.g., critical life experiences or exposure to artworks) that are compatible with prosocial norms and action oriented (e.g., promoting social bonds) that affect one's feelings (e.g., well-being) (Menninghaus et al., 2015). Such moving experiences also allow different types of involvements: tactical (e.g., decision making), affective (e.g., enjoying pretty landscapes), narrative (e.g., storytelling), shared (e.g., competing against others), performative (e.g., executing plans), and spatial (e.g., exploring unknown areas) (Calleja, 2007).

Belongingness and Instructional Strategies for Acceptance and Commitment

Belongingness is about building relationships with elements of learning. A major factor in building relationships is the positive evaluation of such elements in the classroom's or other norms (e.g., Gifford-Smith & Brownell, 2003). Where there is a positive evaluation, acceptance and respect arise together with a broader and longer-term perspective in the relationship. However, these relationships are unstable because they are permanently affected by situational and personal influences. In order that a relationship can be sustained or deepened over time, commitment is essential (e.g., Branje, Frijns, Finkenauer, Engels, & Meeus, 2007). Commitment in relationships depends, in general, on a complex interaction of high satisfaction, high investment, and low quality of alternatives (e.g., Impett, Beals, & Peplau, 2001).

Instructional strategies for promoting\ acceptance and respect should emphasize similarities (e.g., common characteristics) and complementarities (e.g., supplementary characteristics) of persons, objects, concepts, ideas etc. within elements of learning (e.g., Güroğlu, Van Lieshout, Haselager, & Scholte, 2007). Similar and complementary characteristics concern values, preferences, attitudes, and behaviors. In classrooms, fostering commitment as an instructional strategy is often an important element in civic education.

In order to support civic education and continued commitment, service learning, a combination of community-based experiences and classroom reflections, has been applied (e.g., Galston, 2001). Service learning can be included in different subject areas and related elements of learning (e.g., outdoor classrooms in environmental education) and engage students in community services with real partners, problems, intervention programs, and so on. (e.g., Warren, 2012).

Adaptiveness and Instructional Strategies for Mindfulness

In order to enhance social-emotional involvement, an element of learning has to become a part of one's social-emotional experience. This can be done by adapting elements of learning in a mindful way. Mindfulness in the classroom implies that learning objects are unique elements in life and interacting with them needs undivided and careful attention (e.g., Albrecht, Albrecht, & Cohen, 2012). Mindfulness in the classroom can be stimulated by training or therapies (e.g., meditation), but also, more importantly, by teaching mindfully as a general instructional strategy (Zenner, Herrnleben-Kurz, & Walach, 2014).

A first general instructional strategy for increasing mindfulness is stimulating the recognition of other perspectives in elements of learning. This means that students learn that other people have other values, attitudes, or beliefs, and that this is normal and makes sense in that experiences must be explained by considering contexts that have multiple perspectives or models of understanding and that one's own perspective depends on others (Brooks, 2011). Such learning can be realized by writing brief biographies and then role playing the characters the students developed (Poorman, 2002). A deeper social-emotional involvement is often hindered or prevented by untrue or diffuse myths, or stereotypes (gender, cultural, and so on). Therefore, a second general instructional strategy is to reduce prejudice and stereotyping in elements of learning. Such a strategy should be based on incorporating experiences with relevant groups where intergroup relationships should be based on cooperative interdependence, acquaintance potential, equal status, and support for positive interactions (Molina & Wittig, 2006).

Security and Instructional Strategies for a

Table 2. Measuring Multidimensional Engagement in Learning

Levels	The student	Never Rarely Sometimes Often Very frequently
Knowledge	can retrieve contents from memory	0————1————2————3————4
Comprehension	can summarize, explain, or classify contents	0————1————2————3————4
Convergent thinking	can solve problems by the application of learned procedures	0————1————2————3————4
Evaluation	can find mistakes, criticize, or defend contents based on standards	0————1————2————3————4
Synthesis	can develop new ideas, plan projects, or design products	0————1————2————3————4
Attention	efficaciously concentrates on contents	0————1————2————3————4
Relevance	regards contents as personally important	0————1————2————3————4
Interest	re-engages voluntarily and repeatedly with contents	0————1————2————3————4
Identification	is committed to goals that are related to contents	0————1————2————3————4
Intrinsic motivation	engages with contents for their own sake with high satisfaction	0————1————2————3————4
Self-assertion	experiences feelings of freedom or autonomy in learning	0————1————2————3————4
Entertainment	finds joy, fun, or happiness in learning	0————1————2————3————4
Belongingness	feels community or loyalty in learning	0————1————2————3————4
Adaptiveness	is sensible or empathic in relation to elements of learning	0————1————2————3————4
Security	feels secure or sheltered in learning	0————1————2————3————4

Overall student engagement in learning: very low 0–12, low: 13–24, moderate: 25–36, high: 37–48, very high: 49–60

Nonthreatening Atmospheres

Students feel secure in social-emotional classroom settings when they experience a nonthreatening atmosphere in respect to elements of learning. This is the case when students are not threatened nor do not feel threatened by crime, drug use, violence, peer aggression, bullying, or disrespectful behavior (e.g., Cornell & Mayer, 2010). For each of these problems, comprehensive and time-consuming security programs (e.g., anti-bullying trainings) can be implemented in classroom contexts (e.g., Della Cioppa, O'Neil, & Craig, 2015). However, it is also helpful to consider more preventive general instructional strategies.

A first instructional strategy for fostering security is striving for secure attachment when dealing with elements of learning. Secure attachment is fostered by stimulating a warm, promptly responding, coherent, positive, open, and engaged interaction; by helping others to cope with problems; by asserting autonomy; and by integrating and compromising conflict management strategies (Bergin & Bergin, 2009; Morris-Rothschild & Brassard, 2006). Even when secure attachments are stimulated, it is highly probable that students will get hurt in some way and they will need to recover from failures or injuries. For re-establishing security, instructional strategies for fostering resilience in elements of learning are supportive. Resilience can be fostered by stimulating coping activities, such as changing the interpretations of consequences of failures, viewing problems and mistakes as opportunities for learning, or seeking help (Skinner & Pitzer, 2012).

IMPLEMENTING MULTIDIMENSIONAL ENGAGEMENT IN LEARNING

Having an instructional design model for fostering multidimensional engagement allows teachers to plan, conduct, and evaluate elements of learning (i.e., learning materials for lessons or instructional units) and related teaching and learning. Implementing such a model in daily instruction requires the consideration of personal and situational parameters (e.g., existing levels of engagement and the attractiveness of issues). Based on an analysis of these parameters, it has to be decided which instructional strategies should be applied. In general, new or additional instructional strategies can produce cognitive overload, so it is recommended to implement these strategies

Table 3. Measuring Instructional Strategies for Multidimensional Engagement of Students

Levels	Elements of Learning	Never Rarely Sometimes Often Very frequently
Knowledge	urge students to repeatedly memorize contents	0————1————2————3————4
Comprehension	make thinking on contents explicit or visible	0————1————2————3————4
Convergent thinking	use tasks with varying contexts or difficulties for utilizing contents	0————1————2————3————4
Evaluation	stimulate students to critically assess contents based on standards	0————1————2————3————4
Synthesis	support the generation of new ideas or products on contents	0————1————2————3————4
Attention	provide a clear structure or allow choice-making during learning	0————1————2————3————4
Relevance	illustrate the utility values or multiple perspectives for contents	0————1————2————3————4
Interest	combine contents with popular or up-to-date topics	0————1————2————3————4
Identification	focus on individual progress or mastery	0————1————2————3————4
Intrinsic motivation	use game- or discovery-based learning activities	0————1————2————3————4
Self-assertion	foster individual identity building or power balancing	0————1————2————3————4
Entertainment	include sensations or moving experiences in learning	0————1————2————3————4
Belongingness	emphasize similarities between learners or promotes service learning	0————1————2————3————4
Adaptiveness	practice mindfulness towards people or contents	0————1————2————3————4
Security	establish a nonthreatening atmosphere for attachment or resilience	0————1————2————3————4

Overall instructional activities for multidimensional engagement of students: very low 0–12, low: 13–24, moderate: 25–36, high: 37–48, very high: 49–60

in small steps. It has also to be considered that implementing instructional strategies can reduce the stability of effects on engagement and learning as there are side and interaction effects. Also, the same instructional strategies can have positive and at the same time negative effects. These common difficulties can be handled by establishing instructional monitoring and decision making (related to a goal- and evidence-based diagnose-implement-diagnose-adapt-cycles) (e.g., Stecker, Lembke, & Foegen, 2008): Teachers, instructional designers, and learners diagnose the engagement levels and compare them with the given goals, implement instructional strategies into elements of learning to increase these levels, test the effects of the implementation, and, finally, calibrate the implementation. This process is repeated until the intended goals are achieved.

In order to support such a diagnose-implement-diagnose-process cycle, teachers, instructional designers, and learners need measurement instruments. One part of such instruments should allow measuring the level of students' multidimensional engagements in learning. In Table 2, a preliminary version of such an instrument

(without having yet tested dimensionality, reliability, and validity) is depicted. For each dimension and for each level of engagement, one item is formulated that has to be evaluated on a five-point-rating scale. Then, answers on all 15 items can be combined in order to get the overall student engagement in learning ranging from very low to very high.

Student engagement levels are assumed to be affected by instructional strategies within elements of learning. Within Table 3, first and not yet tested items for measuring such instructional strategies are outlined. Again, these items are related to the instructional design approach of multidimensional engagement in learning and can be used for measuring student engagement. Measuring here means to rate elements of learning (e.g., learning materials) on how intense instructional strategies have been implemented into these elements. Before rating, the units of analysis have to be settled. These units correspond with the different types of elements of learning (e.g., learning materials for a whole lesson, sections of textbooks, or task-sets).

DISCUSSION

In this paper, an instructional design approach

for multidimensional engagement in learning has been presented. Within this approach, major research findings on cognitive, motivational, and social-emotional engagement in learning have been reviewed and integrated on a common and conclusive basis. Based on this approach, instructional strategies for elements of learning have been suggested and related measurement instruments have been developed. The instructional strategies have been formulated in a general manner that allows them to be used in elements of learning within different social or organizational settings (e.g., working in groups or self-study). They can be used by researchers, teachers, and instructional designers, but also by learners who want to increase their engagement in learning by themselves.

Of course, future research activities will have to test whether this approach is effective and efficient in daily instruction. Elements of learning in which the presented instructional strategies have been implemented must be tested comprehensively in comparison with elements of learning without such instructional strategies. Recent examples of studies in which different types of elements of learning (i.e., instructional texts) have been tested can be found, for example, in Mills, D'Mello, & Kopp (2015) or Dutke, Grefe, & Leopold (2016). At the moment, it is not clear how much of an instructional strategy will lead to a maximum of engagement in learning. It might be hypothesized that not a maximum, but more a medium, amount of an instructional strategy might produce the most positive effects (e.g., Salehi, Cordero & Sandi, 2010). It is also an open question how many cognitive, emotional, and social-emotional dimensions of engagement should be activated by instructional strategies at the same time, because it is well known that, for example, social-emotional engagement might facilitate or suppress learning (e.g., Knörzer, Brünken, & Park, 2016). Also, the measurement instruments presented will have to be evaluated on their measurement quality. Concerning the measurement options, these scales could then also be related to given measurements of student engagements (e.g., Fredricks & McColskey, 2012).

REFERENCES

Adesope, O. O., Trevisan, D. A., & Sundararajan, N. (2017). Rethinking the use of tests: A meta-analysis of practice testing. *Review of Educational Research, 87*, 659–701. doi:10.3102/0034654316689306

Albrecht, N., Albrecht, P., & Cohen, M. (2012). Mindfully teaching in the classroom: A literature review. *Australian Journal of Teacher Education, 37*, 1–14. doi:10.14221/ajte.2012v37n12.2

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology, 103*, 1–18. doi:10.1037/a0021017

Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., Rothstein, H. R., & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries: A meta-analytic review. *Psychological Bulletin, 136*, 151–173. doi:10.1037/a0018251

Angell, A. V. (1991). Democratic climates in elementary classrooms: A review of theory and research. *Theory & Research in Social Education, 19*, 241–263. doi:10.1080/0093 3104.1991.10505640

Assaraf, O. B.-Z., & Orion, N. (2005). Development of system thinking skills in the context of earth system education. *Journal of Research in Science Teaching, 42*, 518–560. doi:10.1002/ tea.20061

Atkinson, R. K., Derry, S. J., Renkl, A., & Wortham, D. (2000). Learning from examples: Instructional principles from the worked examples research. *Review of Educational Research, 70*, 181–214. doi:10.3102/00346543070002181

Aubteen Darabi, A., Nelson, D. W., & Paas, F. (2007). Learner involvement in instruction on a complex cognitive task: Application of a composite measure of performance and mental effort. *Journal of Research on Technology in Education, 40*, 39–48. doi:10.1080/15391523.2007.10782495

Baeten, M., Kyndt, E., Struyven, K., & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review, 5*, 243–260. doi:10.1016/j.edurev.2010.06.001

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61*, 226–244. doi:10.1037/0022-3514.61.2.226

Bartsch, A. (2012). Emotional gratification in entertainment experience. Why viewers of movies and television series find it rewarding to experience emotions. *Media Psychology, 15*, 267–302. doi:10.1080/15213269.2012.693811

Baumeister, R. F., & Leary, M. R. (1997). Writing narrative literature reviews. *Review of General Psychology, 1*, 311–320. doi:10.1037/1089-2680.1.3.311

Belland, B. R., Kim, C., & Hannafin, M. J. (2013). A framework for designing scaffolds that improve motivation and cognition. *Educational Psychologist, 48*, 243–270. doi:10.1080/0046152 0.2013.838920

Bennett, M. J. (1986). A developmental approach to training for intercultural sensitivity. International *Journal of Intercultural Relations, 10*, 179–196. doi:10.1016/0147-1767(86)90005-2

Benson, S. G., & Dundis, S. P. (2003). Understanding and motivating health care employees: Integrating Maslow's hierarchy of needs, training and technology. *Journal of Nursing Management, 11*, 35–320. doi:10.1046/j.1365-2834.2003.00409.x

Bergin, C., & Bergin, D. A. (1999). Classroom discipline that promotes self-control. *Journal of Applied Developmental Psychology, 20*, 189–206. doi:10.1016/S0193-3973(99)00013-1

Bergin, C., & Bergin, D. A. (2009). Attachment in classroom. *Educational Psychology Review, 21*, 141–170. doi:10.1007/ s10648-009-9104-0

Bichelmeyer, B. A., Marken, J., Harris, T., Misanchuk, M., & Hixon, E. (2009). Fostering affective development outcomes: Emotional intelligence. In C. M. Reigeluth & A. A. Carr-Chellman (Eds.), *Instructional-design theories and models: Building a common knowledge base* (Vol. III)(pp. 249–273). New York, NY: Routledge.

Biggs, J., & Collis, K. (1989). Towards a model of school-based curriculum development and assessment using the SOLO taxonomy. *Australian Journal of Education, 33*, 151–163. doi:10.1177/168781408903300205

Boekaerts, M. (2016). Engagement as an inherent aspect of the learning process. *Learning and Instruction, 43*, 76–83. doi:10.1016/j.learninstruc.2016.02.001

Boekaerts, M., de Koning, E., & Vedder, P. (2006). Goal-directed behavior and contextual factors in the classroom: An innovative approach to the study of multiple goals. *Educational Psychologist, 41*, 33–51. doi:10.1207/s15326985ep4101_5

Branje, S. J., Frijns, T. O. M., Finkenauer, C., Engels, R., & Meeus, W. I. M. (2007). You are my best friend: Commitment and stability in adolescents' same-sex friendships. *Personal Relationships, 14*, 587–603. doi:10.1111/j.1475-6811.2007.00173.x

Brooks, S. (2011). Historical empathy as perspective recognition and care in one secondary social studies classroom. *Theory & Research in Social Education, 39*, 166–202. doi:10.1080/00933104.2011.10473452

Burt, K. B., Obradović, J., Long, J. D., & Masten, A. S. (2008). The interplay of social competence and psychopathology over 20 years: Testing transactional and cascade models. *Child Development, 79*, 359–374. doi:10.1111/j.1467-8624.2007.01130.x

Byrnes, J. P., & Dunbar, K. N. (2014). The nature and development of critical-analytic thinking. *Educational Psychology Review, 26*, 477–493. doi:10.1007/s10648-014-9284-0

Calleja, G. (2007). Digital game involvement: A conceptual model. *Games and Culture, 2*, 236–260. doi:10.1177/1555412007306206

Canning, E. A., & Harackiewicz, J. M. (2015). Teach it, don't preach it: The differential effects of directly-communicated and self-generated utility-value information. *Motivation Science, 1*, 47–71. doi:10.1037/mot0000015

Casimiro, L. T. (2016). Cognitive engagement in online intercultural interactions: Beyond analytics. International Journal of Information and Education Technology, 6, 441–447. Retrieved from https://www.researchgate.net/profile/Leni_Casimiro/publication/273694509_Cognitive_Engagement_in_Online_Intercultural_Interactions_Beyond_Analytics/links/5508ced90cf2d7a2812b1b98.pdf

Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin, 140*, 980–1008. doi:10.1037/a0035661

Chan, T. S., & Ahern, T. C. (1999). Targeting motivation—Adapting flow theory to instructional design. *Journal of Educational Computing Research, 21*, 151–163. doi:10.2190/UJ04-T5YB-YFXE-0BG2

Chi, M. T. H., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist, 49*, 219–243. doi:10.1080/00461520.2014.965823

Chick, H. (1998). Cognition in the formal modes: Research mathematics and the SOLO taxonomy. *Mathematics Education Research Journal, 10*, 4–26. doi:10.1007/BF03217340

Christenson, S. L., Reschly, A. L., & Wylie, C. (Eds.). (2012). *Handbook of research on student engagement.* New York, NY: Springer.

Cieciuch, J., Davidov, E., & Algesheimer, R. (2016). The stability and change of value structure and priorities in childhood: A longitudinal study. *Social Development, 25*, 503–527. doi:10.1111/sode.12147

Connor, C. M., Piasta, S. B., Fishman, B., Glasney, S., Schatschneider, C., Crowe, E., Underwood, P., & Morrison, F. J. (2009). Individualizing student instruction precisely: Effects of child by instruction interactions on first graders' literacy development. *Child Development, 80*, 77–100. doi:10.1111/j.1467-8624.2008.01247.x

Cook, D. A., & Artino Jr. A. R. (2016). Motivation to learn: An overview of contemporary theories. *Medical Education, 50*, 997–1014. doi:10.1111/medu.13074

Cornell, D. G., & Mayer, M. J. (2010). Why do school order and safety matter? *Educational Researcher, 39*, 7–15. doi:10.3102/0013189X09357616

Covington, M. V. (2000). Intrinsic versus extrinsic motivation in schools: A reconciliation. *Current Directions in Psychological Science, 9*, 22–25. doi:10.1111/1467-8721.00052

Cropley, D. H., & Kaufman, J. C. (2012). Measuring functional creativity: Non‐expert raters and the Creative Solution Diagnosis Scale. *The Journal of Creative Behavior, 46*, 119–137. doi:10.1002/jocb.9

Csikszentmihalyi, M., & Wolfe, R. (2014). New conceptions and research approaches to creativity: Implications of a systems perspective for creativity in education. In M. Csikszentmihalyi (Ed.), *The systems model of creativity* (pp. 161–184). Dordrecht, Netherlands: Springer.

Danielson, R. W., & Sinatra, G. M. (2017). A relational reasoning approach to text-graphic processing. *Educational Psychology Review, 29*, 55–72. doi:10.1007/s10648-016-9374-2

Dannels, D. P. (2000). Learning to be professional: Technical classroom discourse, practice, and professional identity construction. J*ournal of Business and Technical Communication, 14*, 5–37. doi:10.1177/105065190001400101

DeHaan, R. L. (2009). Teaching creativity and inventive problem solving in science. *CBE-Life Sciences Education, 8*, 172–181. doi:10.1187/cbe.08-12-0081

Della Cioppa, V., O'Neil, A., & Craig, W. (2015). Learning from traditional bullying interventions: A review of research on cyberbullying and best practice. *Aggression and Violent Behavior, 23*, 61–68. doi:10.1016/j.avb.2015.05.009

Dettmer, P. (2005). New blooms in established fields: Four domains of learning and doing. *Roeper Review, 28*, 70–78. doi:10.1080/02783190609554341

Dicke, T., Parker, P. D., Marsh, H. W., Kunter, M., Schmeck, A., & Leutner, D. (2014). Self-efficacy in classroom management, classroom disturbances, and emotional exhaustion: A moderated mediation analysis of teacher candidates. *Journal of Educational Psychology, 106*, 569–583. doi:10.1037/a0035504

Dindar, M., & Akbulut, Y. (2016). Effects of multitasking on retention and topic interest. *Learning and Instruction, 41*, 94–105. doi:10.1016/j.learninstruc.2015.10.005

Doyle, W. (2006). Ecological approaches to classroom management. In C. M. Evertson & C. S. Weinstein (Eds.), *Handbook of classroom management: Research, practice, and contemporary issues* (pp. 97–125). New York, NY: Routledge.

Duke, N. K., & Pearson, P. D. (2008). Effective practices for developing reading comprehension. *The Journal of Education, 189*, 107–122. doi:10.1177/0022057409189001-208

Duke, N., Pearson, P. D., Strachan, S., & Billman, A. (2011). Essential elements of fostering and teaching reading comprehension. In S. J. Samuels & A. E. Farstrup (Eds.), *What research has to say about reading instruction* (4th ed.) (pp. 51–93). Newark, DE: International Reading Association.

Dunne, E., & Owen, D. (Eds.). (2013). *The student engagement handbook: Practice in higher education.* Bingley, UK: Emerald.

DuPaul, G. J., & Weyandt, L. L. (2006). School-based intervention for children with attention deficit hyperactivity disorder: Effects on academic, social, and behavioural functioning. *International Journal of Disability, Development and Education, 53*, 161–176. doi:10.1080/10349120600716141

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*, 405–432. doi:10.1111/j.1467-8624.2010.01564.x

Dutke, S., Grefe, A. C., & Leopold, C. (2016). Learning from scientific texts: Personalizing the text increases transfer performance and task involvement. *European Journal of Psychology of Education, 31*, 499–513. doi:10.1007/s10212-015-0281-6

Dutton, E., & Lynn, R. (2015). A negative Flynn Effect in France, 1999 to 2008-9. *Intelligence, 51*, 67–70. doi:10.1016/j.inte11.2015.05.005

Eliasson, N., Karlsson, K. G., & Sørensen, H. (2017). The role of questions in the science classroom—How girls and boys respond to teachers' questions. *International Journal of Science Education, 39*, 433–452. doi:10.1080/09500693.2017.1289420

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218–232. doi:10.1037/0022-3514.72.1.218

Engeser, S., & Rheinberg, F. (2008). Flow, performance and moderators of challenge-skill balance. *Motivation and Emotion, 32*, 158–172. doi:10.1007/s11031-008-9102-4

Fabiano, G. A., Pelham, W. E., Coles, E. K., Gnagy, E. M., Chronis-Tuscano, A., & O'Connor, B. C. (2009). A meta-analysis of behavioral treatments for attention-deficit/hyperactivity disorder. Clinical Psychology Review, 29, 129–140. doi:10.1016/j.cpr.2008.11.001

Feldman, D. H. (2004). Piaget's stages: The unfinished symphony of cognitive development. *New Ideas in Psychology, 22*, 175–231. doi:10.1016/j.newideapsych.2004.11.005

Feldon, D. F. (2007). Cognitive load and classroom teaching: The double-edged sword of automaticity. *Educational Psychologist, 42*, 123–137. doi:10.1080/00461520701416173

Fink, L. D. (2003). Creating significant learning experiences: An integrated approach to designing college courses. San Francisco, CA: Jossey-Bass.

Fong, C. J., Zaleski, D. J., & Leach, J. K. (2015). The challenge-skill balance and antecedents of flow: A meta-analytic investigation. *The Journal of Positive Psychology, 10*, 425–446. doi:10.1080/17439760.2014.967799

Francom, G. M. (2017). Principles for task-centered instruction. In C. M. Reigeluth, B. J. Beatty, & R. D. Myers (Eds.), *Instructional-design theories and models. The learner-centered paradigm of education* (Vol. IV)(pp. 65–91). New York, NY: Routledge.

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: A comparative analysis of various methods and student self-report instruments. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 763–782). New York, NY: Springer.

Funk, D. C., & James, J. (2001). The psychological continuum model: A conceptual framework for understanding an individual's psychological connection to sport. *Sport Management Review, 4*, 119–150. doi:10.1016/S1441-3523(01)70072-1

Furlong, M. J., Whipple, A. D., Jean, G. S., Simental, J., Soliz, A., & Punthuna, S. (2003). Multiple contexts of school engagement: Moving toward a unifying framework for educational research and practice. *The California School Psychologist, 8*, 99–113. doi:10.1007/BF03340899

Furtak, E. M., & Ruiz‐Primo, M. A. (2008). Making students' thinking explicit in writing and discussion: An analysis of formative assessment prompts. *Science Education, 92*, 799–824. doi:10.1002/sce.20270

Galston, W. A. (2001). Political knowledge, political engagement, and civic education. *Annual Review of Political Science, 4*, 217–234. doi:10.1146/annurev.polisci.4.1.217

Ganz, J. B. (2007). Classroom structuring methods and strategies for children and youth with autism spectrum disorders. *Exceptionality, 15*, 249–260. doi:10.1080/09362830701655816

Gargiulo, R. M., & Bouck, E. C. (Eds.). (2018). *Instructional strategies for students with mild, moderate, and severe intellectual disability.* Thousand Oaks, CA: Sage.

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & Gaming, 33*, 441–467. doi:10.1177/1046878102238607

Gettinger, M., & Walter, M. J. (2012). Classroom strategies to enhance academic engaged time. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 653–673). New York, NY: Springer.

Gibbs, G. (2013). Reflections on the changing nature of educational development. *International Journal for Academic Development*, 18, 4–14. doi:10.1080/1360144X.2013.751691

Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: Social acceptance, friendships, and peer networks. *Journal of School Psychology, 41*, 235–284. doi:10.1016/S0022-4405(03)00048-7

Gläser-Zikuda, M., Fuß, S., Laukenmann, M., Metz, K., & Randler, C. (2005). Promoting students' emotions and achievement—Instructional design and evaluation of the ECOLE-approach. *Learning and Instruction, 15*, 481–495. doi:10.1016/j.learninstruc.2005.07.013

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal, 26*, 91–108. doi:10.1111/j.1471-1842.2009.00848.x

Gregory, E., Hardiman, M., Yarmolinskaya, J., Rinne, L., & Limb, C. (2013). Building creative thinking in the classroom: From research to practice. *International Journal of Educational Research, 62*, 43–50. doi:10.1016/j.ijer.2013.06.003

Gu, P. Y. (2003). Vocabulary learning in a second language: Person, task, context and strategies. *The Electronic Journal for English as a Second Language, 7*, 1–25. Retrieved from http://www.tesl-ej.org/wordpress/issues/volume7/ej26/ej26a4

Gu, P. Y., & Johnson, R. K. (1996). Vocabulary learning strategies and language learning outcomes. *Language Learning, 46*, 643–679. doi:10.1111/j.1467-1770.1996.tb01355.x

Guralnick, M. J. (1992). A hierarchical model for understanding children's peer-related social competence. In S. L. Odom, S. R. McConnell, & M. A. McEvoy (Eds.), *Social competence of young children with disabilities: Issues and strategies for intervention* (pp. 37–64). Baltimore, MD: Brookes.

Güroğlu, B., Van Lieshout, C. F., Haselager, G. J., & Scholte, R. H. (2007). Similarity and complementarity of behavioral profiles of friendship types and types of friends: Friendships and psychosocial adjustment. *Journal of Research on Adolescence, 17*, 357–386. doi:10.1111/j.1532-7795.2007.00526.x

Guthrie, J. T., Wigfield, A., & You, W. (2012). Instructional contexts for engagement and achievement in reading. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 601–634). New York, NY: Springer.

Halle, T., Metz, A., & Martinez-Beck, I. (Eds.). (2013). *Applying implementation science in early childhood programs and systems.* Baltimore, MD: Brookes.

Harbour, K. E., Evanovich, L. L., Sweigart, C. A., & Hughes, L. E. (2015). A brief review of effective teaching practices that maximize student engagement. *Preventing School Failure: Alternative Education for Children and Youth, 59*, 5–13. doi:10.1080/1045988X.2014.919136

Henderlong, J., & Lepper, M. R. (2002). The effects of praise on children's intrinsic motivation: A review and synthesis. *Psychological Bulletin, 128*, 774–795. doi:10.1037/0033-2909.128.5.774

Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*, 111–127. doi:10.1207/s15326985ep4102_4

Hill, P. W., & McGaw, B. (1981). Testing the simplex assumption underlying Bloom's taxonomy. *American Educational Research Journal, 18*, 93–101. doi:10.3102/00028312018001093

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*, 235–266. doi:10.1023/B:EDPR.0000034022.16470.f3

Impett, E. A., Beals, K. P., & Peplau, L. A. (2001). Testing the investment model of relationship commitment and stability in a longitudinal study of married couples. *Current Psychology, 20*, 312–326. doi:10.1007/s12144-001-1014-3

Jaccard, J., & Jacoby, J. (2010). *Theory construction and model-building skills. A practical guide for social scientists.* New York, NY: Guilford Press.

Jacobson, M. J., & Wilensky, U. (2006). Complex systems in education: Scientific and educational importance and implications for the learning sciences. *The Journal of the Learning Sciences, 15*, 11–34. doi:10.1207/s15327809jls1501_4

Jenkins, J. M., & Keefe, J. W. (2001). Strategies for personalizing instruction: A typology for improving teaching and learning. *NASSP Bulletin, 85*, 72–82. doi:10.1177/019263650108562908

Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research, 79*, 491–525. doi:10.3102/0034654308325693

Jonassen, D. H., Tessmer, M., & Hannum, W. H. (1999). T*ask analysis methods for instructional design.* Mahwah, NJ: Erlbaum.

Kahu, E. R. (2013). Framing student engagement in higher education. *Studies in Higher Education, 38*, 758–773. doi:10.1080/03075079.2011.598505

Karpicke, J. D., & Roediger, H. L. III (2008). The critical importance of retrieval for learning. *Science, 319*, 966–968. doi:10.1126/science.1152408

Ke, F. (2016). Designing and integrating purposeful learning in game play: A systematic review. *Educational Technology Research and Development, 64*, 219–244. doi:10.1007/s11423-015-9418-1

Keller, J. M. (2010). *Motivational design for learning and performance. The ARCS model approach.* New York, NY: Springer.

Keller, J. M., & Kopp, T. W. (1987). An application of the ARCS model of motivational design. In C. M. Reigeluth (Ed.), *Instructional theories in action. Lessons illustrating selected theories and models* (pp. 289–320). Hillsdale, NJ: Erlbaum.

Kendeou, P., Butterfuss, R., Van Boekel, M., & O'Brien, E. J. (2017). Integrating relational reasoning and knowledge revision during reading. *Educational Psychology Review, 29*, 27–39. doi:10.1007/s10648-016-9381-3

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education, 29*, 76–85. doi:10.1016/j.tate.2012.08.005

Kim, M.-K., Patel, R. A., Uchizono, J. A., & Beck, L. (2012). Incorporation of Bloom's taxonomy into multiple-choice examination questions for a Pharmacotherapeutics course. *American Journal of Pharmaceutical Education, 76*, 114. doi:10.5688/ajpe766114

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist, 41*, 75–86. doi:10.1207/s15326985ep4102_1

Knörzer, L., Brünken, R., & Park, B. (2016). Facilitators or suppressors: Effects of experimentally induced emotions on multimedia learning. *Learning and Instruction, 44*, 97–107. doi:10.1016/j.learninstruc.2016.04.002

Ko, C. H., Yen, J. Y., Yen, C. F., Chen, C. S., & Chen, C. C. (2012). The association between Internet addiction and psychiatric disorder: A review of the literature. *European Psychiatry, 27*, 1–8. doi:10.1016/j.eurpsy.2010.04.011

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An Overview. *Theory into Practice, 41*, 212–218. doi:10.1207/s15430421tip4104_2

Kuhl, J. (1986). Motivation and information processing: A new look at decision making, dynamic change and action control. In R. M. Sorrentino & E. T. Higgins (Eds.), *The handbook of motivation and cognition: Foundations of social behavior* (pp. 404–434). New York, NY: Guilford.

Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems: A meta-analytic review. *Review of Educational Research, 86*, 42–78. doi:10.3102/0034654315581420

Lawson, M. A., & Lawson, H. A. (2013). New conceptual frameworks for student engagement research, policy, and practice. *Review of Educational Research, 83*, 432–479. doi:10.3102/0034654313480891

Lequia, J., Machalicek, W., & Rispoli, M. J. (2012). Effects of activity schedules on challenging behavior exhibited in children with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 6*, 480–492. doi:10.1016/j.rasd.2011.07.008

Leutner, D., Fleischer, J., Grünkorn, J., & Klieme, E. (Eds.). (2017). *Competence assessment in education. Research, models and instruments.* Cham, Switzerland: Springer.

Linnenbrink, E. A., & Pintrich, P. R. (2002). Motivation as an enabler for academic success. *School Psychology Review, 31*, 313–327.

Lyddy, F., Farina, F., Hanney, J., Farrell, L., & O'Neill, N. K. (2014). An analysis of language in university students' text messages. *Journal of Computer-Mediated Communication, 19*, 546–561. doi:10.1111/jcc4.12045

Madaus, G. F., Woods, E. M., & Nuttall, R. L. (1973). A causal model analysis of Bloom's taxonomy. *American Educational Research Journal, 10*, 253–262. doi:10.3102/00028312010004253

Malone, T. W. (1981). Toward a theory of intrinsically motivating instruction. *Cognitive Science, 4*, 333–369. doi:10.1016/S0364-0213(81)80017-1

Mann, K., Gordon, J., & MacLeod, A. (2009). Reflection and reflective practice in health professions education: A systematic review. *Advances in Health Sciences Education, 14*, 595–621. doi:10.1007/s10459-007-9090-2

Marsh, H. W. (1990). A multidimensional, hierarchical model of self-concept: Theoretical and empirical justification. *Educational Psychology Review, 2*, 77–172. doi:10.1007/BF01322177

Martin, A. (2010). *Building classroom success: Eliminating academic fear and failure.* London, UK: Continuum.

Martin, F., Klein, J. D., & Sullivan, H. (2007). The impact of instructional elements in computer-based instruction. British *Journal of Educational Technology, 38*, 623–636. doi:10.1111/j.1467-8535.2006.00670.x

Martin, R., Sexton, C., & Franklin, T. (2005). *Teaching science for all children: An inquiry approach* (4th ed.). Boston, MA: Allyn & Bacon.

Marzano, R. J., & Kendall, J. S. (2008). *Designing & assessing educational objectives. Applying the new taxonomy.* Thousand Oaks, CA: Corwin Press.

McCormick A.C., Kinzie J., & Gonyea R. M. (2013). Student engagement: Bridging research and practice to improve the quality of undergraduate education. In M. Paulsen (Ed.), *Higher Education: Handbook of theory and research* (Vol. 28) (pp. 47–92). Dordrecht, Netherlands: Springer.

McMillan, J. H. (Ed.). (2013). *SAGE Handbook of research on classroom assessment.* Thousand Oaks, CA: Sage.

Meece, J. L., Anderman, E. M., & Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology, 57*, 487–503. doi:10.1146/annurev.psych.56.091103.070258

Menninghaus, W., Wagner, V., Hanich, J., Wassiliwizky, E., Kuehnast, M., & Jacobsen, T. (2015). Towards a psychological construct of being moved. *PloS one, 10*(6), e0128451. doi:10.1371/journal.pone.0128451

Merrill, M. D. (1999). Instructional Transaction Theory (ITT): Instructional design based on knowledge objects. In C. M. Reigeluth (Ed.), *Instructional-design theories and models* (Vol. II)(pp. 397–424). Mahwah, NJ: Erlbaum.

Merrill, M. D. (2007). A task-centered instructional strategy. Journal of Research on Technology in Education, 40, 5–22. doi:10.1080/15391523.2007.10782493

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis. An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Miller, R. G., & Calfee, R. C. (2004). Making thinking visible. *Science and Children, 42*, 20–25.

Mills, C., D'Mello, S. K., & Kopp, K. (2015). The influence of consequence value and text difficulty on affect, attention, and learning while reading instructional texts. *Learning and Instruction, 40*, 9–20. doi:10.1016/j.learninstruc.2015.07.003

Molina, L. E., & Wittig, M. A. (2006). Relative importance of contact conditions in explaining prejudice reduction in a classroom context: Separate and equal? *Journal of Social Issues, 62*, 489–509. doi:10.1111/j.1540-4560.2006.00470.x

Moll, R. F. (2011). Affective learning in playful learning environments: Physics outreach challenges. *Children Youth and Environments, 21*, 256–270. Retrieved from http://www.jstor.org/stable/10.7721/chilyoutenvi.21.2.0256

Morris-Rothschild, B. K., & Brassard, M. R. (2006). Teachers' conflict management styles: The role of attachment styles and classroom management efficacy. *Journal of School Psychology, 44*, 105–121. doi:10.1016/j.jsp.2006.01.004

Mosenthal, P. B. (1998). Defining prose task characteristics for use in computer-adaptive testing and instruction. *American Educational Research Journal, 35*, 269–307. doi:10.3102/00028312035002269

Näsström, G. (2009). Interpretation of standards with Bloom's revised taxonomy: A comparison of teachers and assessment experts. *International Journal of Research & Method in Education, 32*, 39–51. doi:10.1080/17437270902749262

Osborne, J. W., & Jones, B. D. (2011). Identification with academics and motivation to achieve in school: How the structure of the self influences academic outcomes. *Educational Psychology Review, 23*, 131–158. doi:10.1007/s10648-011-9151-1

Overbaugh, R. C., & Lin, S. (2006). Student characteristics, sense of community, and cognitive achievement in web-based and lab-based learning environments. *Journal of Research on Technology in Education, 39*, 205–223. doi:10.1080/15391523.2006.10782480

Owens, E. W., Behun, R. J., Manning, J. C., & Reid, R. C. (2012). The impact of Internet pornography on adolescents: A review of the research. *Sexual Addiction & Compulsivity, 19*, 99–122. doi:10.1080/10720162.2012.660431

Parker, L. E., & Lepper, M. R. (1992). Effects of fantasy contexts on children's learning and motivation: Making learning more fun. *Journal of Personality and Social Psychology, 62*, 625–633. doi:10.1037/0022-3514.62.4.625

Patall, E. A., Cooper, H., & Robinson, J. C. (2008). The effects of choice on intrinsic motivation and related outcomes: A meta-analysis of research findings. *Psychological Bulletin, 134*, 270–300. doi:10.1037/0033-2909.134.2.270

Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review, 18*, 315–341. doi:10.1007/s10648-006-9029-9

Pekrun, R. (2016). Academic emotions. In K. R. Wetzel & D. B. Miele (Eds.), *Handbook of motivation at school* (2nd ed.)(pp. 120–144). New York, NY: Routledge.

Phillips, A. W., Smith, S. G., & Straus, C. M. (2013). Driving deeper learning by assessment: An adaptation of the revised Bloom's taxonomy for medical imaging in gross anatomy. *Academic Radiology, 20*, 784–789. doi:10.1016/j.acra.2013.02.001

Poorman, P. B. (2002). Biography and role playing: Fostering empathy in abnormal psychology. *Teaching of Psychology, 29*, 32–36. doi:10.1207/S15328023TOP2901_08

Prot, S., & Gentile, D. A. (2014). Applying risk and resilience models to predicting the effects of media violence on development. *Advances in Child Development and Behavior, 46*, 215–244. doi:10.1016/B978-0-12-800285-8.00008-X

Reeve J. (2012). A self-determination theory perspective on student engagement. In S. Christenson, A. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149–172). Boston, MA: Springer.

Reigeluth, C. M. (Ed.). (1987). *Instructional theories in action. Lessons illustrating selected theories and models.* Hillsdale, NJ: Erlbaum.

Reigeluth, C. M., & An, Y.-J. (2009). Theory building. In C. M. Reigeluth & A. A. Carr-Chellman (Eds.), *Instructional-design theories and models. Building a common knowledge base* (Vol. III)(pp. 365–386). New York, NY: Routledge.

Reigeluth, C. M., & Carr-Chellman, A. A. (2009). Understanding instructional theory. In C. M. Reigeluth & A. A. Carr-Chellman (Eds.), *Instructional-design theories and models. Building a common knowledge base* (Vol. III)(pp. 3–26). New York, NY: Routledge.

Reinke, W. M., Stormont, M., Herman, K. C., Puri, R., & Goel, N. (2011). Supporting children's mental health in schools: Teacher perceptions of needs, roles, and barriers. *School Psychology Quarterly, 26*, 1–13. doi:10.1037/a0022714

Reiss, S. (2004). Multifaceted nature of intrinsic motivation: The theory of 16 basic desires. *Review of General Psychology, 8*, 179–193. doi:10.1037/1089-2680.8.3.179

Rich, Y., & Schachter, E. P. (2012). High school identity climate and student identity development. *Contemporary Educational Psychology, 37*, 218–228. doi:10.1016/j.cedpsych.2011.06.002

Rindermann, H., Becker, D., & Coyle, T. R. (2017). Survey of expert opinion on intelligence: The Flynn effect and the future of intelligence. *Personality and Individual Differences, 106*, 242–247. doi:10.1016/j.paid.2016.10.061

Roberts, N. (1976). Further verification of Bloom's taxonomy. The *Journal of Experimental Education, 45*, 16–19. doi:10.1080/00220973.1976.11011556

Robinson, D. H., Katayama, A. D., Beth, A., Odom, S., Hsieh, Y. P., & Vanderveen, A. (2006). Increasing text comprehension and graphic note taking using a partial graphic organizer. *The Journal of Educational Research, 100*, 103–111. doi:10.3200/JOER.100.2.103-111

Rowland, C. A. (2014). The effect of testing versus restudy on retention: A meta-analytic review of the testing effect. *Psychological Bulletin, 140*, 1432–1463. doi:10.1037/a0037559

Runco, M. A. (2010). Divergent thinking, creativity, and ideation. In J. C. Kaufman & R. J. Sternberg (Eds.), *The Cambridge handbook of creativity* (pp. 413–446). Cambridge, UK: University Press.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54–67. doi:10.1006/ceps.1999.1020

Salehi, B., Cordero, M. I., & Sandi, C. (2010). Learning under stress: The inverted-U-shape function revisited. *Learning & Memory, 17*, 522–530. doi:10.1101/lm.1914110

Schmitt, N. (2008). Instructed second language vocabulary learning. *Language Teaching Research, 12*, 329–363. doi:10.1177/1362168808089921

Schneider, B., Krajcik, J., Lavonen, J., Salmela‐Aro, K., Broda, M., Spicer, J., Bruner, J., Moeller, J., Linnansaari, J., Juuti, K., & Viljaranta, J. (2016). Investigating optimal learning moments in US and Finnish science classes. *Journal of Research in Science Teaching, 53*, 400–421. doi:10.1002/tea.21306

Schraw, G., & Lehman, S. (2001). Situational interest: A review of the literature and directions for future research. *Educational Psychology Review, 13*, 23–52. doi:10.1023/A:1009004801455

Schuitema, J., Dam, G. T., & Veugelers, W. (2008). Teaching strategies for moral education: A review. *Journal of Curriculum Studies, 40*, 69–89. doi:10.1080/00220270701294210

Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal, 16*, 361–388. doi:10.1080/10400410409534549

Shernoff, D. J., Kelly, S., Tonks, S. M., Anderson, B., Cavanagh, R. F., Sinha, S., & Abdi, B. (2016). Student engagement as a function of environmental complexity in high school classrooms. *Learning and Instruction, 43,* 52–60. doi:10.1016/j.learninstruc.2015.12.003

Sibley, E., Theodorakakis, M., Walsh, M. E., Foley, C., Petrie, J., & Raczek, A. (2017). The impact of comprehensive student support on teachers: Knowledge of the whole child, classroom practice, and teacher support. *Teaching and Teacher Education, 65*, 145–156. doi:10.1016/j.tate.2017.02.012

Sicilia, M. A., & Garcia, E. (2003). On the concepts of usability and reusability of learning objects. *The International Review of Research in Open and Distributed Learning, 4* (2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/viewArticle/155/236

Sinatra, G. M., Heddy, B. C., & Lombardi, D. (2015). The challenges of defining and measuring student engagement in science. *Educational Psychologist, 50*, 1–13. doi:10.1080/00461520.2014.1002924

Skinner, E. A., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In S. L. Christensen, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 21–44). New York, NY: Springer.

Smit, K., de Brabander, C. J., Boekaerts, M., & Martens, R. L. (2017). The self-regulation of motivation: Motivational strategies as mediator between motivational beliefs and engagement for learning. *International Journal of Educational Research, 82*, 124–134. doi:10.1016/j.ijer.2017.01.006

Solman, R., & Rosen, G. (1986). Bloom's six cognitive levels represent two levels of performance. *Educational Psychology, 6*, 243–263. doi:10.1080/0144341860060303

Squires, J., & Bricker, D. (2007). *An activity-based approach to developing young children's social emotional competence.* Baltimore, MD: Brookes.

Stecker, P. M., Lembke, E. S., & Foegen, A. (2008). Using progress-monitoring data to improve instructional decision making. P*reventing School Failure: Alternative Education for Children and Youth, 52*, 48–58. doi:10.3200/PSFL.52.2.48-58

Sternberg, R. J. (1986). A triangular theory of love. *Psychological Review, 93*, 119–135. doi:10.1037/0033-295X.93.2.119

Südkamp, A., Kaiser, J., & Möller, J. (2012). Accuracy of teachers' judgments of students' academic achievement: A meta-analysis. *Journal of Educational Psychology, 104*, 743–762. doi:10.1037/a0027627

Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education, 94*, 252–275. doi:10.1016/j.compedu.2015.11.008

Swarat, S. (2008). What makes a topic interesting? A conceptual and methodological exploration of the underlying dimensions of topic interest. *Electronic Journal of Science Education, 12*, 1–26. Retrieved from http://ejse.southwestern.edu/article/viewFile/7773/5540

Tan, E. S. H. (2008). Entertainment is emotion: The functional architecture of the entertainment experience. *Media Psychology, 11*, 28–51. doi:10.1080/15213260701853161

Taylor, B. M., Pearson, P. D., Peterson, D. S., & Rodriguez, M. C. (2003). Reading growth in high-poverty classrooms: The influence of teacher practices that encourage cognitive engagement in literacy learning. *The Elementary School Journal, 104*, 3–28. doi:10.1086/499740

Trowler, V. (2010). *Student engagement literature review.* Retrieved from Lancaster University, Department of Educational Research Web site: https://www.heacademy.ac.uk/system/files/studentengagementliteraturereview_1.pdf

Vallerand, R. J., & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study. *Journal of Personality, 60*, 599–620. doi:10.1111/j.1467-6494.1992.tb00922.x

Vallerand, R. J., & Lalande, D. R. (2011). The MPIC model: The perspective of the hierarchical model of intrinsic and extrinsic motivation. Psychological Inquiry: An *International Journal for the Advancement of Psychological Theory, 22*, 45–51. doi:10.1080/1047840X.2011.545366

Van Hoeij, M. J. W., Haarhuis, J. C. M., Wierstra, R. F. A., & van Beukelen, P. (2004). Developing a classification tool based on Bloom's taxonomy to assess the cognitive level of short essay questions. *Journal of Veterinary Medical Education, 31*, 261–267. doi:10.3138/jvme.31.3.261

Van Merriënboer, J. J. G., & Kirschner, P. A. (2012). *Ten steps to complex learning: A systematic approach to four-component instructional design* (2nd ed.). New York, NY: Routledge.

Voorhees, R. A., & Bedard-Voorhees, A. (2017). Principles for competency-based education. In C. M. Reigeluth, B. J. Beatty, & R. D. Myers (Eds.), *Instructional-design theories and models: The learner-centered paradigm of education* (Vol. IV) (pp. 33–63). New York, NY: Routledge.

Walkington, C., & Bernacki, M. L. (2014). Motivating students by "personalizing" learning around individual interests: A consideration of theory, design, and implementation issues. In S. Karabenick & T. Urdan (Eds.), *Advances in motivation and achievement* (Vol. 18)(pp. 139–176). Bingley, UK: Emerald.

Wang, M. T., Willett, J. B., & Eccles, J. S. (2011). The assessment of school engagement: Examining dimensionality and measurement invariance by gender and race/ethnicity. *Journal of School Psychology, 49*, 465–480. doi:10.1016/j.jsp.2011.04.001

Warren, J. L. (2012). Does service-learning increase student learning? A meta-analysis. *Michigan Journal of Community Service Learning, 18*, 56–61. Retrieved from https://eric.ed.gov/?id=EJ988320

Wiest, L. (2001). The role of fantasy contexts in word problems. *Mathematics Education Research Journal, 13*, 74–90. doi:10.1007/BF03217100

Wigelsworth, M., Qualter, P., & Humphrey, N. (2017). Emotional self-efficacy, conduct problems, and academic attainment: Developmental cascade effects in early adolescence. *European Journal of Developmental Psychology, 14*, 172–189. doi:10.1080/17405629.2016.1180971

Wiggins, B. L., Eddy, S. L., Grunspan, D. Z., & Crowe, A. J. (2017). The ICAP active learning framework predicts the learning gains observed in intensely active classroom experiences. *AERA Open, 3*, 1–14. doi:10.1177/2332858417708567

Willis, D., & Willis, J. (2007). *Doing task-based teaching.* Oxford, UK: University Press.

Wlodarczyk, O., Pawils, S., Metzner, F., Kriston, L., Wendt, C., Klasen, F., Ravens-Sieberer, U., & The BELLA Study Group. (2016). Mental health problems among preschoolers in Germany: Results of the BELLA Preschool Study. *Child Psychiatry & Human Development, 47*, 529–538. doi:10.1007/s10578-015-0586-3

Zemp, M., Merrilees, C. E., & Bodenmann, G. (2014). How much positivity is needed to buffer the impact of parental negativity on children? *Family Relations, 63*, 602–615. doi:10.1111/fare.12091

Zenner, C., Herrnleben-Kurz, S., & Walach, H. (2014). Mindfulness-based interventions in schools—A systematic review and meta-analysis. *Frontiers in Psychology, 5*, 603. doi:10.3389/fpsyg.2014.00603

Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action. *Active Learning in Higher Education, 11*, 167–177. doi:10.1177/1469787410379680

Zins, J. E., & Elias, M. J. (2007). Social and emotional learning: Promoting the development of all students. *Journal of Educational and Psychological Consultation, 17*, 233–255. doi:10.1080/10474410701413152

Zuckerman, M. (2006). Sensation seeking in entertainment. In J. Bryand & P. Vorderer (Eds.), *Psychology of entertainment* (pp. 367–387). New York, NY: Routledge.