Chapter 8

ENGAGEMENT AND POSITIVE YOUTH DEVELOPMENT: CREATING OPTIMAL LEARNING ENVIRONMENTS

David J. Shernoff

Studies in the United States have found that more than 25% of all high school students are not engaged in schooling, with upward of 40% to 60% of students characterized as chronically disengaged, including both high and low achievers (Furlong & Christenson, 2008; Klem & Connell, 2004; Marls, 2000; Steenberg, Brown, & Dornbusch, 1996). Adolescents generally report being more dissatisfied with school than with any other area of life, with 9% describing their school experience as "terrible" (Hubbert & Diemer, 2008, p. 300). Furthermore, a consistent finding among numerous studies is the tendency for academic engagement to steadily decline as students progress through the elementary, middle, and high school years (Marks, 2000; National Center for Education Statistics, 2000; Stipek, 2002). In this chapter, I review prevailing literature on the reasons for chronic disengagement, the significance of student engagement, and how it has been studied. I then discuss engagement as conceptualized by theory on flow experiences. Engagement is suggested to be a lens through which to see the extent to which two important educational aims are facilitated: learning and psychological well-being. Next, I report research findings on perceptual and contextual factors influencing engagement and a related conceptual model. Recent research on the immediate impact of instructional practices in public high school classes, including the use of immersive technologies, is then presented. Several alternative models to mainstream public education, with associated research on their effectiveness in engaging youth, are also considered. These alternatives include alternative public schools and organized after-school programs for youth engagement. A conceptualization of optimal learning environments is also presented, and implications for educational philosophy, policy, and practice are discussed.

REASONS FOR PERVERSIVE DISENGAGEMENT: THE STATUS QUO OF SCHOOLING

Students (or school) engagement typically refers to students' involvement with schooling, academics, and learning, and disengagement refers to boredom, disassociation, detachment, or alienation with respect to schooling (e.g., Finn, 1899, 1993; Marks, 2000; Skinner & Belmont, 1993). The 2009 High School Survey of Student Engagement found that two thirds (66%) of students are not engaged or very engaged in high school, and approximately one in six students (17%) are bored in every class (Yazzie-Mintz, 2010).

The research conducted with colleagues reported in this chapter was supported by a variety of funders in grants to multiple investigators. Research on engagement in high school classrooms was supported by a grant from the Alfred P. Sloan Foundation to Charles Nebel, Ashley McArthur, Larry Hodges, and Barbara Schodl. Research on engagement in after-school programs was supported by a grant from the C.S. Mott Foundation to Deborah Lose Vandell, principal investigator. Research on engagement in a video game approach to mechanical engineering education was supported by several grants from the National Science Foundation to Brenton Celley and Davis. Shernoff. Options are those of the authors and not those of the funding agencies. In addition to the principal investigators of these studies and coauthors in articles stemming from them, I wish to thank the many people who assisted in working on these studies, although they are too numerous to mention by name here.
Eighty-one percent of students in the national sample were bored in class because the material was not interesting; 42% felt that the material taught was not relevant to life; 3% were bored because of the lack of interaction with the teacher; and 26% were bored because the work was too difficult. The frequency with which these reasons for boredom were cited were very consistent in both the 2000 and the 2009 administrations of the High School Survey of Student Engagement. Additional reasons for boredom provided in the 2006 report were that students did not feel they were an important part of the school community (45%) and that there were no adults at school who cared about them (22%; Yazzie-Mintz, 2004). In both 2006 and 2009, approximately one in five students (20% in 2006 and 22% in 2009) considered dropping out of high school, and within this group, the three most-cited reasons given were not liking school, not liking the teachers, and not seeing value in their schoolwork. Because the survey is taken by attending students, however, the sample constitutes only a small percentage. More than 1 million (or 3%) of all ninth graders fail to graduate from high school, with the dropout rate approaching 50% to 55% in some large urban centers (Alliance for Excellent Education, 2009; Toppo, 2010). It is important to understand the characteristics of students and schools that most strongly contribute to the current status quo, some of which become apparent from students’ survey responses. For one, 20% of high school students say their disengagement stems from confusion in difficult courses such as math and science. However, a higher percentage—nearly one third of high school students—say they are bored because they are not challenged enough (Yazzie-Mintz, 2007). Second, the benefits of schooling are not immediately evident to students because they purportedly exist some time in the distant future, such that their personal happiness or fulfillment is constantly being deferred (Noddings, 2003). A third distinctive characteristic is that children are frequently told to do their best, but for one fourth to one third of them, their best is clearly not good enough, simply because they represent the bottom end of a perpetual grade distribution. When a sizable proportion of students are made to feel inferior, not only is there a lack of happiness and engagement, but self-esteem also suffers. Thus, a certain measure of unhappiness and disengagement may be actively created by the educational system itself (Glasier, 1975).

Failing to emotionally engage and identify with school can lead to the perception that there is nobody at school who cares, and to a corresponding decline in participation (Voom, 1997). Finn’s (1988) seminal research and identification—participation model suggests that a chronic pattern of tardiness, absenteeism, failing classes, and suspensions characterize a gradual cycle of disengagement (and half of all high school students report patterns of skipping school; Yazzie-Mintz, 2010) that is ultimately expressed by dropping out of school for many youths. This model was supported by high school dropouts in a recent longitudinal study of 11,827 French-Canadian students, which demonstrated that students dropped out when they felt alienated and believed that school did not meet their needs (Aeschburch, Jarosz, Falbo, & Pogami, 2009). When high school students from disadvantaged backgrounds become disengaged in school, they are less likely to graduate from high school, and then they face limited vocational and life opportunities. In fact, fewer than half of ninth graders who enter high school in areas of concentrated urban poverty earn a diploma (National Research Council Institute of Medicine, 2004). Because dropping out of school is often the most visible sign of a gradual cycle of disengagement, the primary theoretical model for understanding school dropout and promoting school completion centers on engagement (Furlong & Christenson, 2008).

The National Research Council’s Institute of Medicine (2004) argued that schools are breeding grounds for alienation because, overall, they do not foster a healthy environment for psychosocial development. There is considerable overlap in characteristics of the U.S. educational system as emphasizing efficiency, monolithic teaching practices, and narrow curricula devoid of meaning to the real lives of students (Boyker, 1983; Darling-Hammond, 1997; Goodlad, 1984; Sizer, 1984). Such a learning environment has resulted in significant proportions of students who are not authentically engaged, either because they do not take schooling seriously (Steinberg et al., 1998) or because they take school too seriously. For this latter group, the value of schooling is reduced to an ambitious competition to gain college admission, satisfy parental expectations, or both, accompanied by symptoms of psychological maladjustment and academic dishonesty (Pope, 2001).

HISTORICAL CONSIDERATION: HOW DID SCHOOLS GET THIS WAY?

According to Tyack’s (1974) account of educational history, public schools in their predominant form were developed in an effort to manage masses of students, modeled after the hierarchical centralization of industrial bureaucracies. As industrialization, demographic shifts, and urbanization altered country life in the early 1900s, according to this account, schooling based on the one-room country schools of the 19th century—which were controlled by the community, were nongraded, and featured unordered instruction, flexible scheduling, and parent-teacher visitations—was transformed into a singular, dominant system of schooling, with the primary aim of teaching vocational skills. A chief distinction of the new schools was that they were designed and led by professionals and controlled by a centralized bureaucracy. City and state superintendents, school board leaders, and other central administrators were impressed by the division of labor at the factories, punctuality of the railroad, and chain of command of businesses, and sought to bring the same order of rapid industrialization to the new graded schools. Thus, the principal influence in shaping the dominant model of schooling, which has proven remarkably resistant to change ever since was the convergence of industrialization and urbanization in the middle decades of the 19th century (Tyack, 1974). The new “one best system” of schooling brought with it several practices that have since become firmly entrenched. For example, the new system included ability levels, records of attendance, and uniform textbooks. Central offices created increasing controls over students, teachers, principals, and other subordinates in the school hierarchy. Perhaps most salient from today’s perspective, uniform written tests provided a single standard by which to measure the output of each school, replacing the more personalized and intuitive written evaluations by teachers based on oral examinations. From nearly the moment they were implemented, the tendency for schoolchildren to answer a low percentage of standardized test questions was used as evidence of failure in entire districts.

Traditional education, as it is sometimes referred to today, was thus mandated. The main reason that bureaucratization gradually replaced the older, decentralized village pattern of schooling was the pressure of large numbers (Tyack, 1974, pp. 38–39). Although educators and critics scorned administrators’ putting organization ahead of education, schooling became an extremely efficient machine through which students passed. The nearly universal design and physical layout of schools used for the batch processing of students has been dubbed the “egg-crate school” (Tyack, 1974; Tyack & Tobin, 1994). Students were divided by their tested proficiency, large numbers of students were put into a single classroom, and these students were to attend the same exact studies at exactly the same time. Division-of-labor efficiency was obtained by focusing the work of a teacher on a single grade (Tyack & Tobin, 1994). Uniform courses were designed to conform to standardized testing, and uniform curricula were created in which teachers were instructed on what questions to ask and what answers to accept. The model was so precise that superintendents in their central office could know, at any given time, what pages of each textbook were being worked on in every school (Tyack, 1974).

AIMS OF EDUCATION

One does not have to get very deep into a discussion about schooling before realizing that it cannot be evaluated or improved without reference to the aims of education. Noddings (2003) argued that as a culture, a discussion of educational aims has been all but abandoned, almost taking for granted the aim of achievement in the early years and the aim of vocational or career utility during later education. Aims of education are of course rooted in societal values and are to some extent morally relative; furthermore, multiple aims of education must coexist in a pluralistic society
and change over time as conditions change. However, John Dewey (1943/1990) famously simplified one guiding precept of educational aims this way: "What the best and wisest parents want for his own child, that must the community want for all of its children. Any other ideal for our schools is narrow and unlovely; acted upon, it destroys our democracy." (p. 5). Huntington (2004:9) and Kohlberg, M. (2001:12) pointed out that the list of things that most parents want for their children include happiness, confidence, balance, health, and kindness—in other words, development, psychological, and emotional well-being. They further asserted that the list almost no overlap with the list of things parents describe schools as actually emphasizing—achievement, success, conformity, and subject content.

Identifying factors leading to the positive development and psychological well-being of youth is the primary goal of research on positive youth development (Larson, 2000; Lenser et al., 2003). A primary tenet of work on positive youth development is not that "every child can achieve," as defined by No Child Left Behind legislation, but that every child has the potential for healthy development. Because positive and engaging experiences are the hallmark of developmental well-being, motivation and sustained engagement have been suggested as key drivers of the common phenomena of students' tendency to forget a great deal of what was mastered for the test only weeks after studying for it. Months later, and certainly years later, often most of the knowledge that was learned seems to have vanished. Just as anyone who has learned a foreign language knows, "use it or lose it" is often the same of the learning game, which is why motivation, and continuing motivation in particular, may be the master key to learning that leads to life achievements or accomplishments valued by society. Albert Einstein (1936/1954) thus believed that the quality of the achievement is determined by the quality of the motivation (see pp. 39-44). The development of certain kinds of motivation would thus appear to be an important aim of education in its own right—motivation is intrinsic, which is what defines itself even in the absence of external incentives and pressures (R. M. Ryan & Deci, 2000).

In sum, both learning and well-being may be considered important aims of education. Engagement may serve as a lens, from students' experiential point of view, through which processes serving both ends can be seen. Thus, engagement is an important construct and valuable outcome in its own right both (a) because it is related to substantive, meaningful learning that carries forward into the future and (b) because engaged experiences also serve the fuel well-being. I will further examine both claims after a brief examination of how engagement has been conceptualized in the context of the research literature.

**RESEARCH AND SCHOLARSHIP ON ENGAGEMENT**

Usually referring to students' involvement with schooling, academics, or learning (e.g., Dunn, 1989, 1993; Markus, 2000; Skinner & Belmont, 1993), engagement is fairly broad that student (or school) engagement involves both behaviors (e.g., completing assignments) and emotions (e.g., belongingness), and encompasses effort and persistence in schoolwork (Connell & Wellborn, 1991; Newman, 1992; Skinner & Belmont, 1993; Smetana, 1990). Student engagement and motivation to learn (Stipek, 2002) are highly related concepts, having more commonalities than differences as measurable constructs. Both motivation and engagement have been conceptualized as personal traits and context-varying psychological constructs (Fredricks, Blumenfeld, & Paris, 2004; Schunk, Pintrich, & Meece, 2008). However, motivation has traditionally been viewed as a psychological construct, whereas engagement, even in its common definition, refers to an emotional involvement or commitment to some object and thus to the experiential intensity of a relationship or interaction. It can refer to sustained engagement as with engagement in the process of schooling or a domain of interest, and also to one's temporal involvement or interaction with activities and social partners in the immediate environment, as with research on youth engagement (Jooleswky, 2007; Toneczews, Jones, & Jooleswky, 2008). Created by the dynamics of the situation or immediate context, engagement in this sense is not dissimilar from the concept of situational interest (Hidi & Anderson, 1992; Mitchell, 1993). An increasing amount of attention is directed toward engagement because it is presumed to be malleable and highly influenced by the learning environment, thus considered a means to ameliorate downward student trajectories. Fredricks et al. (2004) observed that a multitude of conceptualizations and measurements of engagement run throughout the literature and concluded that school engagement should be conceptualized as a multidimensional metaconstruct made up of three distinct but related dimensions: cognitive engagement (i.e., interest in learning, self-regulation), behavioral engagement (i.e., positive conduct, demonstration of effort), and emotional engagement (e.g., interest and boredom).

Engagement and Sustained Involvement in Learning

As a latent metaconstruct, engagement pervades the propensity to learn in the meaningful or lifelong sense. As illustrated by Hidi and Renninger's (2006) four-phase model of interest development, individual episodes of engagement gradually accrue meaning, culminating in a strengthened, sustained, and persistent involvement and commitment in an area of interest (Nakamura, 2001). For example, interest and enjoyment reported at random moments in high school science classes was found to predict the choice of a college major in science 2 years later and was a better predictor of performance in college than grades in high school (Sheriff & Hogstetter, 2001). Similarly, interest in classes once in college was also a predictive of continued study in the same subject area (Hazackiewicz, Barron, Taser, & Elliott, 2002). Findings such as these have suggested that a pattern of momentary engagement may be predictive of long-term continuing motivation, an important but seldom considered educational outcome (Maehr, 1976). Studies of creative and occupational achievement have found that individuals who develop a lifelong commitment with domain, and meaningfully contribute to it, typically have a long history of daily engagement in intrinsically enjoyable, related activities (Csikszentmihalyi, 1996; Nakamura, 2001). Thus, as Csikszentmihalyi and Larson (1988) have suggested, the pattern of engagement one builds in adolescence can have a defining influence on patterns of attention, consciousness, and interest development that carry into adulthood. A great deal of research has perhaps not surprisingly shown that student engagement is positively related to learning and achievement and that disengagement leads to poor academic outcomes in a variety of subjects (Kelly, 2008; Marks, 2000; Srin & Rogers-Sinir, 2004; Voelkl, 1997).

Engagement and Psychological Well-Being

Although the importance of engagement is frequently reduced to its relationship to achievement, research has shown that engagement and well-being have a strong relationship. Students who are interested and involved in skill building and productive pursuits score higher on measures of psychological adjustment, including measures of self-esteem, responsibility, competence, and social relations, whereas youth who report feeling alienated from school are more likely to have a variety of serious psychological and behavioral problems, including withdrawal, depression, aggression, delinquency, drug and alcohol use, and sexual promiscuity.
Specifically (Carl, Delie Faye, & Massimini, 1988; Nakamura, 1988). Flow is thus extremely useful in guiding conceptualization of student engagement. However, flow is conceptually distinct as a heightened state of engagement, and one that occurs in many diverse activity types including athletic and artistic activities. Student or school engagement refers to involvement in the learning or schooling process specifically. Unlike many flow activities, engagement in schoolwork is compulsory, involves significant mental strain, and is often passive because of its cerebral nature (Brophy, 1983). It does not include the type of psychological arousal that accompanies athletes who get psyched up for peak performances or flow experiences.

 Phenomenological Components of Engagement in Learning

Student engagement has been conceptualized phenomenologically, on the basis of flow theory, as the experience of simultaneous, heightened concentration, enjoyment, and interest (Shernoff, Csikszentmihalyi, Schoneder, & Sherhoff, 2003). Because all three components are strongly related to learning (Shernoff & Csikszentmihalyi, 2005), engagement defined in this way is very close to learning itself, or at least to the experience of learning. This conceptualization combines enjoyment typical in voluntary activities with the focused concentration exacted in productive and skill-building activities, culminating in a state of engagement that feels like both work and play. This combination is not only the essential experiential criterion for fostering positive youth development (Larson, 2000), but it may also be the vital experiential condition for learning to occur because although learning is not always enjoyable, it can be. According to cognitive scientist, Willingham (2009), thinking for humans is slow, hard, and effortful, such that conditions have to be just right for thinking or concentration to be pleasurable. For example, a problem must not be overly complicated or contain an unmanageable amount of information, and the correct solution must be perceived as attainable, or most people will give up. At the same time, little pleasure is obtained if the correct answer is simply given. Thus, as has been empirically demonstrated, engagement in learning is activated when the conditions necessary for flow are satisfied, including that the challenge of the task is appropriate for student’s skill level, the goals are clear, and performance feedback is present (Shernoff et al., 2003). On the basis of flow theory, one may regard such episodes as optimal learning experiences.

Because flow is a state of heightened engagement, it may be unrealistic to conceptualize adolescent students as routinely in flow during school; indeed, research has demonstrated that they are not (Shernoff & Csikszentmihalyi, 2009). As stated by the National Research Council (2004), however, the flow model provides an image of engagement that is a useful ideal: “We are not proposing that all high school students be in a constant state of flow, but we have seen youth deeply and enthusiastically engaged in schoolwork and we believe that this high standard should be our goal” (p. 32). That is, deep problem-solving, authentic interest in a topic, and enjoyment in creating works, as encapsulated by the concept of flow, is a useful way to conceptualize ideal engagement in learning.

Measuring Flow and Engagement in Learning

The experience sampling method (ESM; see Hecker, Schmitt, & Csikszentmihalyi, 2007) has been used as an effective instrument to gather direct measures of students’ emotional and cognitive engagement in the moment when engaged in natural or formal learning environments. To carry out the ESM, study participants carry a paging device (usually a programmable wristwatch), which signals them at random moments. Each time participants are signaled, they complete a brief questionnaire on which they answer open-ended and scaled questions about the day and time of the signal, their activities and thoughts, and the cognitive, affective, and motivational qualities of their experience. Items include the following: “If you were beeping, how well were you concentrating?”. “Did you enjoy what you were doing?”. “Was this activity the most interesting?”. A composite of all three of these items reported in learning environments is used to measure student engagement (Shernoff et al., 2003). In addition, participants complete an open-ended item on the content of
their thoughts, which can be used as a measure of student attention in classrooms. These repeated snapshots of subjective experience in the moment address the problem of recall and estimation errors inherent to surveys and interview measures. In addition, capturing repeated measures of engagement over time allows researchers to examine engagement both as a situational state that varies from time instance to another and as a trait that individuals carry forward. Even though engagement is a complex construct influenced by multiple factors (Appleton, Christenson, & Furlong, 2008; Steinberg et al., 1996), studies analyzing ESM measures of engagement with multilevel models have found that only 25% of the variation in student engagement exists between students, potentially explainable by cultural or ethnic, community, peer, or family variables. In contrast, a full 75% of the variation in engagement fluctuates as students move from one situation or learning environment to another, potentially explainable by instructional or other malleable contextual factors (Shernoff, 2010b).

Influences on Engagement in ESM Studies Schools have been observed to contain remarkable degrees of excitement and activity. Hallways, lunch areas, and after-school programs brim with energy; intense interactions characteristic of flow are exhibited during sports and extracurricular and nonacademic activities. However, that is rarely the case in academic classrooms (Shinn & Yoshikawa, 2008). Often, teachers would like to know whether students are paying attention at all, and if not, what they are thinking about. Nationally representative ESM studies of high school students found that students were less engaged in their academic classes than when in other environments outside of school (Shernoff & Csikszentmihalyi, 2009). Measures of attention revealed that students' thoughts were completely unrelated to academics approximately 40% of the time. When not thinking about academics, students were often thinking about their social lives outside of school, outside activities and events, and a variety of inner feelings and sensations. Much as Jackson (1968/1990) observed, even when teachers acted as broadcasting stations, they appeared to be communicating with some students for brief, sporadic periods of time, and the rest of the time students were interacting with other stimuli, both internal and external. Fortunately, the ESM method has been just as useful in identifying factors by which students become more engaged in classrooms.

Perceptual Factors Influencing Engagement Although the general tendency is for students to report low engagement in high school classrooms, a number of perceptual, contextual, and instructional factors can have strong influences on improving engagement (Shernoff et al., 2003). For one, students become significantly more engaged and concentrated much better when challenged. In classrooms, students become more interested, and thus pay better attention, when invited to engage in complex problem solving instead of confronting topics only superficially (Newmann, 1992). Supporting Newmann's (1992) conception of "authentic" curricular and instructional models, classrooms that by a high level of action and emotional energy are no exception (Olictsky, 2007). From the standpoint of engagement, then, optimal learning environments activate perceptions of importance, control, and activity in addition to other conditions for flow experiences such as the appropriate match of challenges to students' skills and clear goals, and timely feedback. These environments were more likely to be encountered in individual and group work formats than the more common instructional formats of teacher lectures, watching a video, or taking a test (Shernoff et al., 2003), but the data from these previous studies did not include measures of instructional methods beyond these crude categories.

Conceptual Model of Meaningful Engagement Based on our ESM studies of engagement in classrooms (Shernoff et al., 2003; Shernoff & Hoogstra, 2001; Shernoff & Schmidt, 2008), a conceptual model of optimally engaging learning environments emerged. A consistent finding was that students frequently reported experiencing a high level of academic intensity (e.g., high level of concentration in challenging and important activities), but little enjoyment, or they reported just the opposite: a positive emotional response (e.g., high levels of enjoyment, positive affect, and intrinsic motivation), but low academic intensity. High academic intensity may lead to high levels of attention and short-term achievement (e.g., on a standardized test), but not necessarily to a longer term motivation. Positive emotions may not always be highly correlated with standardized test performance and grades, but they are a primary predictor of longer-term continuing motivation and academic performance (Shernoff & Hoogstra, 2001). Combining both aspects of experience is of utmost importance, however, because these experiences of meaningful engagement in high school lead to positive outcomes both in the short term (e.g., course grades in high school; see Shernoff & Schmidt, 2008) and in the long term (e.g., continuing motivation in the subject, grades in college; see Shernoff & Hoogstra, 2001).

How can teachers both facilitate a positive emotional response from their students and simultaneously create academic intensity? Teachers facilitate the positive emotions of their students in part by modeling their own enthusiasm, but mainly by supporting their students and their needs, which is done by providing choice, affirming students' abilities, scaffolding, expressing care, and otherwise providing a supportive learning environment (see Chapter 18, this volume). Teachers solicit academic intensity by holding high expectations for critical thinking and rigorous work and by challenging students to meet them. A fairly consistent finding throughout the engagement literature is that teachers who positively and meaningfully engage students combine support and challenge dimensions. In other words, they support (i.e., emotionally, interpersonally) their students to meet the challenge of high-level thinking or completing high-quality work. A variety of studies of engagement using detailed classroom observations have similarly revealed that a combination of environmental challenge and emotional support provided by the instructor is optimally engaging for students (Dodecal, Walsh, Pressley, & Vincent, 2003; Lutz, Guthrie, & Davis, 2006; Skinner & Belmont, 1993; J. C. Turner & Meyer, 2004). For example, optimally engaging teachers might require fewer problems, but challenging ones, and support the competence necessary to solve them independently (J. C. Turner & Meyer, 2004). These teachers also ask questions for higher order conceptual understanding, combined with emotionally supportive provisions for scaffolding, feedback, strategies, and encouragement to take
risks (Dolezal et al., 2003; J. C. Turner & Meyer, 2004). Engaging teachers also model emotional supportiveness through enthusiasm, humor, and risk taking.

The importance of combining challenge and support dimensions for promoting engagement was illustrated in Skinner and Belmont’s (1993) study. Teacher involvement, found to be central to student engagement, included a balance of autonomy support on the one hand, and provisions for structure on the other. Involvement reflected a supportive relationship between teacher and student, such that the teacher was attuned to and made time for the student and enjoyed their interactions. However, equally as important was providing structure, which included communicating high expectations and providing consistently and predictably.

Recent initiatives to apply positive psychology to educational practice (Gilman, Hutchner, & Furlong, 2009) deepen the potential meaning of both challenge and support dimensions. For example, teachers can stimulate students’ emerging sense of self by challenging students to imagine possible selves or to develop new capacities for care, gratitude, hope, creativity, and optimism. In the process, they can not only support but uplift students through effective encouragement, specific and well-timed positive feedback, celebrating personal achievements, speaking authentically about students’ strengths, and modeling humility (Brophy, 1981; Dweck, 1999; Nelmsin & Sheroff, 2009; Sheroff, 2001).

Challenges of Implementing Engagement Research

Psychological principles (e.g., American Psychological Association, 1997) to engage youth in learning inevitably center around supporting the emotional needs, interests, aptitudes, and goals of individual students. Teachers, however, deal with large groups. On the basis of extensive observations of school classrooms, Jackson (1969/1990) observed that motivation and learning lay more on the periphery than in the focus of a typical school teacher’s vision while teaching compared with the balancing acts of leading the curriculum, managing the class, and assessing content. These realities may inevitably make even the most sincere teachers compromise their ideals in terms of how much individualized attention they can provide each student (Sier, 1984). Past research and related theory, therefore, frequently do not account for the practical problems teachers encounter in facilitating and maintaining engagement because of the necessity of managing large groups of students, with increasing accountability pressures to teach and evaluate specific content (Reeve, 2009; Sier, 1984). Furthermore, most motivational theories were not developed in classrooms and tested for teacher implementation (J. C. Turner, 2010).

To address this problem, research on evidence-based models for promoting engagement (i.e., programs or learning environments for youth with research evidence demonstrating high student engagement) would be of maximum benefit to practitioners. Descriptions of relevant programmatic features and their effects on students would help to illuminate not only what promotes engagement, but also how it can be fostered. One strategy, helpful to teachers, would be to identify and describe empirically based models of engaging learning environments in the context of classroom teachers’ potential to promote such environments as sources of collective engagement.

Instructional Practices Promoting Engagement in Public Schools

In a recent study, Sheroff, Tonks, Anderson, and Dorch (2011) investigated the following question: What is the immediate impact of various instructional practices used by teachers in high school classrooms on student engagement? Student engagement in high school classes was captured by means of the ESM and linked to instructional practices from video-recorded classroom observations. Seven class sessions in two Midwestern high schools were observed with ninth- to 12th-grade student participants (N = 140) taught by teacher participants (N = 5) of English, math, science, social studies, and Spanish. The videos were coded for instructional practices, including main instructional format, and specific instructional features (e.g., rules of activity or task-specific instructions), as well as for student behaviors and student engagement, yielding an acceptable interrater reliability (i.e., Cohen’s k = .80 for all coding categories).

Overall, 322 self-reports were collected from the 140 student participants, who were signaled two or three times in the observed classes (depending on class length), and approximately 8 hours of video material was captured. Nevertheless, results were preliminary considering the low number of participating teachers and classes observed. Somewhat unexpectedly, the predictive power of instructional methods in the ESM measure of engagement, as assessed by regressing 25 instructional practices coded from the videos onto engagement, was high (adjusted R² = .87). These were also significant differences in student engagement and perceived learning (as also measured by the ESM) by teacher—subject and class. Although results may be partially explained by the small number of teachers and the large number of predictors associated with their specific instructional styles, the instructor appeared to be a very powerful factor influencing both engagement and perceived learning.

On the basis of previous studies (e.g., Sheroff et al., 2003), Sheroff et al. (2011) expected high engagement during small-group work, group discussions, and low engagement during lectures and videos that tend to be more teacher centered. In many cases, results revealed the opposite of these expectations. Some of the highest levels of engagement were reported during lectures in all three classes using lecture, and some of the lowest levels of engagement and perceived learning occurred during larger-group discussions featuring a high level of discourse (e.g., supporting verbal arguments with evidence). As hypothesized, sustained student engagement and perceived learning were created most commonly through optimal learning environments, or through simultaneous, conditions that stimulate flow experiences. These conditions included optimal challenge, a complex task often involving the use of materials, clear and important student goals for the activity, teacher monitoring and feedback, high teacher expectations, and good rapport between teacher and students (see Table 8.1 for the characteristics and associated subjective experiences of optimal learning environments, and see Exhibit 8.1 for illustrative scenarios).

This basic finding was consistent with Dolezal et al.’s (2003) main finding in their classroom observation study that students were more motivated when teachers used more empirically based motivational strategies at once; in this sense, optimal learning environments were marked by complexity in which a variety of engaging dynamics were in play simultaneously. Optimal learning environments were frequently created through structured tasks in individual or small-group work with teacher monitoring. Other instructional practices that increased engagement were varied and subject specific. One instructional practice that enhanced engagement during direct instruction, for example, was teacher instructions directing concurrent student action (e.g., solving board problems with a
TABLE 8.1

Optimal Learning Environments: Characteristics and the Quality of Associated Experience

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Subjective experience supporting learning</th>
</tr>
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<tbody>
<tr>
<td>1. Environmental complexity: Combines environmental challenge (e.g., high task challenge and expectations for mastery) with opportunities (e.g., relationship support, autonomy support)</td>
<td>1. Meaningful engagement: Experience of challenge, concentration, and importance simultaneous with positive emotions (e.g., enjoyment, self-esteem, control, intrinsic motivation, interest, creativity, and excitement); merging of work and play; in retrospect, happiness and fulfillment, leading to continued motivation and commitment</td>
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<tr>
<td>2. Importance of activity is made clear</td>
<td>2. Perception of activity as personally important; sense of purpose</td>
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<tr>
<td>3. Complex task usually involving the use of materials: solving problems or fashioning products</td>
<td>3. Deep concentration; Immersion</td>
</tr>
<tr>
<td>4. Positive relations or rapport with instructor and peers</td>
<td>4. Feelings of belongingness, acceptance, and self-esteem</td>
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<tr>
<td>5. Goals of the activity are made clear</td>
<td>5. All attention is focused on relevant stimuli toward reaching the goal</td>
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<tr>
<td>6. Interactivity with peers and adults: opportunities to contribute or take initiative</td>
<td>6. Use of skills, enjoyment, self-esteem, spirit of cooperation, collaboration, or both; involvement</td>
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<tr>
<td>7. Feedback from instructor, peers, or both: effective scaffolding</td>
<td>7. Perceived learning and building of skills</td>
</tr>
<tr>
<td>8. Challenge appropriate for skills (challenging but not impossible)</td>
<td>8. Concerned effort: sustained concentration, interest, and enjoyment; self-efficacy; skill building, knowledge accumulation; gratification of successful effort</td>
</tr>
</tbody>
</table>

Note. Environmental complexity is the most fundamental and global characteristic of optimal learning environments, and several of the subsequent characteristics are also present. Not all characteristics and associated experiences are always present.

Exhibit 8.1
Illustrative Scenarios of Optimal Learning Environments

1. Every student is assigned complex science lab problems involving measurement and drafting with a mutual larger goal; work occurs in small groups for peer consultations and support; students use necessary lab materials to complete the project groups; the teacher promotes all groups and also is providing feedback. Work is expected to be submitted for review at the end of class. Students are highly involved.

2. The activity is a whole-class Jeopardy or other trivia game on history facts and knowledge using PowerPoint or the board. Teacher is enthusiastic and animated. Questions are interesting and pertinent, important, relevant, historical events or issues. Students both ask each other and answer the questions while the teacher moderates. Rules for playing and winning the game are clear. Many choices are inherent to the game. Students are extremely attentive and intrinsically motivated.

3. The teacher is making a presentation on the board (e.g., solving math problems) or showing a video (e.g., foreign language featuring vocabulary words). Students are provided with the materials to complete an activity concurrently—for example, math problems to be solved with a calculator simultaneously with the teacher or vocabulary words with definitions and examples to be completed that are contained in the video. The teacher is interactively asking questions of students during the presentation and providing feedback with respect to answers. This is preparation for an upcoming test or quiz, and students should continue to work on similar problems for homework even when mastery is achieved. Students are quiet, but wheels are turning.

calculator simultaneously with the teacher). Of all the perception items measured (e.g., control, activity level, belongingness), the one most strongly related to both engagement and perceived learning was the perception of importance (i.e., the student regarded the activity as personally important). Overall, findings suggested that it was not so much the choice of main instructional format but rather how the activity was implemented—including the rules of the activity, task-specific instructions, and seating arrangement—that was the critical factor for students’ engagement.

Although the reasons for relatively low engagement, perceived learning, and perception of importance during group discussions that had yielded a high level of discourse were left open to interpretation, it was clear that an optimal learning environment was not established. Upon close observation of the video data, it was apparent that any given student contributed to the discussion only several times during the class and spent the rest of the time listening to other peers. Most of this time, the students were not engaged in a complex task exacting high cognitive effort, or with clear criteria providing criteria to receive performance feedback (despite the fact that the teacher skillfully and repeatedly expressed her goals for the activity). Consistent with the ESM data, subtle signs of straying attention and disengagement could be observed in the video data.

Because multiple components of engagement were measured both with the ESM and by observation, Shernoff et al. (2011) were interested in the relationships among the measures. The ESM measure of engagement was more strongly related to perceived learning and attention than any of the observational measures of engagement. The observational measures of cognitive and behavioral engagement (adapted from Lutz et al.’s 2006 study) were bimodal and strongly correlated with each other. They appeared to be limited primarily to the observer’s judgment of whether the student was on or off task but had little role in self-reported engagement including students’ level of concentration, interest, and enjoyment.

Overall, Shernoff et al.’s (2011) findings were preliminary but highly suggestive that instructional approach is a major factor with the potential to highly engage students in traditional public school classrooms. I next consider a study suggesting that immersive technologies can also be used to considerably engage students in the context of public school classrooms. Although the study focused on undergraduate classes in mechanical engineering in a Midwestern public university, the findings may be applicable to all students old enough to play complex educational video games using significant domain skills, including high school students.

Engagement in Educational Video Games

Computer games created for instructional purposes, such as mathematics computer games, have been found to create dynamic and motivating learning environments at many grade levels, including high school (Seiger, Groom, Drachman, & Briggs, 2005). Coller and colleagues (Coller & Shernoff, 2009; Coller, Shernoff, & Strati, in press) assessed the engagement of university students who used an innovative approach to taking a challenging engineering course, Dynamic Systems and Control. Instead of using the traditional approach based on problem sets from a textbook (control year), a comparable cohort of students taking the same course in an experimental year learned relevant principles of mechanical engineering by playing an educational video game in which they raced a virtual car around a track for all of their lab exercises and homework. Results revealed that students who had completed their coursework using the instructional video game reported greater flowlike engagement, intrinsic motivation, positive affect, and creativity than the students who completed their coursework in the traditional way. Indicative of flow experiences, students taking the game-based course were more frequently reported that their experience felt like both work and play, whereas the students in the control year more frequently reported their experience felt like work only. Engineering courses typically offer a high level of intellectual intensity, in which students feel that materials are challenging and important. The video game approach maintained the high level of rigor inherent to the challenging engineering course while adding the perception of feeling active, creative, and in control characteristic of flow activities. The students who interacted with the video game also demonstrated greater depth of knowledge and better performance in the course, which appeared to be related to their enhanced engagement in the course.

Flow theory has been a theoretical base for exploring the implications of "e-learning" through educational video games because of participants’ sense of immersion or being enveloped in a virtual
reality, which can precipitate a deeper engagement with learning (Hodgkiss, Millin-Burghurst, Fostner, May, & Kato, 2002; Sosdskay & Shilton, 2007; Wimmer & Singer, 1998). E-learning games are aimed at the achievement of learning goals through flow experiences (Su, Yu, & Yang, 2000) and are particularly useful for motivating the optimal level of challenge to keep players immersed and on the edge of their abilities (Gee, 2007). Scales developed for evaluating enjoyment in playing e-learning video games, called GameFlow or EGameFlow, help designers to identify strengths and flaws in their programs from the learner's point of view (Su et al., 2003; Sweetser & Wyeth, 2005). They consist of eight dimensions supported by factor analysis and achieving satisfactory validity and reliability (Su et al., 2009). Immersion, Social Interaction, Challenge, Goal Clarity, Feedback, Concentration, Control, and Knowledge Improvement. Perhaps because video games are a large consumer industry, e-learning is therefore one area highly interested in creating optimal learning environments, even if virtual ones: those preventing multiple, simultaneous conditions for flow to facilitate learning.

I now turn to engagement in several learning environment models alternative to traditional public school classrooms.

Evidence-Based Alternative Models for Promoting Engagement

Murray High School: A case study of an alternative high school. Studied by Jones (2008, 2009, in press), Murray High School in Charlottesville, Virginia, primarily serves students who have dropped out of other public high schools or were identified to be at risk of school dropout. Despite a student population at high risk for poor educational outcomes, it has a graduation rate of 93%, higher than the state and district averages. It also outperforms schools in the rest of its district and state on average standardized achievement test scores. The school's philosophy is based on William Glasser's (1996) choice theory. Although choice theory asserts a variety of principles and beliefs beyond the scope of this chapter, among its 10 axioms are the following: "The only person whose behavior we can control is our own" and "All long-lasting psychological problems are relationship problems" (also see Wubbolding, 2007). The school program was designed to safeguard the developmental needs of the students. For example, it offers students choices to support freely chosen behavior and mediation to support vital relationships within the school. Choices are designed to help students make their own plans for action to promote individual responsibility in the context of a strong support system. When there are relational conflicts, mediators are initiated of a small, safe, and supportive group of staff and students focusing on the causes of behavior (rather than on only the consequences of behavior) in the context of students' needs. Promoting student needs of personal freedom and positive relationships were intentionally designed to be core components of the school's climate.

Results of Jones's (2008, 2009, in press) qualitative studies combining interpretive ethnography and interviews reveal that, grounded primarily in the quality of the relational environment, students experience a dramatic improvement in their level of engagement at Murray compared with their previous schools. Many students shared the general perception that nobody cared about them in their previous schools, but they felt that at Murray, staff got to know them individually, making them feel like part of a family. As a result, students felt as though they were "taking themselves around" (Jones, 2008, p. 27). They directly testified to feeling more engaged; unlike in their previous schools, many were participating in all of their classes and active in school governance (Jones, in press).

Additionally, the learning goals at Murray are geared toward achieving mastery of subjects, not merely passing them. Assignments are individualized to the students' abilities and styles to reach these mastery goals. The objective is to support the whole student, including learning and competency goals. Rather than leaving the extent of student learning to vary in a predetermined amount of time, mastery is a firm expectation, and the amount of time it takes to achieve it may vary by student. This approach virtually eliminates failure as an acceptable option and in the process also assures a deepened engagement and quality of learning (Jones, 2009). I now discuss several of the key issues related to high engagement at the Murray School.

Relationship support as key to engaging environments. Jones (2008, 2009, in press) case studies of Murray High School illustrate that supportive relationships with peers and adults are an integral feature of settings promoting the motivation and development of youth (Eccles & Gootman, 2002). Developmentally speaking, adolescents are fully embedded in a world of interpersonal relationships (Kegan, 1992). As students enter middle school, their social networks have an increasingly important social-emotional influence on their attitudes toward school and motivation to succeed (Furlong et al., 2003). Because of the pervasive influence of relationships on multiple facets of student motivation, Martin and Dowson (2009) recently demonstrated the importance of dimensional motivational theories may be conceptualized in primarily relational terms. A growing number of studies have supported this view.

Voluminous and remarkably consistent research findings support the proposition that the quality of student-teacher relations, or relational support from the teacher, is positively associated with the quality of students' engagement in school or classrooms (Furrer & Skinner, 2003; Hughes & Kwok, 2007; Kail & Ziol-Guest, 2008; Klein & Connell, 2004; Meyer & Turner, 2007; Skinner & Belmont, 1993; Wentzel, 1991, 2009). These findings were also reflected in Roorda, Koomen, and Oer's (2009) meta-analysis. Various studies have found that when students believe that the teacher is warm and caring, is understanding and dependable, and supports their autonomy, they are more likely to feel accepted, have more positive affect, work harder, persevere in the face of difficulty, accept direction and criticism, seek help more, cope better with stress, and be more attentive (e.g., Hughes & Kwok, 2007; Martin & Dowson, 2009).

For many students at Murray, improved school performance can also be at least partially explained by enhanced teacher support, which studies have found leads to student achievement (Roorda et al., 2009). Indeed, studies have shown that the relationship between teachers' academic support and achievement is mediated by engagement (Hughes & Kwok, 2007). That is, when students feel that their relationships with their teachers are emotionally supportive, they report more interest and enjoyment in schoolwork, have increased self-concept and higher self-efficacy, and are more likely to use self-regulatory strategies (Patrick, Ryan, & Kaplan, 2007). Teachers can also facilitate a positive social environment and promote interaction among peers, including the mutual exchange of ideas, perspective taking, and reflective thinking (A. M. Ryan & Patrick, 2001).

Relationship between engagement and achievement

Although a good deal of research has shown that student engagement is positively related to achievement (Kelly, 2008; Marks, 2000; Sirin & Rogers-Sirin, 2004; Voelkl, 1997), a variety of studies also suggest that engagement is not the same thing as achievement. For example, the tendency for there to be many high achievers who are not highly engaged as well as many low achievers who are engaged is a significant trend internationally (Williams, 2003). Furthermore, an emphasis on achievement and accountability through normative evaluations may do much to undermine both engagement and meaningful forms of learning (Kohn, 2000). When classes become unidimensional in what is evaluated, that is, based on a single criterion or narrow set of criteria, students display failure-avoiding behavior such as withdrawing effort to protect their sense of self-worth (Rosenholtz & Rosenholtz, 1981). The preponderance of standardized evaluations has been observed to produce a climate that frequently demoralizes rather than inspires. E. Turner and Waugh (2007) documented student reactions of devastation on receiving unfavorable test results: Shell-shocked by the prospects of failing their class, students not only became disengaged in learning but experienced a sense of disassociation that profoundly impaired their ability to attend in class.

Finn's (1989) participation-identification model suggests that a history of school failure is a key factor in a continuing cycle of disengagement often culminating in dropout. Thus, for some youth, chronic disengagement and school failure may be rooted in the lack of a reasonable chance to succeed. Students' beliefs about what they can accomplish are shaped,
at least in part, by prior levels of success (Bandura, 1997). In addition to one's expectancy for future suc-
cess, one's value of schooling may be strongly influ-
enced by prior performance, with both predicting
subsequent motivation (Wijks & Eccles, 2000; see
Volume 1, Chapter 13, this volume). Glaser (1975)
has argued that failure is built into traditional
schools for a substantial number of students who consistent-ly perform on the bottom of the achieve-
m ent distribution, thus undermining both expec-
tancy and value motivational components.

Glasier Institute schools such as Murray address
this problem by instituting mastery by means of
school policy. Rather than a curricular unit and
a standard amount of time being the constant for all
students, the failure being the variable, Glasier
do just the opposite: Mastery is the constant for all
students, and the time it takes for individuals to achieve it varies. Is such a system
tenable, or even desirable, for the larger educational
system? Perhaps not, but to the extent that it is not,
one must come to grips with the reality that one
function of school is to provide a sorting mecha-
nism of students into a competitive economy, with
winners and losers, largely serving to reproduce the
socioeconomic status quo (Bourdieu & Passeron,
1977/1994; Bowles & Gintis, 1976). In the current
system, educators believe that students should not be
shielded from failure, but rather that they must
learn to respond to failure with increased effort and
better strategy use. Although this is ecologically
adaptive, one must also consider whether it is really
ture that all students would succeed with high effort
and effective strategy use, or whether success is at
least partially defined by others failing.

Ironically, highly ambitious and competitive
drive to achieve can also interfere with authentic
engagement in the learning process. For some
students, the imperative or pressure to achieve detracts
from authentic interest. For example, school was lit-
tle more than a grade game in Pope's (2001) study
of high-achieving students. Meanwhile, their drive
to achieve in school was exacted a psychological toll
on their disposition toward learning and degenerated
into academic dishonesty for several youths. In fact,
two thirds of all high school students stated that
they had cheated on a school test, and 90% said they
had copied someone else's homework, a single aca-
demic year (Skiba et al., 1996). In a recent study of
1,669 high school students in three top-perform-
ing schools in the Bay area, Conner, Pope, and Gal-
kwyo (2010) found that two thirds of the sample
were high on behavioral measures of engagement, but
only one third exhibited a deeper emotional and
cognitive engagement with learning. The behaviors
reported by highly engaged-ones were not compe-
tent effort and intrinsic motivation suggested that
after-school programs may be an ideal environment
for stimulating meaningful engagement (Sherhoff &
Calszysmuthy, 2009).

Following up on Vandell et al.'s (2005) study,
Sherhoff and Vandell (2007) found that when in
the after-school programs, students were more engaged
during sports and arts enrichment activities and least
engaged when in home work help sessions. Affect
was significantly higher while students were
engaging in academic enrichment activities than in
homework, which may have been partly because of
the mandatory nature of homework, however, a pos-
tive emotional response appeared to be stimulated
when academic work was approached as a group
activity with frequent feedback that allowed stu-
dents to demonstrate their skills and initiative.
These results corroborated research findings that
after-school programs provide a context in which
adolescents become engaged as a result of a diversity
of enriching activities in the context of frequent
interaction and caring relationships with both peers
and adults (Eccles & Gootman, 2002). Furthemore,
they supported meaningful engagement
through an appropriate balance among challenge,
structure, and supervision on the one hand and the
choices and freedom to support intrinsic motivation
on the other.

More recently, Sherhoff (2010a) found not only
that participation in after-school programs improves
students' engagement but also that the enhanced
engagement experienced in after-school programs
was a mediating variable leading to positive develop-
mental outcomes such as social competency. In
addition, students who were more engaged in
an after-school program relative to other out-of-school
environments earned higher end-of-year grades in
math and English. More specifically, students who
perceived program activities as relatively important
and challenging improved their grades in those sub-
jects over the course of 1 year. Such findings
were consistent with those of Mahoney, Parente, and
Lord (2007), demonstrating that students in higher quality
after-school programs displayed higher competencies
and better adjustment than those in lower quality pro-
grams. High-quality programs were those in which
provisions of support and challenge (for example, a
structured organization, a positive social climate, and
opportunities for skill-building) led directly to high
energy and engagement among the participants.

Lessons From After-School Programs
After-school programs supporting positive youth development usually promote integra-
tion, or the intentional focus on design and implementation to support the development
of youth (Walker, Macek, Blyth, & Borden, 2005). Compared with traditional schooling,
high-quality after-school programs are intentionally designed to promote a wider range of 21st-century
skills such as self-determination, good work habits, emotional adjustment, identity development, optimism toward
the future, and other developmental capacities of a well-rounded person (Lerner, 2004). Students' engagement
in programs is central to developmental intentionality. The goal is designing effective pro-
grams is not merely participation, but also for the participants to be focused and excited—that is,
to have optimal experiences—as they are engaging in them. Especially because after-school programs are
voluntary, engagement is the essential ingredient for continued participation.

To move beyond current delivery that frequently
fails to engage youth, there must be an intentional strategy to infuse curricular content with engaging
activities for enrichment (Noam, 2004). For exam-
ple, informal learning at science museums, extracur-
ricular art programs in which students work
alongside adult artists, or involvement in studio
work with musicians can provide alternative ways of
meeting learning goals by applying knowledge in the
real world (Pittman, Irey, Yoselam, & Wilson-Als-
strom, 2004). One illustrative model comes from
Youniss and Yates's (1997) classic study of students who
volunteered to work in a soup kitchen in the
context of a course on social justice. The study found not only that the youths' experiences stimulated their political awareness of, identity for, and sensitivity toward community problems, but also that many of the participants continued along a path of interest that originated in the social justice course. Similarly, Brophy and Leach (2010) found that for 74% of their sample of history experts, the most formative, catalytic experiences for developing their lifelong career interest occurred during childhood or before high school. Most of these early experiences occurred in informal, out-of-school environments, with in-school experiences becoming more salient in their later development of history interest.

The high level of engagement reported in organized after-school programs is particularly significant in light of the pervasive lack of engagement in classrooms and unstructured activities outside of school. It is interesting to consider that school-based programs occur in the same place as classrooms—schools—and often with overlapping students and staff. How can it be that one context provides a peak in students' engagement while the other—the place students are supposed come together to learn—provides the trough? Regardless of the answer, one implication is that engagement, and engaging environments, inside and outside of classrooms need not be conceptualized and approached as completely separate entities. Many educators would like students to experience a similar quality of engagement in academic tasks or classroom activities that are frequently reported in after-school settings. This may be achieved by understanding and applying the conditions that engaging environments frequently have in common. Another implication of the after-school model is considering the role of setting in youth engagement (Yonezawa et al., 2009). Because the association between classrooms and disengagement in high school, setting and end, settings outside of classrooms are often required for students to believe that activities are not merely academic exercises for the purpose of being evaluated by an instructor. In such settings, participants find an authentic role and keep each other accountable in tasks that the group agrees have meaning. Learning in academic and arts enrichment contexts, especially compared with learning reported in academic classes or homework help sessions, is highly engaging because it is often project based, relevant to the lives of youth, and includes fluid and ongoing feedback from peers and adults.

Only when the features of settings that support youth engagement are better understood, however, will policymakers and educators be able to systematically alter educational environments to produce positive youth outcomes. To be useful to educators, researchers interested in youth engagement will need to improve on the dearth of rich, ethnographic descriptions of educational youth programs and the practices empirically found to engage youth.

**CONCLUSIONS AND IMPLICATIONS**

Research converges on the observation that meaningful engagement is composed of two independent processes—academic intensity and a positive emotional response—and that optimal learning environments combine both to make learning both playful and challenging, spontaneous and important (e.g., Rathsunde & Colsonmichuhi, 2005; Shernoff et al., 2003; J. C. Turner & Meyer, 2004). Educators facilitate meaningful engagement by virtue of combining high challenge and expectations for mastery (challenge dimension) with emotional supportiveness and scaffolding (support dimension). Engaging youth by means of principles for supporting and challenging them has been advanced through a number of frameworks, such as authoritative parenting (Steinberg et al., 1996) and differentiated instruction (Tomlinson, 1999). Approaches such as these make central the learner's background, level of development, needs, interests, and capacities, and therefore aims toward the ideal of individualized instruction. Although a great deal of research in educational psychology, as summarized by the American Psychological Association's (1997) learner-centered psychological principles, suggests that instruction should be individualized, it is appropriate to question how realistic such an ideal is—especially because schools, both historically and in the present day, were designed largely to serve masses of students (Tyack, 1974).

What to do, then? Should we expect Sizer's (1984) fictitious character, Horace, symbolizing the plight of many teachers, to spend even more time reading and making individualized comments on customized writing assignments? Like many principles of educational psychology, it is their implementation in group settings that has remained the greatest challenge for practitioners. In this chapter, I suggested that practitioners would be aided by identifying and describing models and practices that have been empirically shown to engage youth in group settings. Is the suggestion, then, that the goal of individualizing instruction must be abandoned? Some of the most observable and original educational thinkers suggesting alternative systems of education to the traditional model—such as John Dewey, Maria Montessori, and William Glaser—converged on the insight that what is important is not individualizing instruction per se so much as Meeting All Individuals' Needs (MAIN may be a useful acronym for the implied, overarching theory). For example, Dewey (1896/1973) consistently wrote about the importance of a pupil's interests as an organic outgrowth of self-expression, but he clarified that the implication of this principle is that the teacher was neither to create artificial inducements to attract interest nor to develop an individualized curriculum tailored to each child's interests. Doing so would be aiming directly for a child's interests; rather, he suggested aiming at the conditions that, in a sense, lie in back of them, which must be provided by providing an environment with the physical, social, and intellectual resources to support the child's underlying impulses, desires, and needs. Such an environment would allow interests to grow naturally alongside other processes of development (Dewey, 1975). Such an insight foreswathed self-determination theory, which argues that when basic human needs are fulfilled, motivation then floursishes (Connell & Wellborn, 1991; Deci & Ryan, 1985). Indeed, an examination of empirically supported educational environments that promote engagement are often those for which provision of safety and positive relationships build a foundation on which to succeed carefully build engaging activities and group interaction. Montessori (1967) and Glasser (1998) methodically observed, studied, and classified the developmental and psychological needs of children and focused on building educational environments around fulfilling those needs. This created educational traditions with track records of supporting both the developmental and the learning needs of students, thus achieving both important educational aims.

**Implications for Educational Practice**

High-quality alternative schools, after-school programs, and immersive technologies may be important models of alternative educational approaches, especially where engagement has been empirically demonstrated. In such learning environments, particularly those with concrete learning goals, students' engagement in learning is frequently supported when the conditions for flow are salient, and meaningful engagement is fostered through the combination of a high challenge for mastery and supportiveness. On the basis of the principle of intrinsic versus extrinsic motivation alone (R. M. Ryan & Deci, 2000), there can be little question that the involuntary nature of school is a motivational chip stacked against classroom engagement compared with engagement in voluntary settings. However, it is also clear both that (a) there is a great deal that classroom teachers can do to compensate, thereby dramatically increasing perceptions of autonomy in classrooms (Black & Deci, 2000; Reeve, 2009) and that (b) the involuntary nature of out-of-school time and other informal learning environments is far from the only factor contributing to high engagement in them. Recent research is beginning to demonstrate that such optimal learning environments also characterize peak engagement in traditional public school classrooms and that identifying characteristics of those environments that create episodes of flow, rhythm, or movement in which learning frequently occurs. For example, optimal learning environments typically create the perception that the activity is personally important to participants, foster belongingness and relatedness in the context of strong student-teacher relationships, stimulate interactivity among both the instructor and peers, and facilitate the building of new skills through working with domain-specific materials.
Engagement and Positive Youth Development

Transforming Schools and Communities: Toward Cultivating Youth Purpose

Engaging tomorrow's youth must include intentionally shaped learning about the real world in the context of purposeful pursuits. For example, to investigate how water pollution affects fish and wildlife, students might find themselves researching salmon cycles from multiple sources and creating articles on what they have learned, combining text and images with a variety of multimedia. New directions for engaging youth in the future may go beyond merely attempting to simulate real life as a response to the isolation of schools from the community. Rather, students may engage with community life as they pursue projects with real community value, form a variety of partnerships between the school and its surrounding community. One exemplary and inspirational model of this is the PeaceJam program (http://www.peacejam.org/), uniting youth with Nobel Laureates who create a curriculum for service revolving around their "Ten Global Calls to Action" to address issues of poverty, disease, famine, violence, and the point of political interest and discrimination. Youth volunteers for community, national, or international service initiatives of their choice serving one or more of these goals and present their service projects to a Nobel Laureate at an annual conference. Thus, both the curriculum and activities are centered around fostering youth purpose, with research demonstrating engagement and a strong sense of purpose among participating youth (Jones, Bench, & Warnaar, 2010).

Although PeaceJam typically operates as a club in the out-of-school context, it illustrates that schools and community organizations will need to become more deeply informed about each others' structures and operations and more directly invested in each other's efforts, if schools are to serve the educational aim of thriving, or helping students to cultivate a larger sense of purpose (Lerner, 2004). When schools and communities become stakeholders in each other's affairs, students may become engaged by the world outside school walls rather than feel imprisoned within them (Schutz, 2006). Research has shown that the positive development of youth occurs through a constellation of resources including families, schools, and communities; collectively, these resources provide physical safety and security, developmentally appropriate structure and expectations for behavior, emotional and moral support; and opportunities to make a contribution to one's community (Eccles & Gootman, 2002). These resources and provisions need to be highly considered in planning school and community transformation supporting the education and development of youth. In grappling with how the in-school and out-of-school worlds may be better integrated, schools may find that a blended approach becomes an ideal, one in which traditional academic goals intentionally interact with youth engagement activities (Noam, 2004). This approach could profitably take the form of extended-time school programs in which a variety of academic, extracurricular, technological, physical, and enrichment activities are intentionally blended in both formal and informal environments.

Flow, Engagement, and Well-Being

Flow, or becoming totally absorbed in an activity to the point of losing self-consciousness and a sense of time, is a central experience of the engaged life, one of three paths to human happiness (Csikszentmihalyi et al., n.d.). A key recognition of the positive psychology movement is that engagement is clearly synergistic with well-being for all ages. In youth in particular, engagement is positively related to resiliency and negatively related to behavioral difficulties (Bartisich & Hom, 1997). If engagement is to be concerned with the happiness and well-being of the younger generation, then engagement and purposeful activity would need to be at the center of efforts to build such positive education (Csikszentmihalyi and Csikszentmihalyi, n.d.). The positive psychology movement can thus be of maximum benefit in rethinking the aims of education. It suggests that in addition to addressing students' needs, education can also have a significant role to play in recognizing and building on students' strengths. Once basic needs have been met, engaging contexts proceed to awaken yearnings and callings, stimulate excitement, facilitate personal discoveries, and thereby invigorate self-esteem and individual strengths. By serving the aims of meaningful, long-term learning and psychological well-being, the propensity toward meaningful engagement in enjoyable and rewarding activities may be one of the most important outcomes of a good education.

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Chapter 9

CONCEPTUAL CHANGE INDUCED BY INSTRUCTION: A COMPLEX INTERPLAY OF MULTIPLE FACTORS

Stella Vosniadou and Lucia Mason

Instruction-based conceptual change research investigates learning requiring the substantial revision of existing knowledge under conditions of systematic instruction (Hatano & Inagaki, 2003; Vosniadou & Llounidis, 1998). Although the beginnings of this type of research can be traced to physics education, it is by no means restricted to physics but makes a larger claim about learning that transcends many domains of knowledge and can apply, for example, to biology (Carey, 1985; Evans, 2008; Inagaki & Hatano, 2002), psychology (Wellman, 2002), history (Leinhardt & Ravi, 2008; Tennyson-Parta, 1994), political science (Voss & Wiley, 2000), medicine (Kaufman, Reselman, & Patel, 2008; Patel, Arocha, & Kaufman, 1994), environmental learning (Richardson, Lundholm, & Hopwood, 2009), and mathematics (Vosniadou & Verschaffel, 2004). Recently, the term controversial conceptual change has been used to refer to certain topics such as evolution and environmental changes, or issues that are related to political and ideological differences and peace education, that are likely to arouse strong emotions and may require radical changes in attitudes and values (Sinha & Princh, 2003). We now review the main theoretical approaches to instruction-based conceptual change with a focus on the role of cognitive factors in knowledge revision.

PHILOSOPHICAL FOUNDATIONS

The problem of conceptual change first became apparent to philosophers of science in their efforts to explain how theories change in the history of science. Thomas S. Kuhn (1970), following other philosophers of science—such as Hanson, Toulmin, Feynman, Landau, and Lakatos—questioned the attempts by logical positivists to treat theory change as theory reduction (Suppe, 1977). According to theory reduction, a theory that enjoys a high degree of confirmation cannot ever be disconfirmed but can only be expanded to a new theory with a wider scope or be absorbed into a more inclusive and comprehensive theory. T. S. Kuhn argued that normal science operates within sets of shared beliefs, assumptions, commitments, and practices that constitute paradigms. Discoveries emerge over time that cannot be accommodated within the existing paradigm. When these anomalies accumulate, science enters a period of crisis that is eventually resolved by a revolutionary change in paradigm. According to T. S. Kuhn, different paradigms are incommensurable. Scientific knowledge grows as one moves from one to another, but it is no longer possible to imagine the results of scientific revolutions as a cumulative, linear progression.

T. S. Kuhn (1970) argued for a contextual view of concepts, not as abstract, rule-based definitions but as rich, interconnected networks of beliefs and practices embedded in paradigms from which they obtain their meaning. When there is a paradigm shift, there is conceptual change; that is, the meaning of the concepts embedded in the paradigm also changes. The scientific concepts in the new paradigm—even when they keep the same name they had in the old paradigm—are totally different from the old ones (incommensurable). They are now embedded in a different theory, have different interconnections to other concepts, and apply to different phenomena.

DOI: 10.1037/597-009
APS Educational Psychology Handbook | Vol. 1: Individual Differences and Cultural and Contextual Factors, K. N. Kane, C. Corbetta, and E. Urban (Editors-in-Chief)
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