

Chapter 2

Aims of Education Revisited (Einstein's $E=MC^2$ of Education)

... The aim (of education) must be the training of independently acting and thinking individuals, who, however, see in the service of the community their highest life problem.

—Albert Einstein

Introduction

Schooling cannot be evaluated nor improved without reference to the aims of education. Although the balance of this book emphasizes empirical evidence, the aims of education are necessarily philosophical. They cannot be proven or disproven; they are to some degree morally relative as rooted in societal values. This chapter presents a perspective on the aims of education from the little-known educational philosophy of Albert Einstein. The philosophical foundation presented will help to anchor the perspective on engagement and psychosocial well-being that follows. While multiple aims of education must coexist, and specific meanings and interpretations must change over time as conditions change, a comprehensive statement of aims can provide a useful foundation on which to build. Einstein's views on educational aims strike an unusual balance between nurturing individual and social potentialities, and his insights regarding motivation to learn, create, and achieve are equally illuminating. His views are largely supportive of a conceptualization of student engagement rooted in positive youth development presented in this book, in which engagement is frequently spurred by autonomous and authentic contribution to problem solving or the fashioning of products of value to the community. These views are also compatible with much of contemporary, "constructivist" thought about learning processes, although so far those principles have encountered obstacles to widespread employment in educational practice, as also discussed in this chapter. The chapter concludes by introducing additional axioms of engagement building on the historical axiom presented in Chap. 1: the importance of interpersonal relationships as a primary influence on engagement, the function of schools as

subservient to institutional and economic structures, and the usefulness of finding an organization and larger purpose of human activity in conceptions of human evolution.

A few philosophical observations may be helpful first. Most importantly, despite the historical model of schools as serving the masses, a mass is not an entity that learns. Only an individual, not a group, can have a thought or an idea. As Einstein recognized, “Only a free individual can make a discovery. Can you imagine an organization of scientists making the discoveries of Charles Darwin?” (Einstein 1945). Of course, a collection of well-coordinated individuals can work together and build on ideas and discoveries, such that the total production is greater than the sum of the parts. The point here is that, strictly speaking, *there is no such thing as mass consciousness*. Or as Einstein put it, “It is only to an individual that a soul is given” (Einstein 1954, p. 43). This is an especially important philosophical observation for teachers, because they are prone to thinking and talking to their class as though a single class consciousness exists. Reprimanding a class, for example, unless it applies equally to all students, is always based on this philosophical fallacy. The tendency to take answers from individual students in the class as a sign of “the class’s” competency (which of course does not exist) is another common example.

A very different philosophical observation was frequently articulated by John Dewey. Dewey observed that people learn as they participate in social and economic systems like the home or the community. Such participation was made meaningful by useful, necessary, and purposeful nature of tasks performed to serve those systems. He believed that a serious danger of traditional schools was the learning of knowledge and skills outside of their useful context, deprived of vibrancy, meaning, and purpose (Dewey 1937/1946). Dewey’s view of ideal learning in school was different from learning in the community only in that it was slightly more intentionally directed. “Intentionally directed” means that the environment was to be carefully prepared by educators who recognized that a *prepared environment* is the chief means of educating in the traditions of Rousseau (1762/1979) and Montessori (1964) (see Chap. 10 for a fuller discussion of Montessori principles). However, the school was not fundamentally different from an ideal society, or democracy; on the contrary, as the members of the school community grew, they would be inevitably nourished and sustained in and by a democratic society (Dewey 1966). Note that this vision is a more radical departure from conventional schooling than current “constructivists” perspectives towards “contextualized learning” (Brown et al. 1989; Cordova and Lepper 1996; Steffe and Gale 1995), which Dewey might rightly interpret as a backlash of the decontextualized learning of schools. Ryan and Powelson (1991) used the following analogy to describe modern attempts to contextualize learning:

Perhaps “wonder bread” provides the appropriate analogy for this scenario. Grain rich in vitamins and nutrients is stripped out of them, but once it is bleached and sterilized, its makers are compelled to reintroduce some of these nutrients back into the recipe. Accordingly, vitamins are artificially added in order to build healthy bodies in the proverbial “12 ways”. By analogy, with the invention of institutionalized schooling, learning and development are removed from rich natural contexts and, in order to build healthy minds educators have to reintroduce some of the relational elements that provided nutrient for learning in the first place (p. 64).

The recognition that individuals are the units who learn, think, and create, as expressed by Einstein, and that schools ideally nurture and serve communities, as expressed by Dewey, sets up a central philosophical question regarding the aim of education, if not *the* question: Should the goals of education serve primarily the welfare and development of the individual (student), or in the collective welfare of the community or society? It argued, on the one hand, that too much time and money is spent on personal growth, life skills, and nonessential subjects (i.e., other than math, science, language arts, and social studies) at the expense of collective achievement and competitiveness (The National Commission on Excellence in Education 1983); and on the other, that the real educational challenge is in meeting the needs of diverse learners, understanding that the curriculum must adapt to the backgrounds, strengths, and interests of individual students (Gardner 1993, 2006; Tomlinson 1995; Tomlinson and Germundson 2007). This is not a trivial debate. In fact, the history of educational reform in the United States can be viewed as a pendulum that has swung back and forth between an emphasis on individual freedom, development, and spontaneity and an opposing emphasis on high expectations to master "the basics" whenever individual freedom became to be perceived as too costly to the goal of collective or national superiority on those basics (Kaestle 1985). Therefore, the tension remains a central educational problem to be solved.

Fortunately, Einstein was not a bad problem solver, and proposed an aim of education that struck an unusual balance between individual and communal values.

Einstein's Proposed Aim of Education (or his "E=MC² of Education")

Laurence McMillin (n.d.), a revered master teacher and personal mentor profoundly influencing generations of students (see Shernoff 2001/2012), wrote an unpublished book manuscript titled, *Einstein's Theory of Education – Learning as a Creative Activity*. In it, he conceived of Einstein's aim as the key to his "theory of education," analogous to E=MC² as the key to his theory of Special Relativity. Einstein's less known educational "theory" was summarized in an address titled "On Education," on October 15, 1936. Einstein (1954) stated:

Sometimes one sees in the school simply the instrument for transferring a certain maximum quantity of knowledge to the growing generation. But that is not right. Knowledge is dead; the school, however, serves the living. It should develop in the young individuals those qualities and capabilities which are of value for the welfare of the commonwealth. But that does not mean that individuality should be destroyed and the individual becomes a mere tool of the community, like a bee or an ant. For a community of standardized individuals without personal originality and personal aims would be a poor community without possibilities of development. On the contrary ...

... *the aim must be the training of independently acting and thinking individuals, who, however, see in the service of the community their highest life problem* (p. 60, italics added).

Einstein's centering of educational aims around the training of independently directed individuals is certainly consistent with Dewey's child-centered education.

Around the turn of the twentieth century, Dewey asserted that shifting the center of education from the curriculum to the child would be like the Copernicus Revolution, when the astronomical center shifted from the earth to the sun (Dewey 1900/1990). Dewey's thoughts on the balance between individual and social aims of education were remarkably similar to Einstein's. Dewey believed,

If we eliminate the social factor from the child we are left with only an abstraction; if we eliminate the individual factor from society, we are left only with an inert and lifeless mass. Education, therefore, must begin with a psychological insight into the child's capacities, interests, and habits These powers, interests, and habits must be continually interpreted – we must know what they mean. They must be translated in terms of their social equivalents – into terms of what they are capable of in the way of social service. (Dewey 1897/1973, p. 445).

The educational imperative to focus on individuals (including their social proclivities) is well recognized in the actual practices of master teachers like McMillin, who frequently distinguish themselves by carefully observing and assessing individual students to identify their talents and interests (Shernoff 2001/2012). This ability, while rare, may be one of the most valuable services high quality teachers bring to the table, particularly important for discovering the work or occupations that an individual student is well suited for and enjoys. In fact, it was Plato's conviction that the *well-being of the individual and community are both served when students discover the work that they love* since this is when individuals are most happy and when society is best organized (Dewey 1916/1944). Furthermore, Plato believed that it was a primary function of education to put students' capacities into effective use, or as Dewey put it, translate them into their "social equivalents."

A master simplifier, Einstein's integration of both personal and social potentialities was derived by compressing the grand sweep of our cultural heritage:

(Ours) is a culture which has been nourished by two sources. The first derives from the spirit of ancient Greece, renewed and supplemented by the Italian Renaissance. It challenges the individual to think, observe, and create. The second derives from Judaism and primitive Christianity. It is characterized by the motto: Protect your conscience by selfless service to mankind. In this sense we may speak of our culture as having evolved from both creative and moral sources. (Einstein 1960, p. 161).

Einstein worried that as the first source historically exerted increasing influence, the second became increasingly neglected:

Down until the end of the Middle Ages cultural life derived its strength solely from the second, or moral, source. What resulted was a meager but stable culture. During the Renaissance, the wellsprings of man's creativity began to flow more freely, and ever more richly burgeoning culture ensued which, from generation to generation, down to our own day, has provided an unending source of inspiration. The consequence of this exciting evolution has been the creation of a powerful civilization and technology, together with very large increases in population and a rising physical and intellectual standard of living. We had apparently forgotten that the moral source remains vital to our existence. Now, however, we are dismayed to realize that this source has lost much of its power and that, without it, we are hopelessly doomed. (Einstein 1960, p. 161).

Schools have a tremendous opportunity if not a responsibility to address this problem, and certainly many efforts are already under way. Therefore, several

current models of youth engagement that focus on community service and civic engagement may help in restoring the cultural imbalance to which Einstein referred, in addition to fostering a sense of purpose beyond one's self. Einstein's formulation of what schools should "train" students to do is the equivalent of "thriving" from the perspective of modern conceptions of positive youth development. Lerner (2004) defines a thriving young person as an individual who "takes action to serve her own well-being and, at the same time, the well-being of parents, peers, community, and society" (p. 4). Lerner's research has found that the tendency of exemplary positive development is generative, towards the making of positive contributions to the self, others, and civil society. Demonstrating an integration similar to Einstein's, Lerner argues that "thriving young people – youth who make these mutually beneficial contributions to self and to society – are people whose senses of self involve a combined oral and civic commitment to contributing to society in manners reflective of their individual strengths, talents, and interests" (p. 5).

The unique balance encapsulated in this conceptualization of thriving is also reflected in those who do "Good Work," work that is at once personally fulfilling and meaningful, excellent by the standards of a domain, and socially responsible (Gardner et al. 2001). Gardner, Csikszentmihalyi, and Damon found that having a strong commitment to doing *good work* provides satisfaction when accomplishing goals and persistence when running into obstacles. In particular, moral values beyond one's self serve to clarify one's ideas and actions (Damon 1988). That is, it provides individuals with an important answer to *why* they do what they do and what the individual hopes to accomplish. The pursuit of good work as an ideal can help young people to choose goals that are both personally rewarding and socially meaningful, to pursue their dreams as a valued member of society without "selling out" to counterproductive forces and temptations.

More recently, Damon (2008) has argued that a strong sense of purpose, which Einstein considered to be (ideally) one's highest life problem, provides an individual with vital energy to persevere over the life span more so than any other factor. That is, it can provide young people with a "rudder" in an era of cultural drift. Implying the ability to both create and accomplish something meaningful on one's own *and* the desire to contribute to others in order to make a difference in the world, Damon and colleague's have found that a sense of *purpose* is closely connected to well-being. Psychologists pioneering Positive Psychology place the ability to forge a meaningful life prominent on the list of character strengths leading to authentic happiness (Seligman 2002; Peterson and Seligman 2004). Although pursuing purposeful tasks may require a great deal of sustained effort, it can also be deeply satisfying. Thus, artists, scientists, and other professionals are never happier than when in the process of solving a problem having benefits to others—which has been observed to be a powerful source of motivation and flow (Csikszentmihalyi 1996).

Einstein's solution to the tension between individualistic and social aims can therefore be summarized, even if an oversimplification, as the education of independently minded individuals towards collective ends. Since schools are public institutions, its aims must be directed towards the commonwealth as well as the individual. The relationship between the individual and society is necessarily

symbiotic; as Einstein asserted, “Without creative personalities able to think and judge independently, the upward development of society is as unthinkable as the development of the individual without the nourishing soil of the community” (Einstein 1954, p. 14). Einstein’s formulation makes as an aim of education modern conceptualizations of *thriving*, doing *good work*, *purpose*, and *flow*, all cornerstones of Positive Youth Development and Positive Psychology. In other words, it promotes happiness and well-being as an aim of education (Noddings 2003).

The Inversion and Restoration of Einstein’s Aim

Here’s the problem. The real shortcoming of traditional education can be summarized as the tendency to produce the exact opposite result of Einstein’s aim, or its actual *inversion*. Too often, mass education in its quest for standardization interferes with the nurturing of independently acting individuals and their unique potential. At the same time, the common goals of the community are increasingly neglected as the implicit goal of education is perceived to be singularly focused on the pursuit of individualistic ends: obtaining the degree and resume necessary for personal wealth, status, and recognition. Although our system of mass education is historically rooted, the recent policy emphasis on achievement through standardized testing was intended to address primarily the economic and military goals of the nation (The National Commission on Excellence in Education 1983). Aided by a culture that glorifies the wealthy and famous, and an individualistic emphasis on standard academic evaluation, students are less interested in the merits of cooperation and interdependency than the concern that classmates may negatively and “unfairly” impede their own performance (Kohn 1998).

Can students be blamed? Reflecting on the increasing lack of debate on the aims of education, Noddings (2003) comments, “It is as though our society has simply decided that the purpose of schooling is economic – to improve the financial condition of individuals and to advance the prosperity of the nation. Hence students should do well on standardized tests, get into good colleges, obtain well-paying jobs, and buy lots of things” (p. 4). However, these aims are worrisome in several respects. First, they are too narrow; surely, there is more to life than economics alone. However, even a bigger issue—and one with grave consequences for student engagement—is that when the aims of education parallel that of a capitalistic economy, such that the structure of schooling is fundamentally competitive, there are bound to be winners and *losers* (see Chap. 5 for a fuller discussion of this issue). When students are sorted into winners and losers, they are more likely to feel like pawns of the system rather than active agents and decision makers, and engagement suffocates from the lack of freedom to make one’s own educational goals and meanings.

In their classic work, *Habits of the Heart*, Bellah and colleagues (1985) recognized that the essential problem with individual freedom is what that freedom is

used *for*, something that is difficult for Americans to even define, and which becomes ever more obscure with more and more freedom. They observed that, increasingly, freedom in American society is the freedom to be left alone and free of the expectations and obligations of others. It is the freedom to have one's own values, to be one's "own moral universe" (p. 76), and the freedom to put one's energies towards utilitarian goals while using free time for personal leisure and self-gratification. Unfortunately, freedom to be left alone often translates into actually *being alone* or alienated from all sense of community, as Robert Putnam (2000) also observed in his book, *Bowling Alone*.

Increasingly, there is no common experience considered essential or important, no shared societal concerns—and least of all as a part of students' schooling. Damon (2008) argued that as one observes youth today, that all-important sense of purpose is what is most missing: "The most pervasive problem of the day is the sense of emptiness that has ensnared many young people in long periods of drift during a time in their lives when they should be defining their aspirations and making progress toward their fulfillment" (p. xiv). As we observe rising rates of depression and apathy in increasingly "motivated but directionless" generations, it is argued that students would not lose their vital life force as readily if they had a better sense of what they wanted to accomplish and why (Schneider and Stevenson 1999). Damon (2008) found that only about 20 % of youth had a strong sense of purpose, and 25 % (referred to as the *disengaged*) had no or only a vague sense of purpose. Once again, however, youth cannot necessarily be blamed as long as purpose (as opposed to only achievement) remains a marginal concern for education. Schools especially fall short in offering youths insight into paths that they will find meaningful, instead offering only specialized knowledge. It is repeatedly observed that students have no idea why they are asked to learn a given history, math, or social studies lesson.

Traditionally, capital E "Engagement" was referred to as one's "calling" in life. Although this term is now dated, the concept has not lost its importance; it refers to a sense of moral elevation, gratitude, joy, and, in some cases, closeness to God felt by the awareness that one's unique talents may be matched to some special or societal purpose (Colby and Damon 1994). One of the most important functions of schooling, albeit one receiving the least attention, is putting young people in touch with their unique callings in life. If the development of small e "engagement" to capital E "Engagement" underlies this function, as I believe, this alone places engagement as a top priority educational outcome.

Educators and mentors are essential in facilitating this matching of individuals to callings since they play a role in the development of the unique abilities of their students, and also have a broader awareness of their social and professional uses (Nakamura and Shernoff 2009). In fact, one factor that seems to make the most difference in the development of a "purpose-driven life" (Colby and Damon 1994) is the presence of a meaningful adult who sees in a young person both his outstanding strengths and their "social equivalents," to use Dewey's terminology. Educators may have a particularly large role to play in aiding the 25 % of youth who are classified as completely disengaged or unpurposeful, those who don't know where to start.

The goal would not be to tell these youth what they should value and find important so much as to steer them in possible future directions based on their strengths and expressed interests.

Einstein's "Theory of Motivation"

A slightly more succinct statement of Einstein's proposed aim was stated this way: "The school should always have as its aim that the young man leave it as a harmonious personality, not as a specialist" (Einstein 1954, p. 64). Dewey also believed that the aim of education was a "certain quality of character" of the individual, defining "character" in very broad terms. For Dewey, an important aim of education was "an increase in the powers of the mind," including one's social, aesthetic, and ethical potentialities, "rather than an enlargement of its possessions" (Dewey 1974/2000, p. 5).

Like Dewey, Einstein believed that the business of schools was not merely the transmission of large amounts of knowledge, but rather the transferring of cultural and moral traditions from one generation to the next. This is especially true as modern economic life has increasingly weakened the role of the family as the bearer of those traditions. Cultural traditions are sustained and evolve as creative individuals interact with them and incorporate them as personal knowledge. Despite the tendency for schools to pour more and more information into students, Einstein did not refer to knowledge as important, except when translated into functional skill and action.

As quoted earlier, Einstein considered knowledge to be "dead." But how then, as he put it, can we "serve the living?" The key may reside in the (training of) "independently acting and thinking individuals." This "independently acting and thinking" aspect of a "harmonious personality" used to be called "the will," and thus the first part of Einstein's aim could be simplified to "the training of the will." The will is the creative force of the individual, and thus the creative will—and not the ability to sit and be mechanically taught—is the driver of learning. Without the will there can be no learning, and with it, possibilities for learning are nearly infinite.

Controlling—or alternatively, failing to control—the will is a central educational problem. We all have a large variety of personal impulses and urges—some social, some biological. Satisfying both our biological urges and societal expectations is a fundamental developmental task; the tension between these two forces places individuals in a bind which becomes a developmental problem to solve. As has been observed before, how satisfactorily we solve this problem has major implications for civilization (Freud 1930; Goethe 1808/1988) and the species (Csikszentmihalyi and Larson 1984). At present, however, youth tend to flounder in this area. The incredible rate of growth in the prevalence of children and adolescents classified as having ADHD (Bloom and Dey 2006) reflects, among other things, the inability of large proportions of children to control their urges, appetites, and distractions.

Increasingly, it's not so much motivation that's a problem, as much as *attention*. However, in the language of the will, the problem is that one's will becomes jerked around by a large variety of forces—some genetic, others societal—that compete very successfully for the attention of youth. Youth meanwhile fail at the task of *imposing their own will* from within, to have their own way, or what Csikszentmihalyi commonly refers to as controlling consciousness (Csikszentmihalyi and Larson 1984; Csikszentmihalyi 1990). Children who struggle to master their will are, deep down, grateful to adults for restricting TV or recreational options, or otherwise imposing structure to make their world smaller, as doing so facilitates a focusing of psychic energy difficult to achieve independently.

One of the most essential ways to help “train the will” is to provide it with choices and guided practice at making those choices. This includes choices in activities, choices in repairing relationship problems that arise, and, most critically, choices in how one should spend one's time. The observation that the average person has little insight into who he is and what he wants may never have been more true than for youth today (Schneider and Stevenson 1999).

Equipping the Will

Einstein recognized that fear and coercion are counterproductive for equipping the will, and understood what the important ingredients for equipping it actually are. Despite the fact that founding theorists of intrinsic motivation claim to be the first to classify qualitatively different *types* of motivation (as opposed to considering only the *quantity* of motivation, i.e., how much motivation someone has), Einstein, a proficient scientist himself, classified motivations into three main types back in 1936 along similar lines that they have been categorized since:

Behind every achievement exists the motivation which is at the foundation of it..... The same work may owe its origin to fear and compulsion, ambitious desire for authority and distinction, or loving interest in the object and a desire for truth and understanding, and thus to that holy curiosity which every healthy child possesses, but which so often is weakened early. (Einstein 1954, p. 61)

Not only did Einstein recognize these different types of motivation, but his writings reflected the belief that *the quality of the achievement is determined by the quality of the motivation*.

The first type of motivation was one with which Einstein was certainly familiar as a result of his own early education in strict, regimented German schools, but he held it as the least productive motive:

To me the worst thing seems to be for a school principally to work with methods of fear, force, and artificial authority. Such treatment destroys the sound sentiments, the sincerity, and the self-confidence of the pupil. It produces the submissive subject. (Einstein 1954, p. 61)

Although modern American schools are mostly free from fear of physical punishments that existed in Einstein's day, many students obviously suffer the consequences of this most destructive motive. Fear is inherently destructive because it drains the organism of the psychic energy better invested in the learning itself. Sometimes students manage to create their own fear and compulsions, though often it is produced through interaction with parents, peers, and teachers. Fear and anxiety of school failure are still very real and common symptoms of the "one best system" (see Chap. 5 for examples).

Einstein's remarks about the second motivation, ambition, are best characterized as ambivalent. He recognized that the desire for recognition and approval "lies firmly fixed in human nature" and "is one of the most important binding powers of society." However, he also cautioned that "the desire to be acknowledged as better, stronger, or more intelligent than a fellow being or fellow scholar easily leads to excessive egoistic psychological adjustment, which may become injurious for the individual and for the community" (Einstein 1954, p. 62). Here, Einstein recognized that the highly motivated but unprincipled person may be far more destructive than an unmotivated one.

In educational settings, the consequences of excessive ambition are reflected in the majority of high school students who admit to cheating over an academic year (Yazzie-Mintz 2007). In institutions of higher education especially, there are widely reported occurrences of theft and destruction of others' intellectual property, and consequently, careful taking measures to protect one's ideas or work. In elite academic circles, the need for greater and greater recognition in one's field has been likened to a sickness (Nakamura and Shernoff 2009). Of course, ambition based on the sort of Social Darwinism where "might makes right" is a completely natural and adaptive response to a competitive environment. Because this poses a risk of creating an amoral free-for-all, however, Gardner et al. (2001) recognized the moral imperative for our future leaders to be not only the best and brightest, but also ethically responsible. Guiding the younger generation to do "good work," that is both excellent and ethical is therefore one of the more important functions that parents, teachers, and mentors can serve (Nakamura and Shernoff 2009).

Einstein argued that the cooperative tendencies of humankind were more essential in its struggle for existence than competitive ones, and he urged educators to guard against the extolling of "success" (in the common sense of the world) as the default aim in life:

For a successful man is he who receives a great deal from his fellow men, usually incomparably more than corresponds to his service to them. The value of a man, however, should be seen in what he gives and not in what he is able to receive. (Einstein 1954, p. 62).

"The most important motive for work in the school and in life," according to Einstein,

is the pleasure in work, pleasure in its result, and the knowledge of the value of the result to the community. In the awakening and strengthening of these psychological forces in the young man, I see the most important task given by the school. Such a psychological

foundation alone leads to a joyous desire for the highest possessions of men, knowledge and artistic-like workmanship. The awakening of these productive psychological powers is certainly less easy than the practice of force or the awakening of individual ambition but is the more valuable for it. The point is to develop the childlike inclination for play.... (Einstein 1954, p. 62).

Einstein consistently held this inclination towards sheer pleasure, marvel, or “holy curiosity,” as the foundation of all significant science art, culture, and even religion:

The most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science. Whoever does not know it and can no longer wonder, no longer marvel, is as good as dead, and his eyes are dimmed. It was the experience of mystery – even if mixed with fear – that engendered religion. A knowledge of the existence of something we cannot penetrate, our perceptions of the profoundest reasons and the most radiant beauty, which only in their most primitive forms are accessible to our minds – it is this knowledge and this emotion that constitute true religiosity; in this sense, and in this alone, I am a deeply religious man (Einstein 1954, p. 11).

Einstein maintained that the “strongest and noblest motive” for scientific research in particular, including his own, was what he referred to as “the cosmic religious feeling,” very similar in nature to those of religious leaders (Einstein 1954, pp. 38–40). Einstein attempted to elucidate:

(The scientist’s) religious feeling takes the form of a rapturous amazement at the harmony of natural law, which reveals an intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is an utterly insignificant reflection. This feeling is the guiding principle of his life and work, in so far as he succeeds in keeping himself from the shackles of selfish desire. It is beyond question closely akin to that which has possessed the religious geniuses of all ages. (Einstein 1954, p. 40).

As much as many educators may agree that the passion to wonder and marvel, or the development of that “holy curiosity,” to use Einstein’s words, is among the highest educational ideals, where are the seminars, workshops, courses, and books for teachers and administrators on how to awaken this passion in individual students? Although there have been a number of theories and principles of motivation studied extensively by scholars and researchers over the past 50 years, what is most lacking are the models that show educators how students can be motivated and engaged in actual practice. Several empirically based models that educators can consider are the focus of Chaps. 10–14 of this book.

The most important educative influence on youth, more powerful than formal schooling, thought Einstein, may be thought of as the school of life—including one’s relationships and interactions with parents, friends, and other associates. At least this was certainly the case in Einstein’s own life. With most of Einstein’s formal schooling more than disappointing, it was his meaningful relationships with meaningful others that provided the enriching context for his intellectual development leading directly to his theories. These relationships included that with his father, whose gift of a magnetic compass fired Albert’s imagination about the physical world; his uncle, who modeled for him the fun and wonder of mathematics;

a medical student, who brought him a set of books on nature that ignited his interest and wonder in the natural universe as a boy; a gymnasium teacher, who awakened Einstein's love of literature, especially the work of Goethe; and a mathematics teacher, who provided him with an affidavit certifying that he was equipped to do college work after he had dropped out of high school (i.e., gymnasium), in contrast to the several who told him he would never amount to anything (McMillin n.d.).

As a good deal of recent research illustrates, engagement and motivation frequently blossom in the context of a relationship between a particular student and teacher, each with their own unique strengths, limitations, emotions, idiosyncrasies, and personalities. This is the focus of Chap. 7. Einstein believed the teachings embedded in such relationships preserve our culture:

It is not enough to teach a man [sic] a specialty. Through it he may become a kind of useful machine but not a harmoniously developed personality. It is essential that the student acquire an understanding of and a lively feeling for values. He must acquire a vivid sense of the beautiful and the morally good.... These precious things are conveyed to the younger generation through personal contact with those who teach, not—or at least not in the main—through textbooks. It is this that primarily constitutes and preserves our culture (Einstein 1954, p. 66–67).

As Csikszentmihalyi (1996) found in his study of creative adults, the type of work that moves forward any given field is usually based on a profound love and enjoyment in one's work. Einstein observed that work of this type is often but wrongly attributed to work ethic and discipline. Einstein believed that it is rather derived from the state of mind like the lover or worshipper—that it comes, “straight from the heart” (Einstein 1954, p. 227). Although one of Einstein's phrases has now been popularized to the point of cliché, it is still worth recognizing that he held imagination to be more important than knowledge. For Einstein, imagination was the driver of personality (indeed, it is what differentiates it from mere intellect); the creator of dreams, callings, and one's envisaged purpose (what Harvard Psychologist Robert Coles 1989, referred to as the “moral imagination”); and a prerequisite to human progress.

What educational approach does Einstein's philosophy imply more specifically? When commenting on what teaching methods are the best, Einstein stated that particular techniques are “of secondary importance.” (Einstein 1954, p. 62). What was important was that schools *demand* of teachers “to be a kind of artist in his province,” giving them the freedom to choose methods and select materials needed to meet this expectation (Einstein 1954, p. 63). He also opposed the idea that schools need to directly provide specialized knowledge for later accomplishments. Both he and Dewey emphasized that specialized training has the serious shortcoming that future conditions change, which can render specific techniques and specialized knowledge obsolete. In fact, the only certainty with respect to the future is that change is inevitable. Finally, in keeping with Dewey's emphasis on “learning by doing,” Einstein advocated teaching methods that urge students to actual performance as opposed to passive appreciation or onlooking.

Constructivist Principles of Learning (and the Lack of Implementation)

As we have observed, Dewey wrote much to advance the argument that a liberal democracy should generate aims of education based on the needs of individuals. It was mainly due to this belief that Dewey (1974/2000) suggested that educators needed to be well versed in the science of the mind and human development, and although he experimented with this ideal at the Lab School he founded at the University of Chicago, he also admitted one problem: Early in the twentieth century, there were few established psychological principles of which to speak. Nearly a century later, we have learned a great deal about human cognition, behavior, motivation, and how humans learn best through a large stockpile of empirical research and related theory. In 1993, The American Psychological Association created a task force to synthesize this significant body of research and theory into tangible principles for educators, resulting in the *APA Learner-Centered Principles* (American Psychological Association 1997; see <http://www.apa.org/ed/lcp2/lcp14.html>).

As explored in Chap. 3, we know a lot about motivation in particular. A long history of research on *intrinsic motivation*, or being motivated to perform a task for its own sake, has largely supported Einstein's view that "pleasure in the work" carries many advantages in terms of learning, creativity, conceptual understanding, and continuing motivation; or you could say that his motivations of fear and ambition carry many disadvantages in these regards. There is now decades of research on what undermines and promotes intrinsic motivation. Deci and Ryan's (1980) theory of *self-determination* highlights what every good teacher and parent eventually learns: The autonomy of the learner is absolutely key to motivation. Any sort of compulsion is—psychologically speaking—close to a physical forcing in terms of its negative effects on intrinsic motivation or self-motivation (Deci 1996).

Especially compared to Dewey's day, it seems as though we have more theories, more research, more knowledge, more experience, more modalities, more materials, and much more technology to motivate students than ever before. So: *why aren't our schools working any better to engage youth?*

There is in fact a great agreement about key principles and conditions under which humans learn best. Much of contemporary theory in educational psychology view humans as active constructors of their cognitive worlds, and stress the importance of teaching them in a manner consistent with this image (e.g., Brown and Campione 1994; Brown et al. 1989; Paavola et al. 2004; Palincsar and Herrenkohl 1999; Rogoff 1990, 1995, 2003; Scardamalia 1989; Zhang et al. 2009; see Stone 1996 for one example of an alternative opinion). There is also much agreement that schools have serious problems in doing so. The wide ocean of difference is thus between how we know humans learn and how students are still asked to learn every day in schools. Despite this recognition and the better efforts of decades of reformers, schools *as a system* of education seem utterly immune to change. In fact, research suggests that there has been little or no increase in cooperative learning, active learning, and teacher–student interactions between 1983 and 1997, despite a

great deal of research in educational psychology from 1960 to 1980 suggesting that the quality of instruction would be greatly enhanced by these effective but underutilized practices (Koljatic and Kuh 2001). Why should it be that the significant knowledge produced about human learning has little or no effect on educational practice?

Coming to Grips with the Research–Practice Divide

Dewey wrote about one important reason extensively. Seemingly no less true today than in his time, he argued that schools are so set apart and isolated from the ordinary conditions and motives in life that the lessons students come to learn offer only an “abstract and remote reference to some possible living to be done in the future” (Dewey 1900/1990, p. 18). According to Dewey, all waste in education is due to this type of organizational isolation (p. 64).

The second reason that our increase in knowledge has not appreciably changed practice is that the knowledge is *difficult to implement*—especially in large classroom settings. Most teachers, and especially the good ones, value the learning of each individual in their class and individualized approaches in line with the philosophies of Einstein, Dewey, and the APA Learner-Centered principles. What student, or teacher for that matter, wouldn't prefer individualized tutoring as a more ideal learning environment than the large class setting? In a tutoring environment, these principles that rely on an individualized approach come naturally. However, as soon as one, two, three, five, or eight more students are added to the mix, individualizing instruction becomes inconceivably harder—let alone *twenty-five* more. Thus, even the teachers who most *value* these principles struggle to *implement* them.

Based on extensive observations of elementary school classrooms in his classic work *Life in Schools*, Jackson (1968) argued that learning is more in the periphery than the focus of a typical school teacher's vision when interacting with students in a typical classroom. Intellectually, learning may presumably be the goal, but in reality this goal becomes blurred. This imprecision of goals may become understandable when considering the number of classes in the curriculum and the number of students in each class—specifically, 25–30 students for roughly 1,000 h per year.

In another classic work,Sizer's (1984) *Horace's Compromise*, sheer numbers were also the paramount consideration when characterizing the work of teachers. Sizer believed that the overwhelming demands placed on teachers in terms of the number of students and classes inevitably make even sincere teachers compromise their ideals in terms of how much individualized attention they can provide each student (e.g., how much time can be spent on reviewing each student's paper). Sizer's fictitious but representative teacher, Horace, found himself continually compromising his well-intended ambitions to visit other classes within his department, set up meetings with students' parents, read within his field, and other like professional development activities. For teachers as well as students, the name of the game during a busy semester is usually *survival*. Often one of the best survival strategies

a teacher has is to keep students as busy as possible—a strategy that makes the primary goal *managing* rather than learning or motivating.

To demonstrate the diffusion of a teacher's goals and attention around instruction, Jackson uses the analogy of a mother's concern for the nutrition of her children when making dinner for a large family. The mother understands intellectually that the biological purpose of eating is nutrition, which has a strong relation to a child's health. She also understands that her children may have different dietary needs and desires. But the nature of the task requires that she puts on a single meal to be shared by the entire family, in which a variety of other variables become salient: for example, cost, convenience, aesthetic quality, and taste. Her own taste may be the greatest influence on judgments of taste or preference. Given time constraints, the first priority inevitably becomes doing everything that she needs to do *in the time that she has*: preparing enough food, but not too much, and preparing enough items of sufficient variety to increase the odds that every child can eat *something*. The meal itself is a social activity as much as a nutritive activity. After the necessary clean up, only in exhaustion *might* she get to a reflective place with enough leftover attention to consider the nutrition of each child, *perhaps* informing her next meal. Thus, in actual practice, attention to what individuals are learning is constantly tempered by, if not abandoned for, primary allegiance to the necessities of the whole class within the institutional constraints of the school.

Due to the increasing recognition that quality education is individualized, *differentiated instruction* (Tomlinson 1995, 1999) has become extremely popular among teachers in recent years. In differentiated instruction, teachers understand that their students learn differently. They use different modalities to appeal to the diverse interests of individual students, using varying rates and complexity of instruction to accommodate varying degrees of intellectual readiness. Students may compete against themselves rather than other students. Each student is provided with an individualized roadmap for deep learning. Because students are not fit to a standard mold, it is necessary for teachers to become astute observers and diagnosticians of each student. Teachers become the artists that Einstein envisioned, using whatever techniques are necessary to recognize and reach their students as individuals (Tomlinson 1999).

Not surprisingly, however, differentiated instruction is difficult to achieve. The more differentiated and interactive a classroom is, the more complex it becomes. If each student has a distinct learning profile, then ongoing assessment of each student is also needed. There must also be provisions to offer each student meaningful choices, make academic work meaningful for each student, and to plan for the unique learning styles and optimal levels of challenge for each students' level of ability—all very much as the APA Learner-Centered principles would have us do. Needless to say, changing the methodology for every child on a continual basis is a highly challenging skill, requiring a high level of interaction between teacher and students. Thus, it is an understatement to say the best methods are often the most challenging ones. They are impossibly challenging without specialized training for most teachers, and even if properly trained, many teachers might soon burn out from the level of effort involved. However, there are also reasons for believing that the

problem of satisfying the learning needs of individuals in large numbers is not impossible to solve. Key principles for reaching this challenge are provided in Chaps. 6–9 of the book, and the models illustrating how these principles can be effectively implemented are provided in Chaps. 10–14.

Tyack reminds us that the entrenched division between researchers and teachers on the one hand, and practicing teachers on the other, was historically an inherent part of the “one best system.” Both John Dewey and his replacement at the Chicago Lab School, Charles Judd, proposed science as a new method of improving education. Thorndike also believed that scientists or “experts” should discover the best methods to teach, and teachers should implement them. From the beginning of this system to the present day, however, teachers have generally been unaware of the work of scientific researchers. Even if they were interested in it, taking the time needed to absorb it would merely be one more item on Horace’s neglected professional development list. The same large gulf between teachers and researchers is evident in the present day, perhaps becoming even wider. Despite scientific advances, the process has little effect on standard teaching practice (Stigler and Hiebert 1999).

Reeve (2009) took a specific scientifically recommended practice—to support the autonomy of students—and provided several reasons that the recommendation has been so inconsistently implemented in the practice of teaching. These included the power differential between teachers and students, the need for teachers to control or manage students, and teachers’ lack of comfort with losing control. As valid as these barriers may be, another important and seldom considered source of separation relates to the professional relationship between researchers and educational practitioners: *Specifically, teachers and researchers are generally not essential stakeholders in each others’ work.* A more productive relationship between researchers and practitioners must be forged to include shared goals and optimal information exchange in order to be mutually beneficial. Ideally, research and practice would create an authentic partnership in pursuit of community-level goals.

Axioms from the Perspective of Social Psychology, Sociology, and Evolution

With historical and philosophical axioms have already been introduced, some social–psychological and sociological axioms now also emerge. A social–psychological axiom relates chiefly to the primacy of interpersonal relationships as a context for fostering youth engagement. While this may seem like an obvious principle, classic theories of motivation have sprung mainly from the discipline of psychology, in which motivation is conceptualized as an individual psychological drive rather than a shared interpersonal process. Only within the last ten years or so has research on the influence of interpersonal relationships (as distinct from “relatedness” conceptualized as one component of an individual’s psychology) been seriously considered as an important influence on engagement with learning—but

within that time, research findings have consistently suggested the importance of supportive interpersonal relationships as context for engagement. This is the topic of Chap. 7, and is further illustrated in several of the empirically based models presented in Chaps. 10–14.

The sociological axiom relates to the fact that schools are only one component in the overall structure of modern society. A major problem of engagement in schools is a direct function of a societal organization that sorts individuals into economic winners and losers. Our schools reflect this organization, and, indeed, formal schooling marks the beginning of this sorting function for most people. Chief mechanisms include grading, tracking, and admissions systems, which have proven to provide disproportionate advantages to the well-to-do, resulting in a significant and persistent achievement gap (Carbonaro 2005; Carbonaro and Gamoran 2002; Gamoran and Mare 1989; Hallinan 1996; Oakes 1985, 2000; Oakes et al. 1992). The present educational system is designed such that significant percentages of students land on the bottom of a bell-shaped distribution of unidimensional measures of “achievement,” for example, performance on standardized math and English exams. When students are sorted into winners and losers on a mass scale, the psychological, motivational, and economic effects on the losers can be profound, and there are also a number of adverse motivational effects on the so-called winners. This topic is significantly expanded in Chap. 5.

One need not contemplate the function of school in society for long before coming to an even broader consideration, amounting to one of the core philosophical questions humans face—that of what *should* be the purpose of society, or even the purpose of life. While obviously a question beyond the scope of this book, it is still worth suggesting that purely economic, capitalistic, and imperialistic goals represent a purpose far too narrow for a huge number of people. When searching for the larger purpose of humankind in general, a principle is needed that encapsulates the development of the entire species. Such is a process of human evolution. Humans have evolved and will continue to evolve in one direction or another, the direction of that evolution thereby becomes among the most fundamental and significant of collective human activities, whether consciously aware of this activity as a larger purpose or not. A culminating phase of human evolution at present is the development of the complex human personality (Novak 2009), not far from Einstein’s conceptions of “harmonious personality,” “soul,” or “will,” as opposed to mere intellect.

Some experiences nourish personality or “equip the will” more than others. As one example, championed by my earlier mentioned high school English teacher, McMillin, the study of classic novels and their protagonists helped certain individuals to transcend a less rich environment, transporting them into an enlarged world of human capabilities and possibilities. Once inhabiting that world, these individuals could decide for themselves how much they wanted to live like Odysseus, Faust, or Huckleberry Finn. The values or morals absorbed from such an experience were only the latest occurrence of a process of cultural evolution, as they had been handed down from one generation to the next before this. These *memes*, or building blocks of cultural evolution, make up an inherited culture. Thus, education has a pivotal

role in the direction that the prevailing *culture* evolves (Nakamura and Shernoff 2009; Martin 2011). For both biological and cultural evolution, therefore, the most important investment a society can make is in the *individual humanity*¹ of its citizens, to borrow the phrase after which McMillin named his course, reflecting his life's work.

Humans evolve as our consciousness evolves, bringing us ever closer to a fuller perception and understanding of reality or the universe or divinity. There is no reason to believe that our present level of consciousness is any more than very partially evolved compared to a later stage in evolution. I would use the following analogy. We can imagine that the various animals have different levels of consciousness, especially as their anatomy limits their perception of reality. For example, the consciousness of a relatively intelligent animal like a chimpanzee may be mostly similar to that of humans, but it lacks several bio-evolutionary capacities (e.g., metacognition, moral reflection, or advanced problem solving) that humans have developed, as well cultural knowledge such as an awareness of history and the physical universe. The consciousness of an ant or a bee may be much more limited by virtue of even less developed bio-cognitive capacities and cultural capital, and the consciousness of a microbe or other less complex life forms may be more limited still. Unless we believe that human kind in its present form is the endpoint of all evolution, which would appear to be an extraordinarily vain belief, there is a much fuller perception and understanding of reality that is not yet known to us. Both bio-evolutionary and cultural evolutionary advances would appear to be activities of great import to the human species. Even if only vaguely understood, an investment in the individual humanity of our citizenry through educative experiences will build on both processes. Engaging youth is the high octane fuel of inevitable educative processes that nurtures individual humanity in support of human evolution. What weighs in the balance is not only the speed of human evolution but also, more importantly, its direction.

Conclusion

Student engagement, like all educational issues, must be considered with reference to the aims of education. Schools are in a unique position to facilitate students' engagement to learn. Einstein's formulation of training individuals to exercise powers of independent action and thinking in service of the community is both positive and generative. Consistent with conceptions of Positive Youth Development (e.g., Lerner 2004), it supports a vision of youth engagement as one of making positive contributions to the self, others, and civil society. It also may be helpful as educators attempt to fill a void in terms of a larger sense of purpose experienced by many youth (Damon 2008). It can also help to ameliorate the growing sense that

¹"Individual Humanity" borrows the phrase after which my revered high school teacher, Laurence McMillin, named his course that embodied his life's work.

individual achievement is the ultimate goal not only in school but also in life. Rather, educators may come to understand one of their most important functions as identifying and supporting youths' future directions and sense of mission based on their strengths, interests, and values.

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