



Turning Learning  
Right Side Up:  
Putting Education  
Back on Track

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# I

Education should be a lifelong enterprise, a process enhanced by an environment that supports to the greatest extent possible the attempt of people to “find themselves” throughout their lives.

For too long, we have educated people for a world that no longer exists, extinguishing their creativity, and instilling values antithetical to those of a free, 21st century democracy. The principal objective of education as currently provided is to ensure the maintenance and preservation of the status quo—to produce members of society who will not want to challenge any fundamental aspects of the way things are. Traditional education focuses on teaching, not learning. It incorrectly assumes that for every ounce of teaching, there is an ounce of learning by those who are taught. Being taught is, to a very large extent, boring, and much of its content is seen as irrelevant. It is the teacher, not the student, who learns most in a traditional classroom.

Without motivation, no amount of teaching can produce learning. Motivation comes from within, not from without—it can not be imposed on students. With motivation, young students and adults learn, and they do so by means they select. Most of what we learn before, during, and after attending schools we learn without it being taught to us. For example, some schools have done away with reading instruction altogether; these schools allow children to acquire that skill when they seek it on their own. They eventually do, some at age 4 and some at age 12. Reading disorders are extremely rare in such schools. In the old one-room schoolhouse, the students taught each other. The teacher was a resource that students could call on when they wanted help.

Mass education was explicitly developed to mold naturally unruly children into compliant, obedient young people. Inspired by the Industrial Revolution, schools were, and still are, designed and operated as much like factories as possible. Incoming students are treated as raw material to be

processed into saleable products. Creativity is actively suppressed, and in most schools conformity—which is anathema to creativity—is valued instead.

In addition, schools are obviously run more for the benefit of those employed in the system than to enable students to learn. Teachers, like employees in any system, try to ensure their job security by requiring students to be taught subjects they, the teachers, know. The explosion in the number of employees working in the educational system is awesome, and worrisome. It would appear at first blush that, given the finite number of children in schools, the number of people employed in the system would be limited. Not so. Here is a sample of the ways used to continually expand employment in the system.

- Reducing class sizes.
- Adding subjects into curricula.
- Monitoring the “effectiveness” of teaching through frequent testing at every level, and “research” based on test results.
- Increasing the number of students who fall below the desired level of achievement using test scores; hence, increasing “remedial” education.

Educators and educational planners spend a good deal of time deciding what subjects students should be taught. This activity is based on the assumption that they know what students are going to need to know when they finish their schooling. This assumption is false for two reasons: a very large proportion of students will not practice in the field for which they were educated, and because the rate of innovation is constantly increasing. What they learn in school is made obsolete more and more quickly with the passage of time.

Most classes, curricula, and schools are currently organized around disciplines. As a result, students come out of school believing there are such things as physical problems, chemical problems, biological problems, psychological problems, social problems, economic problems, distribution problems, and so on and on. *Problems do not fall into disciplines.* Those facing problems do; therefore, a discipline tells us about the point of view of the person looking at the problem. The same problem is generally seen differently by persons who are identified with different disciplines. The best way of treating a problem cannot be determined without looking at it from as many different disciplinary perspectives as possible. Problems do not “belong” to any discipline. Nevertheless, those that identify a problem generally try to solve it by manipulating the variables with which their discipline is familiar.

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The distinction made between science and the humanities (which include the arts) probably does the most harm. The fact is that science and the humanities are two sides of the same coin, different aspects of the same thing. They can be viewed and discussed separately, but they cannot be separated. Science engages in the search for similarities between objects and events that are apparently different. The arts and humanities consist of the search for differences among objects and events that are apparently similar. Actually, one the best kept secrets of our time is that the distinction between science and art is wholly nonexistent. Every significant development in modern science

can be traced directly to a fantasy that defies common sense and seems absurd. The list is endless: take, for example, Copernicus's notion that the Earth hurtles through space and spins on its axis, and Einstein's notion that all space is curved and inextricably linked with time.

The truth is that every child has his or her own highly specific and original way of growing up. To deny this diversity is to deny the very existence of individuality.

Much of our formal education focuses on problems and problem solving. It fails to reveal that problems are abstractions extracted from experience by analysis. Reality consists of sets of interacting problems—messes. Students are seldom taught or learn how to deal with messes. Instead, they are given exercises to “solve.” Exercises are abstracted from problems, themselves an abstraction; they leave out the information required both to formulate the problem and to solve it. They are purposeless problems. Questions often leave out the information required to understand the context of the problems from which the questions are an ultimate abstraction. For example, the answer to the question: “How much is  $2 + 3$ ?” depends on the context of the question, “Two plus three of what?” The answer will differ depending on whether we have in mind degrees Fahrenheit or Celsius, logarithms, or books on a table. Worse, creativity is suppressed in schools in which students learn to provide teachers with the answers they expect.

In the world outside the classroom, examinations are seldom used to determine the competence of a person. We evaluate people by what they can do and how well they can do it, not by such test scores as are currently used to set “standards.” The use of such standards in schools is based on the assumption that children undergo the same developmental process, at the same basic rate, from birth until maturity. The truth is that every child has his or her own highly specific and original way of growing up. To deny this diversity is to deny the very existence of individuality. Perhaps the most devastating effect of standardized testing is degradation of many children who deviate from the testers’ idea of the norm. Tests rob most of them of their childhood, strip them of their self-esteem, instill in them a lifelong distaste for anything academic, and create in them a well-deserved distrust of all adults. No wonder so many students look on the testing to which they are subjected with disdain.

## II

Learning involves five types of input to the human mind: data, information, knowledge, understanding and wisdom. The five types of content form a hierarchy of value. Data are symbols that represent the properties of objects and events. Information consists of data processed to be useful, and it is contained in descriptions. Knowledge is contained in instructions, answers to “how to” questions. Understanding is contained in explanations—answers to “why” questions. Wisdom is contained in evaluations. It is imbedded in knowing the difference between doing things right and doing the right thing.

Formal education at all levels focuses on the least valuable inputs, data, and information. Only recently has attention been given to knowledge. Understanding and wisdom continue to be left out; few even learn in school what these consist of. It is wisdom that we should seek more than anything else—the ability to make value judgments, to know the consequences of our actions, and to learn from our mistakes. Almost all of the prevailing social problems in our society consist of trying to do the wrong things better. The better we become doing the wrong thing, the “wonger” we become. When we correct a mistake while doing the wrong thing, we become “wonger.” When we correct a mistake doing the right thing, we become “righter.” Therefore, it is better to do the right thing wrong than to the wrong thing right, because we can learn from the former. Exams are used to make students perceive mistakes as bad things, to be avoided or hidden. However, one never learns by doing something right; all one can get out of being right is confirmation of what one already knows. This has value, of course, but not as much as learning from one’s mistakes.

The major opportunities for learning come out of identifying mistakes and correcting them. If learning were the objective of schools, they would repeat examinations—after they have been given the first time—to see to what extent mistakes previously made have been corrected. The avoidance of taking responsibility for mistakes, induced by schools, carries over to most employing organizations.

There are two types of mistake an employee can make in such organizations: doing something that should not have been done, an error of commission; and not doing something that should have been done, an error of omission. Most students are unaware of the existence of *errors of omission*. These are much more serious than *errors of commission*. However, accounting systems record only errors of commission. Therefore, these are the only kind of mistake an employee can be held responsible for. To minimize chances of being held responsible for errors of commission—where errors of omission are not recorded—the best strategy is to do nothing. This is the source of the conservatism and risk aversion that permeates the current educational system and society.

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### III

Complex problem solving is natural to children. From the moment of birth, nearly all their activity relates to a vast number of interrelated real-life problems. With each passing month the number and complexity of the problems they face increase—locomotion, communication, sanitation, dressing, etc. They are masters at using trial and error to solve problems.

Nature has provided every child with the key tool for becoming fully adept at finding his or her way in a world of increasingly rapid change. The magical tool provided by nature is *play*. Play involves an exploration of the unknown. Children do this with gusto. Play and learning are inseparable. In addition, play is an activity that brings joy and satisfaction just from engaging in it. The very *raison d'être* of educational institutions at all levels should be to provide an environment in which some form of play predominates.

Educational systems would be greatly improved if they granted freedom to all students of every age to follow their own unique path toward understanding, and to seek, on their own initiative, the intellectual tools (even play) they find most congenial. There is little reason to doubt that students so occupied will master different patterns of thought and pursue a wide range of problems.

Such an environment would foster every child's normal creativity, and the consequent development of an adult population that is inquisitive, original and innovative.

The impact of education on a child depends, in part, on what the child brings to the process. Among the most important contributions of the "student" are curiosity, character, passion, determination, confidence, and the abilities to contemplate and communicate. However, these traits can be subdued and even submerged by what is done to them in the educational process. Students are often prevented from pursuing their interests or *even* from asking questions they may have. They learn early

that the only permissible questions are ones for which their teachers have answers. They cannot ask, or if they do, discuss possible answers to such questions as: “Why is God an old man?” “Why is monogamy desirable?” “Why can’t children divorce their parents?”

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It is during their preschool years that children engage in the most intense and comprehensive learning of their entire lives, and nearly all of it is self-initiated and self-motivated. They receive little help from the adults who act as “teachers.” Their learning ability is maximized by using the child’s insatiable thirst to grow up and become a functioning adult. There are many ways that society curbs children’s self-directed activity and replaces it with adult-controlled behavior. We, the authors, believe that every person will develop in his or her own individual manner as completely as possible. From our point of view, not only is it nature’s scheme that each child strives to mature in a unique manner, but it is also our obligation to do everything we can to encourage this and not try to replace the child’s striving with ours. To allow children to engage in self-initiated activities to their heart’s desire is to allow them to realize their fullest potential as human beings. Therefore, it is hard to understand why educators and child development specialists advocate systems for coercing children, against their clear inclination and will, to curtail these activities in favor of an externally imposed adult agenda. They fail to understand the difference between *managing* children and *leading* them.

To manage others is to direct them in the pursuit of objectives using means which the manager selects. To lead others is to guide them in the pursuit of objectives by the use of means the followers as well as the leader select. The followers of a leader always do so voluntarily; not so for the followers of a manager, particularly not for managers who command. Leadership, unlike management, requires talent and therefore is an art. One can be taught to draw or be a manager, but one cannot be taught to be an artist or a leader. Leadership can be enhanced by education, but not created by it. To lead children is to enable them to pursue objectives by means they participate in choosing. Obviously, few schools do this. The most important single thing for children to learn is to be independent—to learn about themselves and their environments on their own. Setbacks may get them frustrated, but that's something to be encouraged. It is good for them to be the prime movers, and to be able to express freely their reactions to their various experiences.

# IV

In general, schools do not take into account the fact that there are three root ideas underlying the ethical, political, and social structure of the United States.

1. Every person is endowed with certain “inalienable rights,” rights that belong to people as their own, and not given to them by an external authority.
2. All decisions governing a community are decided by the community in a democratic way. That is, all those affected by a decision should be able to participate either directly or indirectly (through elected representatives) in making it.
3. All individuals share equal opportunities. This provides everyone with an equal starting line, and where they go from there depends on them—their abilities and desires, among other things.

Students in our schools, from pre-nursery to postgraduate levels, have virtually no individual rights. They have no right of free speech, no right of dissent, no right of peaceful assembly, no right to confront their accusers, no right of privacy, and so on. Does anyone really think the way to prepare people for the responsible exercise and jealous guardianship of their rights in the United States is to raise them in an environment devoid of these rights? Our educational system is the only major institution in our country that officially recognizes autocracy (in contrast to democracy) as its principle type of government. Each level of an autocracy has almost unlimited control over the level below it, the students being at the bottom. There is nothing they decide to do that can't be undone by a higher authority. The absence of equal opportunity in our schools for all segments of our population is well known. Equal opportunity means that every student expressing a wish to pursue a particular course is given a chance to try it. The arguments against granting full civil rights to children and empowering them to govern their own lives have no basis in experience. There is ample evidence that children are quite capable of being full citizens in a free society. This has been demonstrated in a number of pioneering schools.

# V

From our discussion it can be seen that the ideal school environment for young people to become educated in should have the following characteristics:

- Learning takes place through self-motivation and self-regulations.
- Equal status is given to all interests.
- The output of learners is judged through self-evaluation, a concept that includes the freedom to seek outside feedback.
- Learning groups form based on common interests.
- No artificial distinction is drawn between learners and teachers.
- All members of the learning community participate fully in regulating its activities.

Such a school is permeated with an atmosphere of comfort, self-confidence, and bustle. Given the freedom to fail without censure, students will often challenge themselves to work hardest on their weaknesses. Although there is no set curriculum, such a school develops in students many valuable tools that prove their usefulness when they reach adulthood. In addition, students at such a school will be well prepared to function as citizens in a democratic society. Undergraduate programs in colleges and universities have become extensions of traditional high schools. All the failings we have attributed to K-12 schools apply equally to these institutions. Colleges appear to be serving the primary social function of keeping young people out of the workplace for an additional four years and enabling them to continue to exist without the need to participate as full members of the larger adult society.

Undergraduate studies should focus on areas of intrinsic value (not instrumental value) to students—studies that are pleasurable, not studies of extrinsic value (usefulness) that require practice. These programs should encourage creativity and enable students to continue learning *how* to learn and to be motivated to do so. There should be no entrance requirements to undergraduate education. There should be exit requirements, but only when students want certification of an expertise in a selected area of study. By contrast, the function of graduate education should be the development of practitioners of professions. Practices are activities that can only be learned by engaging in them, such as law, medicine, and architecture. Here also there should be no prerequisites for entry, but there should be exit requirements—a demonstration of an ability to practice effectively and responsibly in a chosen field. Students should design their own educational programs without being constrained by “requirements.” Their designs should be reviewed by experienced practitioners.

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Students may or may not use the feedback from faculty members, but they should be required to defend their choices when their designs are presented for review. Programs should be based on practice supplemented with opportunities to consolidate (in self-organized discussion groups) the learning obtained from it. Practice should be carried out under real, not simulated, conditions under the guidance of an experienced practitioner. Graduate programs should be governed by a committee consisting of all those directly involved in them. All faculty members should have the same rank and title. This is intended to make each program a classless society. It will reduce

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the political maneuvering that currently occupies so much unproductive time of faculty members. Adults who have already pursued a career in one field and want to change to another will turn to these graduate schools for “retraining.” Although lifelong careers will doubtlessly continue to exist, we can expect more and more people to undergo several career changes during their lifetimes. As they do so, graduate schools will have an increasingly diverse age mix among students. Because of the rapid development of new knowledge and the rapid obsolescence of the old, adults past school age increasingly want further education for one or both of two reasons: they either want to increase their work-related competence, or engage in learning for its own sake, as an end in itself. Such “continuing education” should be conceptualized in a different way than for students not yet practicing in the real world. The “postgraduate” students in these programs should be active contributors to them. They should have abundant opportunities to compare notes on what they know, and what they believe they need to learn. Universities, technical schools and employers should provide “competence maintenance” programs. These programs would continuously survey developments in designated areas and report them regularly to subscribers, along with a list of sources for the acquisition of more detail.

New developments in technology make it possible to form common-interest groups and keep their members in continuous communication with each other. Graduate schools should be able to guide individuals into relevant learning networks. Because of a continually increasing life expectancy, there is no longer any upper limit to the age at which a person can participate fully in the intellectual and productive life of the community. For this reason, retired persons should be permitted to attend classes (if they are not filled) at no cost in any publicly-supported university or college. The presence of these older people in undergraduate and graduate classes would enhance the learning possibilities of the usual kind of students. There is no longer any need to retire at a specified age. It is likely that the concept of a “retirement age” will disappear in the human condition—or perhaps, more properly stated, society will welcome the return to an age-old practice of treasuring old age.



## VI

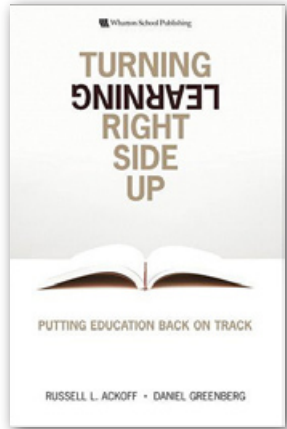
The number of groups engaged in totally redesigning education, and schools in particular, is growing and there is a great deal to learn from them. The best of these efforts are those in which the client population—the students—play a critical role. In fact, one is hard pressed to defend a process of redesign in which the client population for which the design is being prepared is ignored.

The environment in which education takes place has undergone profound changes, largely due to technological advances. Access to information and knowledge, speed of communication, and speed of travel have “shrunk” the world. These changes have had a great effect on how businesses and not-for-profit organizations work. They have had much less effect on how educational institutions work and what they teach.

The information age offers historically new opportunities for everyone. It is now possible for education to return to its initial meaning of finding a meaningful life for each individual within the context of the greater culture. In addition, now, for the first time in history, the greater culture is global and offers more opportunity for variety, creativity, and diversity than ever before.

Which brings us back to where we started: Education should be a lifelong enterprise, a process enhanced by an environment that supports, to the greatest extent possible, the attempt of people to “find themselves” throughout their lives. 📖

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