

What does Psychology Demand?

Selections from

Edward Thorndike

In this introductory chapter, Thorndike explains the ways that psychology can inform the practice of education. Specifically, he talks about the way that stimulus and response can be used to produce the desired changes in pupils.

The Teacher's Problem: The Aims, Materials and Methods of Education.

The word Education is used with many meanings, but in all its usages it refers to changes. No one is educated who stays just as he was. We do not educate anybody if we do nothing that makes any difference or change in any-body. The need of education arises from the fact that what is is not what ought to be. Because we wish our-selves and others to become different from what we and they now are, we try to educate ourselves and them. In studying education, then, one studies always the existence, nature, causation or value of changes of some sort. The teacher confronts two questions: 'What changes to make?'

The Ends and Means of Education

and 'How to make them?'

Reflection Question

is there good reason to remove the first question from the domain of the educator?

The first question is commonly answered for the teacher by the higher school authorities for whom he or she works. The opinions of the educational leaders in the community decide what the schools shall try to do for their pupils. The program of studies is planned and the work which is to be done grade by grade is carefully outlined. The grammar-school teacher may think that changes in knowledge represented by the ability to read a modern language ought to be made in boys and girls before the high-school, but the decision is rarely his ; the primary teacher may be obliged to teach arithmetic although her own judgment would postpone giving the knowledge of numbers until the fifth or sixth grade.

What changes should be made in human nature by primary, grammar and high schools and why these and not other changes should be the aim of the schools, are questions usually answered under the heading 'Principles of Education.' How most efficiently to make such changes as educational aims recommend, is a question usually answered under the headings 'Principles of Teaching,' or 'Methods of Teaching,' or 'Theory and Practice of Teaching,' or 'Educational Psychology.' This

The Ends and Means of Education

book will try to answer this latter question, —to give a scientific basis for the art of actual teaching rather than for the selection of aims for the schools as a whole or of the subjects to be taught or of the general result to be gained from any subject. Not the *What* or the *Why* but the *How* is its topic.

It is not wise however to study the *How* of teaching without any reference to the *What* or the *Why*. If a teacher does not appreciate, at least crudely, the general aims of education, he will not fully appreciate the general aims of school education; if he does not appreciate the general aims of school education, he will not fully appreciate the aims of his special grade or of any one special subject; if he does not have fairly clear ideas of what the year's work as a whole or of what each subject as a whole ought to accomplish for the scholars, he will not know exactly what he is about in any particular day's work. The teacher must be something more than the carpenter who follows without reflection the architect's plan, or the nurse who merely administers the physician's prescriptions. His relation to the administration of the school system and the program of studies is more like that of the builder who is told to make the best house he can at a cost of ten thousand dollars, using three laborers, a derrick and such and such tools and providing especially for light, ventilation and protection against fire. Superior authorities say, 'Make the best boys and girls you can, using arithmetic, geography, school regulations and so on, providing especially for knowledge, good habits of thought, worthy interests, bodily health, noble feelings and honest, unselfish conduct.' The builder must often study how to dig a foundation, how to erect a frame, how to lay a floor and the like with reference to what is to be built; the teacher should often study how to utilize inborn tendencies, how to form habits, how

The Ends and Means of Education

to develop interests and the like with reference to what changes in intellect and character are to be made.

Reflection Question

Is this construction metaphor accurate or is teaching more accurately described by another metaphor?

The teacher should know about educational aims and values as well as about such principles of teaching as directly concern his own activities in the classroom. The next three pages will accordingly outline the essential facts concerning the ideals which, in the opinion of the best qualified thinkers, should be followed in American education, and throughout the book due attention will be given to such facts about the ends the teacher should seek as he needs to know to improve his teaching.

The Aims of Education.— Education as a whole should make human beings wish each other well, should increase the sum of human energy and happiness and decrease the sum of discomfort of the human beings that are or will be, and should foster the higher, impersonal pleasures.

The Ends and Means of Education

Reflection Question

What kind of ethical framework can underly these aims?

These aims of education in general—good-will to men, useful and happy lives, and noble enjoyment—are the ultimate aims of school education in particular. Its proximate aims are to give boys and girls health in body and mind, information about the world of nature and men, worthy interests in knowledge and action, a multitude of habits of thought, feeling and behavior and ideals of efficiency, honor, duty, love and service. The special proximate aims of the first six years of school life are commonly taken to be to give physical training and protection against disease; knowledge of the simple facts 'of nature and human life; the ability to gain knowledge and pleasure through reading and to express ideas and, feelings through spoken and written language, music 'and other arts; interests in the concrete life of the world; habits of intelligent curiosity, purposive thinking, modesty, obedience, honesty, helpfulness, affection, courage\and justice; and the ideals proper to childhood.

The special proximate aims of school life from twelve to eighteen are commonly taken to be physical health and skill; knowledge of the simpler general laws of nature and human life and of the opinions of the wisest and best; more effective use of the expressive arts; interests in the arts and sciences, and in

The Ends and Means of Education

human life both as directly experienced and as portrayed in literature; powers of self-control, accuracy, steadiness and logical thought, technical and executive abilities, cooperation and leadership; habits of self-restraint, honor, courage, justice, sympathy and reverence; and the ideals proper to youth.

With respect to the amount of emphasis upon different features of these general ideals, the best judgment of the present rates of practical ability somewhat higher and culture of the semi-selfish sort somewhat lower than has been the case in the past. No sensible thinker about education now regards the ability to support oneself as a mean thing. Every one must gain power at school as well as at home to pull his own weight in the boat, to repay in useful labor what the world gives him in food and shelter. The cultured idler is as one-sided as the ignorant and clownish worker and may be even more of a danger to the world. The schools must prepare for efficiency in the serious business of life as well as for the refined enjoyment of its leisure.

The best judgment of the present gives much more weight than has been the case previously to health, to bodily skill and to the technical and industrial arts. The ideal of the scholar has given way to the ideal of the capable man—capable in scholarship still, but also capable in physique and in the power to manipulate things.

Very recently thinkers about education have dwelt more and more upon the importance of aiming not only to prepare children for adult life and work but also to adapt them to the life of childhood itself. Aim more to make children succeed with the problems and duties of childhood and less to fit them for the

The Ends and Means of Education

problems and duties of twenty years after; let education adapt the child to his own environment as well as to some supposed work of his later years—such are the recommendations of present-day theories of education.

In actual practice aims often conflict. A gain in knowledge may mean a loss in health; to arouse ideals may mean less time for drill in correct habits; in zeal for the development of love of the beautiful the interest in the dry, cold facts of science may have to be neglected. The energy of any teacher, and of scholars as well, is limited. All that can be expected is that none of the aims of school education shall be wilfully violated and that energy should be distributed among them all in some reasonable way.

The degrees of emphasis on the different proximate aims vary (1) with the nature of the individual to be educated and (2) with the nature of the educational forces besides the school which are at work. Thus (1) the emphasis in a school for the feeble-minded is not the same as in an ordinary school; the emphasis in a high school representing a selection of the more ambitious, intellectual and energetic is not the same as in a school where the selection is simply on the basis of the ability of the parents to pay tuition. (2) The emphasis in a primary school attended by the children of recent immigrants will differ from that in a school in a suburb inhabited by American professional and business families. A high school in a farming community in the Southwest should not pattern its ideals after those proper to a school in New York City.

Reflection Question

Is the previous paragraph a justification for oppression?

The Special Problem of the Teacher.— It is the problem of the higher authorities of the schools to decide what the schools shall try to achieve and to arrange plans for school work which will attain the desired ends. Having decided what changes are to be made they entrust to the teachers the work of making them. The special problem of the teacher is to make these changes as economically and as surely as is possible under the conditions of school life. His is the task of giving certain information, forming certain habits, increasing certain powers, arousing certain interests and inspiring certain ideals.

The study of the best methods of doing so may be carried to almost any degree of detail. The principles of teaching may mean the general principles applicable to the formation of all habits or the highly specialized rules of procedure for forming the habit of correct use of *shall* and *will*; they include the laws valid for the acquisition of any knowledge and the discussion of the particular difficulties in teaching the spelling of *to*, *two* and *too*. But the problem is always fundamentally the same:—Given these children to be changed and this change to be made, how shall I proceed? Given this material for education and this aim of education, what means and methods shall I use?

Psychology and the Art of Teaching

The Scientific Basis of Teaching.—The work of teaching is to produce and to prevent changes in human beings; to preserve and increase the desirable qualities of body, intellect and character and to get rid of the undesirable. To thus control human nature, the teacher needs to know it. To change what is into what ought to be, we need to know the laws by which the changes occur. Just as to make a plant grow well the gardener must act in accordance with the laws of botany which concern the growth of plants, or as to make a bridge well the architect must act in accordance with the facts of mechanics concerning stresses and strains, or as to change disease into health the physician must act in accordance with the laws of physiology and pathology, so to make human beings intelligent and useful and noble the teacher must act in accordance with the laws of the sciences of human nature.

The sciences of biology, especially human physiology and hygiene, give the laws of changes in bodily nature. The science of psychology gives the laws of changes in intellect and character. The teacher studies and learns to apply psychology to teaching for the same reason that the progressive farmer studies and learns to apply botany; the architect, mechanics; or the physician, physiology and pathology.

Stimulus and Response.—Using psychological terms, the art of teaching may be defined as the art of giving and withholding stimuli with the result of producing or preventing certain responses. In this definition the term stimulus is used widely for any event which influences a person,—for a word spoken to

The Ends and Means of Education

him, a look, a sentence which he reads, the air he breathes, etc., etc. The term response is used for any reaction made by him. -a new thought, a feeling of interest, a bodily act, an; mental or bodily condition resulting from the stimulus. The aim of the teacher is to produce desirable and prevent undesirable changes in human beings by producing and preventing certain responses. The means at the disposal of the teacher are the stimuli which can be brought to bear upon the pupil,-the teacher's words, gestures and appearance, the condition and appliances of the school room, the books to be used and objects to be seen, and so on through a long list of the things and events which the teacher can control. The responses of the pupil are all the infinite variety of thoughts and feelings and bodily movements occurring in all their possible connections. The stimuli given by the teacher to arouse and guide the pupil's responses may be classified as:—

1. Stimuli under direct control.
 - A. The teacher's movements,—speech, gestures, facial expression, etc.
2. Stimuli under indirect control.
 - A. The physical conditions of the school,-air, light, heat, etc.
 - B. The material equipment of the school,-books, apparatus, _specimens, etc.
 - C. The social conditions of the school,- the acts (including spoken words) of the pupils and the spirit which these acts represent.
 - D. The general environment,-acts of parents, laws, libraries, etc.

The Ends and Means of Education

The responses may be classified as:—

- A. Physiological responses, such as deeper breathing, sounder sleep, vigorous exercise and the like.
- B. Responses of knowledge, such as connecting a sense stimulus with an appropriate percept, abstracting one element from a complex fact or making associations of ideas.
- C. Responses of attitude, such as the connection of attention, interest, preference and belief with certain situations.
- D. Responses of feeling, such as connecting sympathy, love, hate, etc., with certain situations.
- E. Responses of action or of conduct and skill, connecting certain acts or movements with certain mental states.

The Value of Psychology.—If there existed a perfect and complete knowledge of human nature,—a complete science of psychology,—it would tell the effect of every possible stimulus and the cause of every possible response in every possible human being. A teacher could then know just what the result of any act of his would be, could prophesy just what the effect of such and such a page read or punishment given or dress worn would be,—just how to get any particular response, of attention to this object, memory of this fact or comprehension of that principle.

Of course present knowledge of psychology is nearer to zero than to complete perfection, and its applications to teaching must therefore be often incomplete, indefinite and insecure.

The Ends and Means of Education

Reflection Question

If Thorndike's characterization of psychology is accurate, can psychology have first principles?

The application of psychology to teaching is more like that of botany and chemistry to farming than like that of physiology and pathology to medicine. Anyone of good sense can farm fairly well without science, and anyone of good sense can teach without knowing and applying psychology. Still, as the farmer with the knowledge of the applications of botany and chemistry to farming is, other things being equal more successful than the farmer without it, so the teacher will, other things being equal, be the more successful who can apply psychology, the science of human nature, to the problems of the school.

Reflection Question

What are the principle elements of Thorndike's philosophy of the ends and means of education?

The Ends and Means of Education

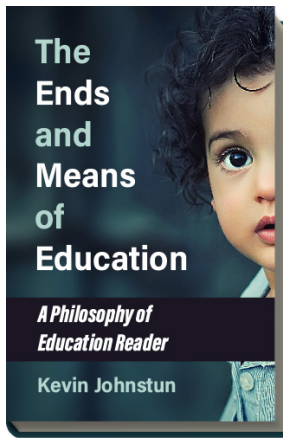
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