

TEACHING PROCEDURES

BY

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PREFACE

THIS book is not divided into Parts, but it might easily have been. The first two chapters are introductory. Chapter I strikes the keynote of the book, and Chapter II sketches briefly the aim and objectives of education as a background for the objectives of teaching. The objectives of teaching, together with the basic learning procedures involved in them, are developed in Chapters III to XIV. Chapters XV to XXIII deal, in a general way, with classroom procedures, and Chapters XXIV and XXV with the measurement of the results of teaching, leaving, however, the consideration of standardized tests for a separate course.

The idea of direct attack in teaching, which is the dominating note of the book, has been with us for a long time in connection with foreign language instruction, but it is only now becoming generally recognized that the principle underlying it is equally applicable to all subjects. It is the master key to all effective teaching. Chapter II carries the analysis of the objectives of education a step farther than has heretofore been done in print. For my orientation in this field I am indebted to Professor M. V. O'Shea under whom I served as Assistant in Education during the year 1902-03. It had long been my intention to tell him personally of this indebtedness, but I have waited too long.

For the conception underlying the analysis of the objectives of teaching in Chapter III, I am indebted to the first five chapters of Bagley's *Educational Values*, where Bagley founds this unit on bed rock. For the seed-thought in reconstructing the Herbartian procedures in Chapters IV and V, I am indebted to Miller's *Psychology of Thinking*. These procedures

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are basic in all problem-solving, whether this be inductive or deductive. Chapters VII and VIII, dealing with the organization of knowledge, derive their principles from logic, a subject that has long proved helpful to me. Logic has not yet emerged from the aridity of formalism and for that reason is disparaged by many; nevertheless, this subject has a great deal to give to teachers. Learning and understanding involve logic no less than psychology. Without a grounding in logic the theory of teaching and learning is bound to be vague and superficial.

The distinction between drill procedures and use procedures made in Chapters XII and XIII follows logically on the heels of a penetrating analysis of the objectives of teaching. The distinction clears up a great deal of confusion that has existed in the past.

Chapter XV, "The Learning Unit," forms the connecting link between the objectives of teaching and classroom procedures. For bringing this topic into new relief Morrison deserves full credit. Activity programs are viewed as a promising application of the principle of direct attack in teaching. The principles underlying intelligent study are identified with the principles underlying intelligent teaching. This unifies the teacher's task. Class instruction and individual instruction are viewed as being supplementary to one another, recognizing at the same time the importance of providing for individual differences. Tests and examinations are viewed as an integral aspect of teaching. They will constitute a stumbling-block to vital learning as long as they are treated as a hurdle set apart from teaching. The mastery conception in learning is related to the assignment of marks in the final chapter of the book.

The distraction of footnotes is avoided by making all references to a bibliography at the end of the book. The first number in these references refers to the date of the publication

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and the second to the page. Thus (Dewey '10, 79) refers to Dewey's *How We Think*, page 79.

The exercises at the close of the chapters are frequently used as a means of curtailing the text. Topics involving principles that have already been developed and topics that are controversial and so would require considerable space for development are usually given as exercises.

It is a pleasure to acknowledge my indebtedness for many courtesies received from the members of the staff of the Department of Education of the George Washington University and from the members of the faculty of the Graduate School of Education of Cornell University with whom I had the privilege of being associated while the final draft of the manuscript was being prepared. My debt to the students in both of these institutions is no less profound. They have been a delight as well as an inspiration.

W. C. R.

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CHAPTER I

DIRECT ATTACK IN TEACHING

1. *The quest for method.* When King Ptolemy I of Egypt asked Euclid if there wasn't some easier way for him to learn geometry than by studying the *Elements*, Euclid replied: "There is no royal road to geometry." That was about 300 B.C. Even before that time mankind realized that there was no royal road to learning. Education, like all other good things, must be bought with a price, and that price is painstaking and persistent effort. Yet this effort need not be dull and meaningless. It may have been true in the time of Shakespeare that boys crept unwillingly to school, but this ought no longer to be generally true today.

For several centuries now educators have been seeking for a vital approach to learning and teaching. The sense realists thought they had it in the inductive approach, making liberal use of objects and pictures; Rousseau thought he had it by letting nature and native curiosity do the work, with a tutor in the background; Pestalozzi thought he had it in psychologizing education; our "progressives" think they have it in following the spontaneous interest of children. Only a few years ago some thought the secret was revealed in the socialized recitation; this was rapidly superseded by the project method; which in turn has given way to activity programs.

Now each of these people and movements, with many others, has found something. Vital attack in teaching involves not one formula but many. We have no more reason to expect to find one panacea in the art of teaching than in the art of healing. Vital attack is more like the entrances to a temple

which has many doors, any one of which leads to the interior. There is, however, one door, known as the front door, which leads directly to the main reception hall around which all the other rooms of the temple are arranged and from which they may be most readily explored. Similarly in teaching there appears to be a front door of approach which leads directly to the heart of the subject before us and from which all other aspects of the subject gain significance and interest. This is the method of direct attack.

2. *Direct attack.* The method of direct attack in teaching means that the attack is made directly on the objectives that one wishes to realize from a subject of study, not indirectly through definitions, rules, formulæ, paradigms, scaffoldings, and other technicalities. Typewriting, for example, is attacked from the start in the way it is to be used later in the office. The goal is automatic facility resting on the sense of touch with the eyes free to follow the notes or text. This attack yields a speed in six months that is about three times as great as that yielded by the older sight method. In fact, many who learned to typewrite by the sight method never acquired an automatic facility because they found it impossible to break the habit of looking for the right keys. Others took years to eliminate the habit. Looking for the keys becomes a scaffolding without which the operator feels lost, but which must be torn out if expert facility is to be acquired. The direct attack omits the scaffolding altogether.

The field in which the direct attack is at present receiving the most attention is foreign language instruction. The direct attack in this field is discussed in Chapter XII, to which the interested reader may turn. In this field the indirect attack, which is still the attack generally used in this country, actually erects a double scaffolding to interfere with the acquisition of automatic language facility. It uses both translation and

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grammatical rules to get between the student and the language and ingrains habits that must later be eliminated if language control is to be acquired, which the vast majority, of course, never approximate.

There is no work more deadening anywhere in our school system than the foreign language instruction in our high schools and colleges, yet we appear here to be in the grip of a tradition that is next to impossible to break. The reasons for continuing the indirect attack appear to be primarily three. The first is tradition. Teachers teach as they themselves were taught. They know of no other method, or when they do learn of one they find themselves too inflexible to change. Second, the direct attack taxes the resources and ingenuity of the teacher to a far greater extent than the indirect attack and few appear to be equal to it. To lead people into a reading, speaking, and writing facility of a language is an altogether different thing from sitting back in a chair and hearing them recite grammatical rules or translate sentences. Third, the direct attack requires that the teacher have a ready control of the language himself. In our high schools especially, but to some extent also in our colleges, there are still many persons attempting to teach foreign languages who themselves cannot understand, speak, write, or even readily read the languages. These persons are obviously not in a position to use a vital mode of attack; but neither would a teacher of history, of literature, of biology, or of physics be in such a position without knowing his subject.

Physics has almost lost out in our high-school curriculum because of the formal method by which it has been attacked. It is almost everywhere approached through exact measurement, definitions, formulæ, mathematical problems, and routine experimentation. Not long ago I heard two high-school teachers of physics discussing the difficulties that their students

were meeting in the subject. Said one: "I know why students find physics so hard; they do not come well enough prepared in mathematics. We must insist that only those who are well up in their mathematics get into the course."

If that is the best diagnosis they have for the ills of physics, they are not going to save their patient. If physics is to be made significant and educative, the first course in the subject must attack physical phenomena directly, paying only minor attention to mathematical relationships. Mathematics is the grammar of physics and has no more right to obtrude itself at the start than grammar has in foreign language instruction. Children need to become acquainted directly with machines, with sound, with heat, with light, with electricity, and with magnetism. Laboratory work in the first course should resemble nothing more closely than well-directed play. Let the children begin by working quite informally with levers, pulleys, inclined planes, cog wheels, sound transmission, toy engines, and electrical appliances. Let them get shocked by the static machine. Don't be forward in calling for scientific explanations and the students will surprise you by beating you to it. They don't relish being left in the dark. Children fairly insist upon being given explanations of phenomena, once these have been brought adequately into their experience. Even mathematical relationships will soon be found illuminating. Why is it that the lever, the inclined plane, and the pulley give you an advantage? Are you getting something for nothing or must you pay for your gain in power? What, and how much?

Next the direct attack in physics demands that the class visit and learn to understand machine shops, factories, printing establishments, engine rooms, power houses, telephone exchanges, and broadcasting stations. All these things, and others, must be interpreted through the study of physics and their place in the processes of our life must be made clear.

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That is what the introductory cycle of physics is. In the second or college cycle, which should be tempered to the needs of physicists and engineers, exact measurement, precise experimentation, formulæ, and problems have the right of way, but to be meaningful, such a course ought to rest upon one like the preceding. For the first course, no matter when it is given, technicalities have no meaning, for they have nothing to rest upon. In the second course these technicalities and relationships form the substance for direct attack.

The direct attack in literature, art, and school music is treated, by implication at least, in Chapter X, and the direct attack in the social sciences is implied throughout in Chapter XI. Even though the term does not always appear, the principle of the direct attack hovers in the background of the discussion in every chapter. The direct attack is not restricted to the attack on something concrete, such as the phenomena of physics or the plant and animal life in the community, but embraces any objective that is significant and that the student is ready to master. This may be a skill as in typewriting, appreciation as in literature, or an understanding of the theory of relativity.

In gaining mastery over the direct attack, the teacher must learn to bring the significant and interesting realities of his subject before the students first, and from there lead into a consideration of relationships, rules and formulæ, if that seems necessary. In literature, art, and music this is usually not necessary, neither is it always necessary in the first cycle of natural and social science. We have just seen this movement from realities to relationships in physics and it is brought out also in respect to school music in Chapter X and in respect to foreign language in Chapter XII.

A few years ago a young woman with an interest in amateur dramatics wished to bring her topic to the attention of one

of my classes with the idea of interesting the students in her hobby. I gave her permission. She started in by telling them why they should participate in dramatics: it was good for their personalities; it developed their self-confidence; it gave them the ability to appear in public; it developed grace of carriage; it taught them to enunciate properly; and so on. She hadn't talked five minutes before they were all hopelessly bored, and instead of interesting them in dramatics, she repelled them. Why? Because she started her exposition at the wrong end. What she should have done first was to depict a few striking instances of amateur dramatics; tell them of a few actual accomplishments, and of the trials and tribulations, and of the ultimate successes and satisfactions, that came to the participants. That would have been something for the minds of the young people to hold on to and to grip their imaginations. She might then have gone on to point out a few of the values that accrue, but that would have been hazardous. Unless done very skillfully it would have resulted in an anticlimax. All these values were already implicit in the presentation and in the esthetic field they are most effective when left in that state.

3. *Subject-matter.* The method of direct attack implies a conception of the subject-matter that extends distinctly beyond the confines of a textbook. In fact, the textbook assumes a position in teaching essentially like that of the guidebook in travel. The subject-matter of physics is the actual phenomena and forces of mechanics, sound, heat, light, and electricity, that occur all about us, together with the uses that man is making of these forces. In botany it is the plant life about us and the rôle that this life is playing in our civilization. In history it is the past drama of man and his institutions, with the light that these throw on the drama and institutions of our own time. In literature it is the depiction of man's life — its comedies,