# *Materials of Learning—and Learning*

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**Fred P. Barnes, assistant professor of education, University of Illinois, Urbana, asserts that "materials of learning must be defined, selected, used and evaluated in concrete relation to their usefulness at some point on the continuum of purposeful school learning."**

DEFINITIONS of instructional materials *per se* are puzzle-headed and deluding. How to separate these materials from other aspects of the learner's environment remains an unsolved problem; except by recourse to vaporous semantics which result in equating materials one with another and eventually and logically with all objective elements in the universe. So, one reputable and recent educational book teased out this definition: "Instructional materials include anything which contributes to the learning process." A facetious reader would be tempted to ask, "What doesn't?"

### The Environment Educates

Truly, it is the environment which educates; the sources outside an individual which give rise to experience. Realization of this axiom has led students of education to stress control of the environment as a chief pedagogical problem. Dewey was concerned with the meanings of the problem in their full relationships with the business of education: "The educator's part in the enterprise of education is to furnish the environment which stimulates responses and directs the learner's course. In the last analysis, *all* that the educator can do is modify stimuli so that response will as surely as is possible result in the formation of desirable intellectual and emotional dispositions." [1]

But Dewey was not content to leave this observation in its generalized phraseology. Elsewhere, he continued: "A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth." [2]

And in another place, he pressed further for specificity in the conditions of learning: "Unless experience is so conceived that the result is a plan for deciding upon subject-matter, upon methods of instruction and discipline, and upon material equipment and social organization of the school, it is wholly in the air. It is reduced to a form of words which may be emotionally stirring but for which any other set of words might equally well be substituted unless they indicate operations to be initiated and executed." [3]

Dewey reasoned that educative en-

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1 John Dewey. *Democracy and Education.* New York, The Macmillan Company, c1916. p. 212.

2 John Dewey. *Experience and Education.* New York, The Macmillan Company, 1939. p. 35.

3 *Ibid.*, p. 17-18.

vironing conditions must be seen in specific terms based on the "experiential continuum," "interaction" between the individual and his environment, and the "deliberate educating of the young." His emphasis on concrete recognition of educative situations may well be seen in his comment: "There is no such thing as educational value in the abstract." [4]

### Need for a Plan

This takes us back to the enigma of defining instructional materials. But it also provides a starting point for understanding and dealing with them. Attempting to deal with materials as an abstraction is an unrewarding and unenlightening occupation. However, if the materials problem can be dealt with in terms of a *plan* for concretely deciding upon which experiences lead to growth and what materials in that environment will best result in desirable dispositions, education may not be "wholly in the air."

### A Beginning Place

The search for a plan which clearly indicates decisions to be made and procedures to be followed might well start with the failure to define materials of learning. The basic fault here lies in discussing materials as though they possessed educative values in and of themselves. Textbooks, films, maps, globes, paints, clay, pictures, charts, workbooks, encyclopedias, newspapers, tools, community resources, phonograph records, toys, science equipment, sand tables, and bulletins are each frequently defended as having inherent qualities which produce educational magic. Nothing could be more mistaken. Unless the materials of learning are seen in close interrelationship with the objectives and processes of school learning they are void of meanings which might lead to educative experiences of value.

Our first step toward a plan, then, is clearly indicated. The materials of learning must be defined, selected, used and evaluated in concrete relation to their usefulness at some point on the continuum of purposeful school learning. Any given material has value only as it promotes desirable development of the learner at a specific time on his route toward adult levels of understanding and performance. This view of materials makes essential a clear and definite conception of the learning objectives and processes of the school. Determination of objectives and processes follows as steps two and three in the evolution of the plan. Obviously, space limitations prevent any detailed analysis of these steps here. However, sufficient basic points to establish direction may be made.

### Learning Objectives

The objectives of school learning may be given integrity through two observations. The first of these is that the learning in school should not be the same as the learning which is life. The school may deal with the materials of the culture but the learnings intended should be unique to the school. While the learnings which are life are fortuitous and largely unconscious in intent, school learnings should deliberately be selected through planned environments which will result in con-

[4] *Ibid.*, p. 46.

scious acquisition of knowledge for use. On this point, Dewey wrote a helpful statement: "It is not the business of the school to transport youth from an environment of activity into one of cramped study of the records of other men's learning; but to transport them from an environment of relatively chance activities (accidental in the relation they bear to insight and thought) into one of activities selected with reference to guidance of learning."[5]

The second observation is that the long-range target for all grade levels of the school should be accurate perception and use of adult-organized subject-matter. Referring to Dewey, again: "When education is based in theory and practice upon experience, it goes without saying that the organized subject-matter of the adult and the specialist cannot provide the starting point. Nevertheless, it represents the goal toward which education should continuously move."[6]

From the starting point on, the school should guide the pupil continuously toward better intellectual ordering of experience. It is within this sequence that the various materials of learning (materials for educative experience) begin to take on meaning and be capable of differentiation.

Thus, the learning objectives of the school, as a simplified and selective environment, are to continuously work toward increasingly complex intellectual ordering of experience through selection of experiences which will increasingly promote conscious awareness of knowing.

[5] *Democracy and Education*, p. 320.

[6] *Experience and Education*, p. 103.

### The Learning Process

The process of school learning draws its distinguishing characteristics from the *kind* of learning the school's objectives imply. The process should be directional, developmental, and deliberately guided toward a goal—the achievement of mature mind. Dewey expressed something like this in his discussion of the development of subject matter in the learner: "In its first estate, knowledge exists as the content of intelligent ability—power to do. This kind of subject matter, or known material, is expressed in familiarity or acquaintance with things. Then this material gradually is surcharged and deepened through communicated knowledge or information. Finally, it is enlarged and worked over into rationally or logically organized material—that of the one who, relatively speaking, is expert in the subject. . . Recognition of the natural course of development . . . always sets out with situations which involve learning by doing."[7]

Students of pedagogy in the subject areas which lend themselves to tangible observation of learning as it develops, have worked out refinements of Dewey's formulation. Educators in art, arithmetic, and physical education have noted a progression in the learning process which begins with: (a) a readiness to accept and seek the learnings indicated; then moves to (b) a level of exploration and discovery; which grows into (c) ability to verbalize and symbolize constructs gained from earlier experience; which makes possible (d) systematic generalizations pregnant with interrelated meanings.

[7] *Democracy and Education*, p. 216-17.

Teachers in the fine and applied arts, swimming, ball-playing, cooking, arithmetic, and similar subjects take it for granted that effective teaching does not begin with adults' refined constructs *about* the subject. The beginning place is with active occupations at the crude level of the immature learner. It would be ludicrous, indeed, to teach naive learners how to swim, catch a ball, cook, or make change, through recourse only to a book-for-the-subject. The more mature learner can learn much of value, in these very areas, from experts who have systematized and interrelated for communication the necessary abilities and knowledges.

In spite of the fact there is no evidence that any learnings differ in basic process from the ones cited, instruction in history, geography, spelling, and the like still begins and ends with the book, which is a compilation of systematic generalizations; the end point.

The process of school learning is from naivete to maturity. For a particular learning, an adult may be naive. For another learning, a child may be mature. Thus, the principle deals with the experiential state of the learner, not necessarily with chronological age. But for any learner, the learning progression is through the four steps, from naivete toward maturity.

The school deals with a double-headed problem: All children are immature when measured against levels of adult operation. However, any child may be temporarily mature *at his own level of development*. Because of this bifurcated problem, a plan for deciding upon experiences and materials must be capable of dealing with both problems at the same time.

Now, we have the necessary undergirding for constructing a plan which can "indicate operations to be initiated and executed" in the selection, use, and improvement of materials for learning. Materials are to be defined in terms of their concrete interrelationships with phases of learning from naivete to maturity. In turn, the phases of learning gain meaning from the objectives of school learning which focus on conscious learning from raw experience through refined intellectual ordering of vicarious experiences.

### Materials Classified

One consideration remains: Since the four progressive phases in the learning process imply a continuum from direct experience to reasoning with abstract symbols as materials, it is reasonable to categorize materials of learning according to types which indicate kinds of materials best calculated to promote efficient learning at each of the four learning levels.

The task remains to put together (a) types of learning materials, (b) four phases of conscious learning, and (c) the learning objectives of the school. Because these are interrelated and because they must be seen as parts of the same process, they are presented in graphical form. (See Figure 1.) Obviously, the graph does not imply tight lines of demarcation between the various steps but rather indicates a directional flow which naturally involves overlap.

### Four Operational Assumptions

Further understanding of the model may be promoted by reference to certain operational assumptions concern-

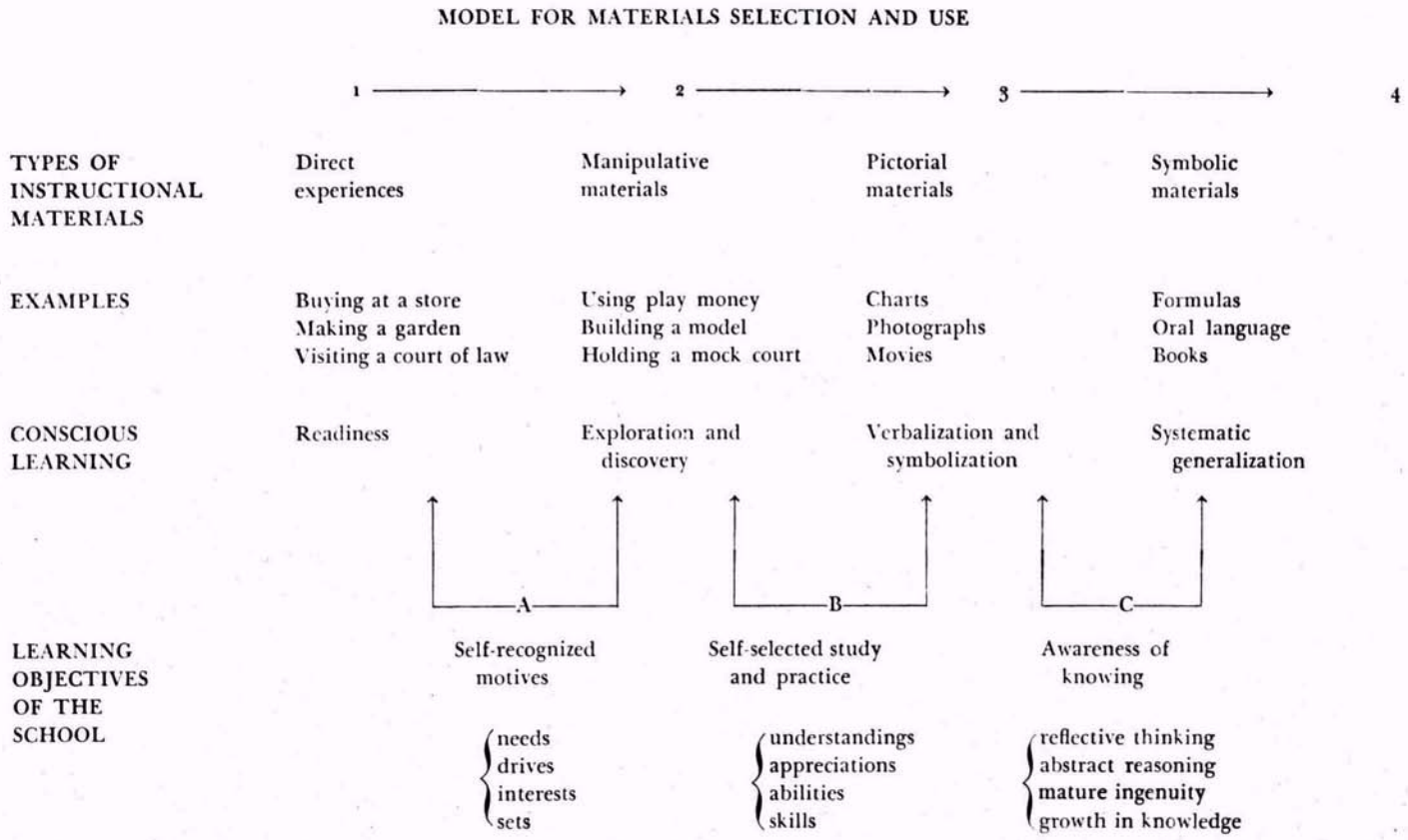


*Figure 1. Graphical presentation of model for materials selection and use.*

ing its use in deciding upon experiences and materials which will guide learning in desirable directions. Four such assumptions have been selected:

- In situations where the pupil is naive, learning proceeds best from concrete, direct experiences and materials.
- In situations where the pupil is mature, learning proceeds most efficiently from symbolic materials.
- Continuity in school learning may be found in the pupil's directional growth from naivete to maturity.
- The continuity factor is of prime importance both in relatively short-range, specific learning situations and also in general, long-range maturing toward adult levels of performance. The model is useful to indicate successive choices to be made, for example in a unit of work, and also to indicate choices in terms of "the long look ahead."

### Seven Shocking Hypotheses

The model, together with the operational assumptions, now makes possible pointed hypotheses concerning the various materials of learning. It is at this point that "operations to be initiated and executed" gain a rationale and materials to be selected for particular purposes become capable of sensible differentiation and definition. With a view toward being more suggestive than exhaustive, seven hypotheses have been chosen for purposes of this report. They are intentionally phrased in negative terms to emphasize the relatively restricted use of any particular material for learning, once it is defined in relation to school learning process and objectives.

The seven hypotheses follow:

- *Direct experiences may limit learning.* Although this is a proper beginning place for building meaning, there is a point at which concrete objects become cumbersome to thought. Continued beyond this point, direct experiences may freeze learning at levels of immaturity.
- *Schoolroom "activities" may prevent valuable learnings.* Related to the preceding statement, this hypothesis suggests that overt activity, for its own sake, may crowd out the contemplation and concentration necessary to meaningful study and practice.
- *Many and different materials may be confusing.* The current emphasis on varied materials in the school environment may result in disintegration of the learning process if their selection is helter-skelter and not the result of planning toward progressive organization of information and ideas.
- *Instructional films may be great time wasters.* Movies have neither the multisensory value of direct experiences nor the intellectual sweep and depth of the printed page. Used indiscriminately or faddishly they fail to enrich constructs already forming.
- *Books may represent the most uneconomical avenue to learning.* By definition, shallow verbal facility is a miseducation and extravagant of time invested. Books cannot help the immature learner toward enriched and meaningful constructs. They must be interpreted by the reader through the constructs he brings to the reading. In this respect they are most economical as aids to the reader's developing generalizations.

• *Charts and maps may conceal meanings.* These materials consist of shorthand symbols to represent meanings. They are highly concentrated representations of complex situations. To the learner, who does not possess sufficiently clear and rich intellectual images to match the symbols, they may remain as meaningless hieroglyphics.

• *Oral and written language may lead to totally false constructs.* Language is omnipresent and too seldom is recognized as consisting of abstractions. Children's boners, far from being neat morsels for adult humor, are ready evidence of the false constructs naive learners may gain from language beyond their experience.

Turned inside-out, these seven negatively-phrased hypotheses indicate positive reasons for particular usages of the materials discussed. If the model is soundly based, decisions on learning experiences to be selected and materials to be arranged in learning environments may all be subjected to the same sort of critical selection. Just as there is no educational value in the abstract, so there probably is no material of learning of value in the abstract. With a particular group of pupils, at a particular time and in a particular place, particular educative environments must be provided with learning materials selected to lead the learners from some stage of naivete toward maturity.

### Research Needed

This is a theory based on many other theories. It concerns the ordering of the educative environment according to a definite plan. If it is true that "*all* that the educator can do is modify stimuli so that response will . . . result in the formation of desirable intellectual and emotional dispositions," then empirical testing and research on the theory is a prime pedagogical need. Through such testing there lies promise of refinement for both the materials of learning and the achievements of modern education.

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