

## EDU 6526 Instructional Strategies

### Reading 4: David Ausubel

#### “Instructional Materials” by David Ausubel

The conditions of learning primarily influence the meaningful acquisition and retention of ideas and information by modifying *existing* cognitive structure. The effect of such modification on learning and retention cannot be empirically demonstrated except by using the transfer paradigm (by measuring its effect on the learning and retention of new tasks). However, the changes in cognitive structure wrought by practice or by exposure to successive aspects of the task obviously have an important impact on intratask mastery itself. This is particularly true in the case of those kinds of learning in which each component task (as well as entire bodies of subject matter) tends to be compound in content and to manifest an internal organization of its own.

Thus, in school learning, conditions influencing and altering cognitive structure are typically crucial both for the acquisition of a particular task as well as for transfer purposes (the learning of related new tasks). Of all the possible conditions of learning that affect cognitive structure, it is self-evident that none can be more significant organization of the material.

The principles of progressive differentiation and integrative reconciliation have been represented as being of central importance in the programming of meaningful subject matter. Optimal utilization of these principles presupposes not only their consistent use in the sequential presentation of subject matter material but also the supplementary availability of a hierarchical series of advance “organizers.” These latter organizers provide relevant ideational scaffolding, enhance the discriminability of the new learning material from previously learned related ideas, and otherwise effect integrative reconciliation, generality, and inclusiveness that is much higher than that of the learning material itself. To be maximally effective they must be formulated in terms of language and concepts already *familiar* to the learner and use appropriate illustrations and analogies if developmentally necessary.

True organizers, thus defined, should not be confused with ordinary introductory overviews. The latter are typically written at the same level of abstraction, generality, and inclusiveness as the learning material and achieve their effect largely through repetition, condensation, selective emphasis on central concepts, and prefamiliarization of the learner with certain key words. ...[T]here are significant differences in achievement when differing introductory material is used.

Summaries are comparable to overviews in construction, but are probably less effective because their influence on cognitive structure is retroactive rather than proactive relative to the learning task. They are probably more useful, in place of the material itself, for purposes of rapid review than for original learning. However, insofar as they may imply to some learners that the material they do *not* include is relatively superfluous, they may promote neglect of and failure to study or review much significant subject matter.

Organizers also have certain inherent advantages both over various kinds of intramaterial organization (organizing aids within the body of the material) and over any existing subsumers within cognitive structure that could be used for organizational purpose. Intramaterial organization (executed in accordance with the principles of progressive differentiation and integrative reconciliation) successively provides necessary anchorage for and differentiation of new ideas at a particularized level just before each new idea is encountered. In contrast, organizers perform the same functions in advance at a much more global level before the learner is confronted with any of the new material. Hence, for example, a generalized model of class relationships is first provided as a general subsumer for *all* new classes, and species before more

limited subsumers (classes or subclasses) are provided for the particular subclasses or species they encompass. And the various kinds of forests are first distinguished from each other before the component subforests and trees are similarly differentiated. Spontaneously existing subsumers in cognitive structure, on the other hand, lack both particularized relevance for the new material (since the learner cannot possibly anticipate its precise nature) as well as the benefit of the sophisticated knowledge of subject matter and pedagogy available to expert programmers.

Perceptual organizers, in contrast to the integrative organizational devices just described, merely provide built-in mechanical aids that make the material perceptually more salient and apprehensible or otherwise facilitate practice. These include rhythmic aids, vocal emphasis, the isolation and familiarization effects of underlining, and the “fractionation” effect (breaking of wholes into parts) or providing headings and subheadings. Under certain circumstances, however, some perceptual organizers can be said to have true integrative effects (for instance, underlining that helps make ideational distinctions or emphasizes central concepts; headings that reveal the organizational structure of the material more clearly).

Perceptual or mechanical organizers generally facilitate meaningful learning—more so in the case of factual than of abstract material. The learning of meaningful material, for example, is enhanced by appropriate vocal emphasis, by underlining, and by breaking instructional film content into parts by means of inserted questions. Typographical highlighting of the more important material to be learned reduces the amount of learning of less important core content. The failure of informational learning to increase proportionately with increase in the density of facts in film may be partly ascribed to the loss of patterning or isolation effect as “filler” material is removed.

Generally speaking, it makes good organizational sense if the presentation of more detailed or specific information is preceded by a more general or inclusive principle to which it can be related or under which it can be subsumed. This not only makes the new information more meaningful and enables the student to anchor more easily forgotten specifics to more easily remembered generalizations but also integrates related facts in terms of a common principle under which they can all be subsumed.

In a physics or biology class, for example, the general characteristics of all regulatory systems should be presented before considering any particular regulatory system. The latter, in turn, should be explicitly related to the more general principles, showing how they exemplify them. This makes sense for some redundancy; but such redundancy, in turn, greatly reinforces the general principles. Of course, the general principles themselves must be stated in terms and concepts that are already familiar to the learner. Many teachers and textbooks are guilty of introducing complex and detailed information for which no adequate foundation has been laid in terms of organizing, unifying, or explanatory principles.

Thus a substantive introductory statement of the principal new ideas to be considered in the chapter, stated at a high level of generality and inclusiveness, to which the more detailed information in the chapter can be related, could be very helpful in learning the latter information. For example, a brief overview of the chief propositions underlying homeostasis was shown to facilitate learning more than an historical overview of early work in this area.

It is desirable not only for the material in each chapter to become progressively more differentiated (to proceed from ideas of greater to lesser inclusiveness), but for textbooks as a whole (from one chapter to another) to follow the same organizational plan. The *spiral* kind of organization, in which the same topics are treated at progressively higher levels of sophistication in successive sections, is an extension of the same principle. Textbook series in a given field that are intended for use at different instructional levels (elementary and high school) can also follow this organizational plan. In this instance there is a progressive increase in scope, depth, complexity, level of abstraction, and level of sophistication at successively higher grade levels, with the earlier acquired knowledge serving as a foundation for the more abstract and complex material introduced later. In addition, however, some entirely new topics are introduced at the

higher levels, since many advanced topics are too complex and abstract to be taught successfully on an intuitive basis.

From David Ausubel, et. al., "Instructional Materials," from *Educational Psychology: A Cognitive View* (New York, 1978).