Overview of Current Learning Theories for Media Centers

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Contiguity theory holds that the student learns what he has the opportunity to do. Whatever he observes becomes a stimulus to be associated with any response that occurs shortly thereafter. When the stimulus reappears, the student tends to repeat the response which he associated previously with the stimulus. The responses are not necessarily restricted to observable behaviors or to those usually controlled by the learner.

This theory has as its roots the classical conditioning experiments of Pavlov. In classical conditioning, learning is the shifting of old responses to new stimuli. It occurs in situations in which stimuli which produce the desired response are paired with other stimuli which do not. As a consequence, the new stimulus becomes associated with the old response. J. B. Watson's approach and concern in the use of conditioning was instrumental in the development of the area referred to as "behaviorism."

Guthrie became concerned with practice as a way to knit specific stimulus-response (S-R) bonds together to form larger behavior units called acts. Current theoretical formulations of contiguity theory do not find the transfer concept very workable and tend to define retention problems as the result of learning new responses to stimuli similar in nature to previously acquired useful S-R bonds. The newly learned bonds thus interfere with the old bonds.

Some of the "micro" concerns of contiguity theory are reflected in programmed learning materials and single concept learning materials.

In contiguity theory the control of the stimulus is the prime concern, but in *reinforcement theory* the concern is more with response generation and the control of consequences following the occurrence of the response.

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Generally speaking, when responses are followed by some form of satisfaction, the future occurrence of the response becomes more probable. Thorndike's law of effect thus holds that any stimulus-response connection will be strengthened if its formation and occurrence are satisfying. Punishment as a form of reinforcement is judged to be very unpredictable and not of much use.

Among the various proponents of reinforcement theory, Miller too was concerned with reinforcing responses. He proposed four constructs called *drive, cue, response,* and *reward.* In Miller's approach, drives were seen to impel the student to act. The cues then functioned as stimuli which acted to limit how the student acted in response to a drive. A response matched to a drive usually resulted in drive reduction, and drive reduction then was seen to function as a reward or form of reinforcer.

Skinner's descriptive behaviorism relates to controlling responses that occur with no direct stimulation; that is to say, responses which are emitted rather than elicited. The resulting behavior is referred to as operant behavior because it seems to operate in or on the environment. Skinner's work on operant conditioning led to the development of linear programmed instruction techniques. One of the major outgrowths of this work is the concern that students should not be allowed to passively encounter learning materials. Indeed it was proposed that the student should actively construct his responses.

Retention and resistance to forgetting or extinction are seen to depend on factors such as the number and pattern of reinforcements during learning and the motivation of the student. Transfer is regarded to occur when the student finds the new stimuli similar to previously encountered stimulus-response combinations which had been reinforced.

Some programmed instruction materials are heavily dependent upon reinforcement theory as are some multi-media kits, self-instructional packages, and computer-assisted instruction.

In *cognitive theory,* learning is seen as a function of changes in perception and knowledge. Learning also involves understanding and insight.

Gestaltists believe that we react to our inner perceptions as they are organized into patterns called gestalts. Learning then becomes the process of forming new gestalts or producing new patterns for the total situation. A quick change occurring in the gestalt is called an insight. The law of similarity indicates that similar words or ideas are

easier to associate and recall than dissimilar words or ideas. The law of proximity suggests that patterns or gestalts are more evident when the elements of the gestalt are close together. For gestaltists the law of closure is like the principle of reinforcement; that is to say, the solution of a problem creates a pattern or gestalt.

The current knowledge of the student becomes foundational to further learning. He seeks to "fit in" new information within his overall cognitive structure. The concerns of cognitive theory lend strong support for a media center designed to provide a variety of experiences and knowledge forms in a program of teaching and learning throughout the school.

In *modeling behavior theory* students exposed to behavior models tend to generalize the models to new settings in which the models are absent. The closer the model resembles "reality," the more probable that the student will imitate the behavior. Various educational games and simulations have as their foundations the incorporation of elements of modeling theory.

Gagné proposes a *unified theory,* a hierarchical model of eight types of learning—signal learning, stimulus-response learning, chaining, verbal association, multiple discrimination, concept learning, principle learning, and problem solving.[1] Problem solving is the highest level in the hierarchy. Each of the higher levels in the hierarchy requires the previous lower level as a prerequisite. Gagné places a strong emphasis on structure of knowledge within his analysis of types of learning.

Some curricular reforms and experiments rely heavily upon the unified theory of learning approach while some new learning package schemes such as Unipac from I/D/E/A are fundamentally designed around a careful specification of the parameters of learning and the success of learning for students using the learning packages.

IMPLICATIONS FOR THE MEDIA CENTER

From stimulus-response and contiguity theory one can extract the following principles and recommendations:

The learner should be active rather than passive. Activity may be defined in different ways, i.e., if the student does not have access to material other than that presented in the classroom, he may never have the opportunity to actively explore an area of concern for relevant information. This kind of activity seems to argue well for the basic necessity of a well developed media center and program.

Frequency of repetition is necessary to provide overlearning in

order to guarantee retention of the information. This principle could be interpreted to support the necessity to provide varied groups of resources at each level of knowledge within each area of knowledge. If the student has the opportunity to explore several authors' concerns about a given area, and assuming the student examines each critically, he will probably retain the information more effectively.

Reinforcement is desirable for correct responses. Generally when seeking the acquisition of materials which purport to guarantee a specific level of learning, reinforcement techniques should be readily observable in the materials.

It is desirable to be able to generalize to a wide range of stimuli when necessary. The media center collection should contain a variety of materials in each subject area in order to permit the student to explore ideas which would permit him to generalize his knowledge.

It is desirable to be able to discriminate between stimuli. A wide variety of materials for each subject area would allow the student an opportunity to develop discrimination skill both at the "micro" level within an area and at the "macro" level between areas.

Novelty in behavior is enhanced through imitation of models. A wide selection of biography and autobiography and anecdotal material which shows how people have made effective use of knowledge in exploring their worlds would provide the models for students to imitate.

Some of the principles from cognitive theory relate effectively to the rationale for the media center:

The perceptual features of a problem encountered by the student are important conditions of learning. A variety of media centered around a central problem and featuring different perceptual features of the problem will allow students to grasp more easily small patterns for inclusion in their overall cognitive pattern or gestalt.

Organization of knowledge from simplified wholes to more complex wholes is desirable. The materials in a media center should range from the simple to complex for each subject area in the collection. Moreover, all the materials in the collection should be evaluated in terms of such a continuum and should be capable of referencing by level on the continuum.

Learning with understanding is more permanent and more transferable than rote learning. While a broad range of materials in a media center does not necessarily guarantee that the student will use them

to gain additional understanding, it certainly does afford the opportunity to gain increased understanding of an area or problem.

Divergent thinking leading to inventive solutions to problems is desirable. While there are different interpretations of divergency relative to the student and his experential background, it would seem that at the very least the student should have the chance to locate and evaluate solutions which are "divergent" in the sense that he was not previously aware of the solutions. Examination of such divergent solutions may eventually encourage the student to develop and explore insightful solutions of his own. A media center with a variety of materials in a relatively large number of areas seems to be a prerequisite for such activity unless one is relying totally on some form of innate ability.

Motivation and personality theory can also lend a few principles in support of the rationale of the media center:

Students' abilities vary, hence some provision should be made to accommodate the various types of learners. Such a principle argues very strongly for a wide variety of materials specifically designed to be effective with students of varying ability. In a sense a media center must be all things to all learners.

Learning is culturally relative. The range of materials must also be varied so that they can be culturally relevant to each learner. This means that the materials in the center should reflect the cultural values and language of each cultural subgroup being served by the media center.

Organization of motives and values determines and affects the student performance on short-range goals. The collection of materials in general should contain special materials designed to help students examine and reformulate their own motives and values systematically. Such materials should also be designed to require active commitment from the student with regard to his motives and values.

Forming desirable attitudes and values are important goals of multimedia resources and centers.

An attitude, according to Klausmeier, is "a learned, emotionally toned predisposition to react in a consistent way, favorable or unfavorable, toward a person, object, or idea." [2] An attitude has meaning for the individual but is basically inferred from the individual's behavior rather than directly measured.

Using Klausmeier's continuum, we find the individual progresses

from tastes to attitudes to the establishment of values. By way of example, tastes would generally be concerned with specifics such as a particular composition; attitudes would refer to acceptance or non-acceptance of categories of compositions; and values would be the guiding principles which establish the general tone of life for a person.

The lack of concern or attention to the generation of values generally leads to conflict between subcultures in a nation. Attitudes and values can be learned rather than caught. They are usually learned by experiencing a series of experiences which are more or less emotional in nature and which contain some information. Another approach to learning involves forming attitudes and values by the acquisition of a mass of information with only a modicum of emotion involved. There is also the situation of learning values by hearing a highly respected source refer to them and stipulate their worth.

It seems that the media center could and should be an impressive resource tool in providing information and surrogate experiences for use by the student in forming his tastes, attitudes, and values.

A POSSIBLE MEDIA CENTER OF THE FUTURE

In addition to the basic requirements set forth in the new *Standards for School Media Programs,* the following ideas might well be found in a media center of the future:

1. All materials will be shelved together on an integrated stacks basis.
2. There will be a considerable usage of materials of the Unipac variety in individual carrels and classrooms.
3. A heavier usage of carefully devised instructional materials which are basically programmed in nature will become evident. This would include programmed instruction, mini-courses, and audio-tutorial programs.
4. Various multi-media kits would be available and would be designed to:
   a) allow the student to learn from at least one communication channel as a natural outgrowth of the concern for individual differences, and
   b) provide opportunity for stimulus discrimination by using various stimulus forms to elicit appropriate response set.
5. More single-concept materials which allow the prescription of a group of materials to remedy deficiencies or the exploration of specific areas in depth will appear.

6. Existing materials will be examined in depth in order to specify excerpts which would be useful as single-concept materials to be used in concert with those mentioned above.

7. New materials will appear in the form of kits or packages in which the student will be required to respond continuously and actively and to receive immediate reinforcement.

8. Students will be able to query a general information base from a remote on-line terminal in the media center. The terminal would provide basically a color, three-dimensional television screen (cathode ray tube), a typewriter type keyboard, a light pen for those who cannot or do not wish to use a keyboard or those who wish to enter graphic information, and a robot terminal attachment for office typewriter for hard copy when desired.

The information base would contain a listing of all materials in the center collection by concept inclusion, level of difficulty, and content field relational information. The teacher or student could request a review or printout showing which materials are available on a single-concept, or group-of-concepts basis. The student could even specify the inclusion of some concepts and the exclusion of others.

With information on the capability of a student (based on predictive instruments and his past performance record), the information system could be designed to print out a recommended pattern of concepts by specified levels of difficulty. The result would be a very personalized prescriptive instructional sequence for the student.

9. The computer query system could also be designed to help the student learn to combat his own personal problems of referencing information in the center's collections. It could hold a record of the student's idealized cognitive structure and help him with the problem of seeking information to explain the discrepant events which do not seem to fit his cognitive structure.

10. A random access whole document retrieval system could help the student encounter only those particular concepts and portions of information which he needs. Such a system should provide for student response and immediate reinforcement of his correct responses. The random access system could be connected by an interface device to a time-shared, computer-assisted instruction system (CAI). When an instructional segment required the use of a motion picture segment or an audio tape segment, the CAI system would automatically dial or request the particular information to be played for viewing at the instructional carrel.

11. The use of serial random access audio and video tape recorders with a small "memory" attachment could allow the student to come to the media center to "model" some specific behaviors or attitudes. These devices would permit the student to view some simulation situations containing branching alternatives. He would then record his response and be presented with a sequel which derives from his response. The memory device would remember all of the locations numbers in sequence. By pressing the button for consecutive replay, the student could then see the entire modeling played back continuously.

12. Many students in a media center are essentially browsers who manifest, in reinforcement theory terms, operant behavior. Information concerning this behavior and frequency and quantity of browsing choices could be stored on a computer and used as the basis, in combination with their past academic history, for building a reinforcement schedule for successful information acquisition.

Some of the ways in which the media center can be pivotal in value acquisition are as follows:

1. It should provide extensive media forms which are placed in the rhetoric of the various subcultures. These materials should be in the form of open-ended highly realistic experiences. They should be framed around single values or attitudes.

2. There should be available accurate information and resources of the historical development of various subcultures with particular concern for explicating the underlying values and the function of those values in guiding people in action.

3. There should be books, motion pictures, slide-tape sets and audio recordings of biographic information about key leaders and their respective value orientations. The approach here would be to provide for the student as realistic an identification as is possible with the historical protagonist.

4. And then, of course, there should be available art forms produced by people who are representative of particular subcultures and who are trying to explicate values in art forms.

5. There should also be a sort of keyword index for the above materials based upon the various tastes, attitudes and values which a student might wish to encounter. The whole focus here is to help the student more effectively control and develop his own values and attitude formation.

Undoubtedly there will be many other innovations available in the

well designed media center of the future, but these seem particularly appropriate from the standpoint of learning theory contributions. To understand one's being is but the first step in worthwhile living. It is, however, the most crucial. Life without meaning is mere existence, not living. The great power of the effective media center is that it can provide the opportunity for the student to arrest thought for examination and analysis.

References

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2. Klausmeier, Herbert John. *Learning and Human Abilities: Educational Psychology.* New York, Harper Publishers, 1961, p. 254.

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