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## Chapter 3: Active Learning Based Upon The Work of Piaget

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### Chapter Three

#### Active Learning Based Upon The Work of Piaget

Robert G. Fuller

A Piagetian-based classroom instruction strategy to assist students in the development of logical thought was developed by Robert Karplus.<sup>1</sup> It was called the Learning Cycle. The Learning Cycle has been modified for college instruction by the ADAPT faculty.

An ADAPT Learning Cycle is divided into three major phases known as *Exploration*, *Invention*, and *Application*. The general characteristics of each phase of an ADAPT Learning Cycle are -

**EXPLORATION** - Following a brief statement of topic and direction, students are encouraged to learn through their own experience. Activities are supplied or suggested by the instructor which will help the students to recall (and share) past concrete experiences and to assimilate new concrete experiences helpful for later *Invention* and/or *Application* activities. During *Exploration* the students receive only minimal guidance from their instructor and examine new ideas in a spontaneous fashion.

Emphasis - Concrete experience with familiar objects and systems.

Focus - Open-ended student activity.

Function - Student experience is joined with appropriate environmental options not previously considered by the student.

1. This phase of the learning cycle provides students with reinforcement of previous concrete experience and/or introduces them to new concrete experiences to be related to the later *Invention* phase.
2. *Exploration* allows for open-ended considerations, encouraging students to use concrete experiences to consider new ideas.
3. During *Exploration* the instructor supplies encouragement, provides hints, asks questions, and suggests alternatives. The instructor should encourage students to try a variety of experiments.
4. Student behavior during *Exploration* provides information concerning the student's ability to deal with the concepts and/or skills being introduced. The students will reveal the reasoning skills which they evoke in search for the solution to a problem.

Questioning Skills and Strategies: Open-ended questions are asked to broaden an area of study by generating multiple possibilities. The instructor uses extended wait-time and may even expect no answer at all.

- INVENTION** - In this phase the concrete experiences of the *Exploration* are used as the basis for generalizing a concept or for inventing a principle. Student and instructor roles in this activity may vary depending upon the nature of the content. Generally, students are asked to invent part or all of the relationship for themselves with the instructor supplying encouragement and guidance when needed. This procedure allows the students to gain confidence through familiarity with the concepts invented.
- Emphasis - Generalization of concrete experiences and invention of hypothetical possibilities.
- Focus - Student's active involvement with instructor for generalization.
- Function - Students become familiar with generalized concepts and/or skills.  
 1. During this time students are encouraged to formulate relationships which generalize their new ideas and concrete experiences.  
 2. The instructor acts as a mediator in assisting students in formulating these relationships to be consistent with results of their *Exploration* activities.
- Questioning Skills and Strategies - Focusing and valuing questions are asked to encourage the transformation of information and the determination of appropriateness of results. Such questions require a long wait-time, perhaps 5 seconds or more. Some direct information questions are usually asked so that factual information can be broadly shared.
- APPLICATION** - The *Application* phase allows each student an opportunity to directly apply the concepts or skills learned during the *Invention* activities. *Application* provides the students with additional broadening experiences. They use the invented concepts in different concrete settings. The Learning Cycle allows each student the opportunity to think for himself. The instructor is a present overseer of activity. Yet he must guard against overplaying his role as director and facilitator. He must provide an open classroom atmosphere within a well-defined boundary sphere within a well-defined boundary.
- Emphasis - Relevant use of generalized concepts and/or skills.
- Focus - Directed student activity.
- Function - Further use of generalized concepts in other systems.  
 1. To begin the *Application*, the students and the instructor may interact in planning an activity for applying the invented concept and/or skill. The activity should provide a new or unique concrete situation.

2. Students are asked to complete the designed activity to the satisfaction of the instructor. The activities should provide further experience which will act as broadening and stabilizing experiences related to the new skills or concepts.

Questioning Skills and Strategies - Goal-oriented questions are asked that may require activity on the part of the students. These are questions that may set the students to work on a common task.

<sup>1</sup> SCIS, Teacher's Handbook (1974), Lawrence Hall of Science, University of California, Berkeley, CA. 94720.