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Module 8: Self-Regulation

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Module 8

Self-Regulation

Introduction

How can students be made more aware of their own reasoning? This question identifies one aspect of formal thought. It must be answered if students are to proceed to formal operational thought by self-regulation, the process whereby an individual advances from one stage of development to the next. We have alluded to self-regulation in several of the earlier modules but concentrated on the characteristic reasoning patterns associated with each stage. In this module we shall describe self-regulation in detail.

Objectives

To assist you in describing self-regulation.

Procedure

1. This module begins with two activities, the **Mirror Puzzle** and **Petals Around the Rose**. Please participate in both.
2. After completion of both activities, please read the essay on self-regulation.
3. Join one of the discussion groups in the room. In this group you should:
 - a) share with others your experience in self-regulation while playing Petals Around A Rose.
 - b) Bring up any question or insights you have from Piaget's "Development and Learning" paper.
 - c) Recall and interpret some of your previous learning experiences in terms of the self-regulation model.
 - d) Try to relate the self-regulation concept with your experience as a teacher.

The Mirror Puzzle

In an attempt to simulate the experience of a student using concrete reasoning patterns in a college class that requires formal reasoning, we have constructed a puzzle that requires you to make drawings while looking into a mirror. In our experience, only a few persons can make drawings under these conditions with some facility, most have initial difficulty but can teach themselves, and a few have serious blocks that appear to prevent them from mastering the skill.

Join with another participant in using the mirror puzzle. Take turns with your colleague to draw the patterns suggested in items A, B and C. Try to become conscious of your own technique while you are drawing and observe carefully while your colleagues are working to identify their learning strategies. After each person's turn is concluded, the "observers" might tell him what they thought he was trying to do, and he could then describe how he perceived his own efforts.

After each of you has used the mirror puzzle, exchange ideas regarding your efforts and difficulties. Did your reasoning patterns change while you were using the puzzle? What feedback from your actions was especially helpful? What new procedures did you adopt? What errors persisted in spite of your best efforts? What direction and/or shape of line was easiest to draw while looking into the mirror? Which was the most difficult? Did right vs. left-handedness seem to affect the result? Could you do better with your eyes closed than open?

Petals Around A Rose

In an attempt to simulate the intellectual and emotional experience of a student using only concrete reasoning patterns in a class that requires formal reasoning, we have chosen an exercise called the "Petals Around A Rose" game. Our purpose in playing this game today is to have all workshop participants have a common learning experience to serve as background for Piaget's second key concept, Self-regulation. To this end, as you play the game please note your reasoning processes.

To begin the game, someone who knows the rule will roll several dice (we will start with five) and will tell you how many petals around a rose are showing for that roll. This will be repeated as often as necessary for most of you to discover what the rule is which determines the number of petals showing on a roll. The same rule will work for any number of dice. The back side of this page gives examples of the number of petals showing on rolls of our dice.

The game "Petals Around A Rose" is very simple but seems quite baffling to some college teachers. It has only two basic directions.

1. the name of the game tells you what the rule is.
2. No one is EVER TOLD what the rule is. Everyone must discover the rule for themselves.

During the play of the game, if you have a conjecture about what the rule is, write it down and let the leader know you have a conjecture. Please do not tell him or anyone else what your conjecture is. The leader will then allow you to test your conjecture by calling forthcoming throws of the dice or by placing the dice in any position you wish and tell you how many petals are showing. Once you have a conjecture about the rule which consistently gives the correct number of petals (direction (1) above) then you have won the game and you are reminded of direction (2) so others may also win. In this game, you play against yourself not against other players.

After your group has finished the game, exchange ideas regarding your efforts and difficulties. How did your thinking patterns change as you obtained more information and experience? What errors persisted in spite of your best efforts? When and what made order out of confusion? What would have made this game easier? Harder? How could you best teach this game to students?

Essay on Self-Regulation

Self-regulation is Piaget's all-encompassing term for describing how people gradually change their patterns of reasoning and advance from one level of understanding to another. In the present context, it can be paraphrased as "setting one's intellectual house in order." The process is one in which a person actively searches for relationships and patterns to resolve contradictions and to bring coherence to a new set of experiences. Implicit in this notion is the image of a relatively autonomous individual, or, at the least, a decision-making individual not under the constant guidance and control of a teacher or strict precedent.

In order to be more explicit about how self-regulation operates, we need to look in somewhat more detail at (a) the nature of schemes, (b) the processes of assimilation and accommodation involved in the functioning of schemes, and (c) the process of self-regulation by which old schemes are coordinated and transformed into new schemes.

As we indicated in Module 2, the fundamental units of knowing, for Piaget, are schemes. A scheme is a class of physical or mental actions one can't perform on a world, a potential transformation by which one is able to know the world. When a scheme "does its thing," we say that the individual is (a) assimilating reality to that scheme, and (b) simultaneously accommodating the scheme to reality. Thus, for example, you may bring a superposition scheme to a dice game (i.e. the total number is the sum of the spots showing on the top of the individual dice) and you try to assimilate the "Petals Around A Rose" game to that scheme. Simultaneously, while playing the game, you will accommodate your superposition scheme to the results of the game (i.e. the 5 spots and 3 spots yield 6 petals, not the 8 you expected.)

Knowing, then, for Piaget, also involves assimilating reality to the schemes one brings to the situation and a corresponding accommodation of those schemes to the thing-to-be-known.

Piaget, operating from what he calls a constructivist view of knowing, argues that knowledge is not preformed either in the mind or in the environment, but rather is constructed. Thus, intelligent knowing consists not of a primacy of either assimilation or accommodation, but rather of balance of the two. True understanding, for Piaget, consists of neither assimilation nor accommodation in isolation, but rather of a dynamic balancing of both that makes it possible to assimilate reality without distorting it and simultaneously to accommodate to that reality without compromising the integrity of present cognitive structures. Thus, for example, self-regulation with respect to the dice game maintains the integrity of both (a) the mental scheme of adding individual items to obtain a result and (b) the physical reality of the number of spots on the dice and their relation to the total number of petals showing.

The subtle but crucial concept of self-regulation provides the link between Piaget's views on how schemes function and his closely related views on how, during the course of their functioning, new schemes are constructed. Self-regulation is probably best understood when viewed within its biological context. Biologists have long understood that the functioning and development of an organism within its environment cannot be understood simply as the sum of the organism's effects on that environment (in Piaget's terms, its assimilation of the environment) and the environment's effect on the organism (that is, the organism's forced accommodations to the environment). Rather, it is the nature of living systems to maintain their internal coherence in the face of environmental intrusions via complex feedback mechanisms involving interaction between organism and environment. Piaget argues that cognition is another aspect of an organism's adaptation to its environment and thus involves analogous self-regulating mechanisms. In the face of new environments demands, then, the construction of new knowledge is not the accommodation of old schemes to the altered environment (as empiricists would have it), but the active construction of new schemes that maintain a balance between the assimilatory and accommodatory aspects of knowing. It is through such self-regulation that the active thinking student finds a path between on the one extreme of automatically assimilating educational input to present schemes (and thus distorting it) and on the other extreme of passively accommodating to educational input (and thus merely imitating it). Only in this way can the integrity of a person as a living, knowing self-regulating system be maintained. The ideal for the educator is to provide input that will not force distorting assimilations or blind accommodations but rather will facilitate the ongoing self-regulating process.

1. In what ways was the dice game a self-regulating experience for you?
2. How do you relate your experience with a the dice game to the experiences students have in your classes?
3. How do you relate self-regulation to your experiences with the mirror tasks?