A MEDIATIONAL TEACHING STYLE

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Nobody knows exactly how much of the effectiveness of an educational program is attributable to the curriculum itself and its materials, that is, *what* is taught, versus how much is attributable to the style of teaching, that is, *how* it is taught. There is, however, general agreement that teaching style has a significant and sometimes dramatic effect on curriculum outcomes. One of the five major components of *Bright Start* is the Mediational Teaching Style, and that is described in this paper.

There are at least 5 factors that make a significant difference in the effectiveness of any educational program. These include: (a) the content being taught; (b) individual differences in the learners; (c) individual differences in the teachers; (d) methods and materials; (e) the style of teaching. These factors are not completely independent of each other. The category "methods and materials" overlaps somewhat that of "style of teaching," and both considerations overlap "individual differences in teachers." In *Bright Start*, three of these factors represent areas of great change from what teachers might have been accustomed to in teaching under other approaches: content, methods and materials, and style of teaching. The content of *Bright Start* is, for the most part, a set of cognitive functions that we think necessary for operatory (symbolic, representational) thinking. The materials and specific methods are, for the most part, a combination of exercises provided in the curriculum set and some teacher-made materials that are only suggested. These are specified elsewhere. This paper is about the third area of significant change, the *mediational teaching style*.

The mediational teaching style is a direct derivative and expansion of Feuerstein's Theory of Structural Cognitive Modifiability (see paper entitled "Introduction and Conceptual Base," *Bright Start*). It is an application by teachers, in classrooms, of principles of adult-child interactions, referred to as "mediated learning experiences" (MLE) that are thought to be essential for the adequate cognitive development of children. Such interactions typically take place between children and such older members of their families as parents, grandparents, older siblings, and other caretakers. These interactions have the function of "mediating" the generalized meaning of the world to the children; that is, they help children to understand that events, objects, and persons have meaning beyond themselves, that the universe has (or needs to have) predictable structure, that understanding that structure helps one to know what to do in a wide variety of future situations, that it is possible to make explanatory rules that help one to organize observations, and that it is essential to test the applicability of such rules in a wide variety of circumstances. The intermediate-range goal of MLE is to acquire the fundamental cognitive functions that underlie the ability to learn effectively across many and varied content fields.

The role of parents in their children's cognitive development represents a major difference between the developmental theories of Piaget and those of Feuerstein (Arbitman-Smith, Haywood, & Bransford, 1980). Piaget gave scant attention to the role of child-rearing agents such as parents, grandparents, and teachers (although he certainly would not have denied that they are important--he just was not interested in

studying that area) (Haywood & Wachs, 1981), but in Feuerstein's view such persons play a central and critical role (Feuerstein & Rand, 1974). In fact, Feuerstein maintained that adequate cognitive development is not possible without some degree of mediated learning provided by parents and/or other caregivers. He presented a schematic diagram showing his idea of the "proximal" and "distal" etiologic conditions that lead to either adequate or inadequate development of the most fundamental cognitive functions (see Feuerstein, Rand, Hoffman, & Miller, 1980, p. 18). According to this scheme, the various conditions that have traditionally been thought of as "causes" of inadequate cognitive development, such as poverty, neurological impairment, emotional disturbance in child or parents, and low educational levels of the parents, are presented instead as correlates or "distal etiologic conditions." That means that even though inadequate cognitive development is found more frequently when those conditions are present than when they are not present, the conditions themselves do not cause inadequate cognitive development. Instead, the "proximal" (immediate) source of inadequate cognitive development is lack of adequate MLE. The correlation arises because these distal etiologic conditions, or correlates, are often, but not necessarily, associated with inadequate MLE. Feuerstein et al. (1980) contended that when MLE is sufficient for the individual needs of particular children, adequate cognitive development will be the result, and that when MLE is not sufficient, inadequate cognitive development, and the syndrome of "cultural deprivation," (see discussion below) will be the result. Thus, Feuerstein et al. (1980) suggested that adequate cognitive development can occur *in spite of* such "distal" conditions as poverty, neurological impairment, intellectual disability, emotional disturbance, and low educational levels, when there is adequate mediation of the most fundamental cognitive functions to the children by more competent older persons. Further, they have suggested that inadequate cognitive development may occur in spite of favorable circumstances with respect to these "distal" conditions, that is, in favorable economic circumstances and in the absence of neurological impairment, intellectual disability, emotional disturbance, and low educational levels, when MLE is not sufficient to meet the individual developmental needs of particular children.

Figure 1 is a schematic representation of the proximal and distal etiologic conditions in cognitive development, according to Feuerstein.

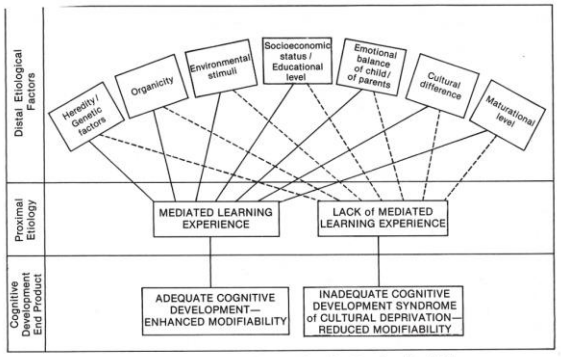

Figure 1. Distal and proximal etiologies of differential cognitive development. (Adapted from Feuerstein and Rand, 1974.)

The condition of poverty is a good example of this correlational relationship. Haywood and Stedman (1969) noted that over 80 percent of all persons with mild intellectual disability come from "poor" families, so one might be tempted to conclude that poverty causes mild intellectual disability. At the same time, these authors also noted that only 10 percent of children from poor families are ever identified as mentally retarded. If 90 percent of families in which the condition of poverty is present produce children whose intellectual functioning is above the cutting point for the diagnosis of intellectual disability, then it would be quite illogical to argue that poverty causes mental retardation. It is also true that 10 percent of children from poor families do get identified with intellectual disability, and that is more than three times the prevalence in the population as a whole. Thus, while poverty does not cause intellectual disability, it is clear that

the social circumstance of poverty may contain some elements (positive or negative) that bring about a correlation (in this case, a greater likelihood of occurrence). The position of Feuerstein et al. (1980) is that the correlation is brought about by the fact that adequate mediated learning experience is less likely to be provided, for a variety of reasons, when families are economically and socially disadvantaged than when they are economically and socially secure.

It is clear, then, that "adequate" MLE is a critical condition for adequate cognitive development, according to Feuerstein's position. That being the case, one might well ask "How much MLE is enough?" The answer is that it depends on the individual needs of children. Haywood (1986) has made a sharp distinction between "intelligence" (native ability, relatively fixed and constant, largely genetically determined) and "cognitive processes" (modes of logical thought, must be learned, can be taught, highly modifiable through teaching), and this distinction can be helpful in understanding this relationship. Feuerstein et al. (1980) suggested two ways in which basic cognitive processes are acquired: (a) through "direct exposure" learning, that is, they can be learned without external mediation through children's direct successive encounters with environmental events; (b) mediated learning experience, that is, through the mediation (by adults) of the generalized meaning of those events. Every child, no matter how "intelligent," must acquire the basic cognitive functions in order to think logically, perceive the world in structured, orderly, and reasonable ways, know how to learn, and apply his/her intelligence to new learning and problem solving situations without further need of mediation. Children who are genetically (or otherwise) destined to have relatively high intelligence may acquire a larger proportion of their basic cognitive functions through direct exposure learning than do children of initially lower intelligence, and further may require less frequent, less repetitious, and less intense MLE in order to acquire their basic cognitive functions. On the other hand, children who have relatively lower intelligence, or who have special handicapping conditions such as limited vision or hearing, may learn less through direct exposure to environmental events, thereby demonstrating a greater need for MLE, and further may require more frequent, more repetitious, and more intense MLE in order to acquire their basic cognitive functions. The developmental question with such children is not *whether or not* they can acquire important thinking modes and processes, but *how much* mediated learning experience, of what kinds, over what period of time, will be necessary in order for them to acquire these processes. To the extent that such MLE is available, the cognitive development of these children will be more nearly adequate than it would have been with less MLE. Failure of either group of children to get adequate MLE will result in inadequate cognitive development, the "syndrome of cultural deprivation," a greater discrepancy between their performance and their potential than would have been necessary with more MLE, and less effective learning of both academic and social content than would be potentially possible for them.

Feuerstein has referred often to the "syndrome of cultural deprivation." One must be careful to distinguish his use of this term from the widely understood definition of the 1960s. Between 1960 and the early 1970s, American developmental psychology and early education were characterized by enormous optimism about the possibility of raising intelligence through education, especially early education, and by the notion that some cultures and subcultures were inherently "depriving" with respect to some of the necessary components of "good" childrearing environments. Children who were reared in such cultures and subcultures were seen as "culturally deprived," meaning

that their cultures had deprived them of essential developmental experiences, and that it would be somehow necessary to "compensate" for those lacks. Feuerstein has maintained that such a notion of cultural deprivation is false and misses the essential point. He asserts that every culture and subculture that has been around long enough to warrant the name contains all the social elements that are essential for adequate cognitive development. In the vast majority of families, these elements are transmitted to the children through a broad set of processes that he calls "intergenerational cultural transfer," i.e., the passing of a culture's essential elements from one generation to the next, a process that relies heavily on MLE as its chief tool. It is when environmental events interrupt that transfer, that is, when children are somehow denied the benefits of their own culture, that the children can be regarded as "culturally deprived." Thus, culturally deprived children, rather than having been denied essential developmental events by their cultures, have instead failed to receive those events even though all essential elements are present in their cultures. It is failure to get adequate mediation of culture-characteristic ways of perceiving and organizing the world, thinking about thinking, and defining and solving problems that constitutes the syndrome of cultural deprivation. The optimistic side of this view is that, since all the essential elements are present within one's culture, deficiencies in their transmission can be made up by subsequent mediation. That often becomes the role of teachers.

It is possible to summarize the important points about MLE from a combination of Feuerstein's Theory of Structural Cognitive Modifiability and Haywood's (2010) transactional perspective on the nature and development of intelligence. The following list contains the essential points.

1. Intelligence itself is relatively constant, and efforts to change it by education yield only modest increases as a result of substantial investment.

2. Intelligence alone (defined as "native ability") is not a sufficient condition to provide for effective perception, thinking, learning, and problem solving.

3. There is a finite number of fundamental processes of thinking that, combined with certain affective, motivational, and attitudinal factors and particular habits of intellectual work, constitute "basic cognitive functions" and are necessary for effective systematic perceiving, thinking, learning, and problem solving.

4. The basic cognitive functions must be acquired (that is, are not genetically "given"), and they are acquired through experience.

5. Cognitive learning is of two kinds: direct exposure to environmental events, and mediated learning experience (MLE).

6. Some MLE is necessary for all children, but the amount, quality, intensity, frequency, and duration of what is needed for adequate cognitive development will vary as a function of individual differences in children (for example, genetic intelligence levels, sensory integrity, emotional stability, environmental support).

7. When MLE is inadequate to children's individual developmental needs, the result is inadequate cognitive development, the "syndrome of cultural deprivation," and relatively ineffective academic and social learning.

8. When MLE is adequate to children's individual developmental needs, the retarding effects on academic and social learning of such conditions as poverty, mental retardation, emotional disturbance, and low parental educational levels may be significantly offset. The result is a higher level of cognitive development and relatively more effective academic and social learning.

9. Providing MLE is an essential role of parents, grandparents, and older siblings in a process of intergenerational cultural transfer. This process is repeated in every culture, and all cultures have within them the essential elements for adequate cognitive development of their children. Failures of transmission of culture-characteristic modes of thinking constitutes the syndrome of cultural deprivation.

10. When some aspects of cognitive development have not been stimulated adequately through MLE, it is possible to mediate those aspects at later ages through carefully constructed teaching. In other words, opportunities that might have been missed by parents can be picked up by other teachers.

11. The mediational processes can be described and replicated, and these processes constitute an identifiable and important style of teaching: the mediational teaching style.

Qualities of Mediated Interactions

According to Arbitman-Smith, Haywood, and Bransford (1984), "Mediating the learning experiences of children... includes, but is not limited to, such functions as stimulus selection (helping children to reduce the number and complexity of available stimuli by attending selectively), focusing on relevant aspects of a stimulus complex, repeating exposure to important stimuli, perceiving and understanding similarities and differences, sequential relationships, dimensionality, antecedents and consequences, commonalities in experience, and such operations as comparing, categorizing, relating past, present, and future, and grasping the concept of generalizability of experience to new situations" (p. 434). In addition to those rather broad functions, mediators: (a) supply the information that may be needed to learn relationships or to find solutions; (b) ask questions, that is, elicit rather than give answers; (c) guide children's learning by arranging and directing sequences of experiences in a developmental fashion; (d) bring about induction of explanatory rules by calling attention to similarities among isolated events; (e) guide deduction of applications of rules; (f) build the confidence of the children by communicating belief in their competence as thinkers; maintain a *metacognitive* emphasis, that is, focus attention on the children's own thinking processes and encourage them to do so. In doing these things, mediators make use of several quite specialized strategies, including *process questioning, bridging, challenging* (requiring justification), *teaching about rules*, and *emphasizing order, predictability, system, sequence, and strategies*. The following is a non-exhaustive list of techniques of mediation used by parents and other teachers:

1. Focus on processes rather than on responses.
2. Ask questions.
3. Ask process questions, that is, elicit process answers.
4. Require justification, even for correct answers.
5. Communicate enthusiasm for learning.
6. Use task-intrinsic incentives.
7. Bridge principles to many familiar content domains.
8. Relate new to familiar experience.
9. Elicit rules.
10. Elicit induction of rules.
11. Elicit deduction of rules.
12. Emphasize the need for order structure, and predictability.
13. Create anxiety around imprecision, inaccuracy, and lack of logical evidence.
14. Establish logical habit structures.
15. Accept as much as possible of children's responses, but correct inaccurate

or incomplete responses.

A teaching style is concerned not only with what one teaches but primarily with how one teaches it. Every interaction between an adult and a child has some potential for being a mediated interaction, that is, for being generalized beyond the content of the immediate situation. Whether or not a given interaction will be useful in promoting the cognitive development of children will depend upon the quality of that interaction. Feuerstein suggested a number of criteria of mediated learning interactions. From this list we present here the first six criteria and suggest that they are the most important. Every interaction can be examined to determine to what extent it reflects each of the six criteria. Awareness of these criteria will encourage parents and other teachers to try consciously and deliberately to construct their interactions with children in such ways as to reflect these criteria.

Intentionality. In mediated interactions the mediator intends to use the interaction to produce cognitive change in the child. Content situations (for example, need to know color names, wish to understand how birds fly) thus become vehicles for the teaching and learning of concepts and principles of thought, which produces cognitive change in the child.

Transcendence. The mediator tries to produce structural cognitive changes in the child, that is, changes that transcend the immediate situation. An event could be seen as only an isolated event, but a mediational teacher will give such an event transcendent (generalized) meaning by attempting to relate the event to previous and even future events of a similar nature, and thus to extract a generality (explanatory rule).

Communication of meaning and purpose. Mediators do not have cognitive or strategic secrets from children. It is important to let the children know why one is doing any particular activity, that is, in order to produce structural cognitive changes in the children. Mediators communicate both the immediate (content) meaning of events and their generalized relationship to other events (e. g., "Why do you think it is important for us to do this? Yes, so we will have a plan, and know what to do as we go along!").

Mediation of a feeling of competence. Children's feelings about their own competence as learners are extremely important. Mediators communicate about this in two specific ways. The first way is to reward appropriate responses, especially process-oriented responses, with acceptance, acknowledgement, praise. The second is to be certain that the children understand exactly what aspects of their behavior were good and should be repeated. Thus, a mediator does not stop at saying "Good!" when a child has done well, but might say something such as "Good! You made a plan, so now you know what to do as you go along."

Regulation of behavior. Children, especially young children, often require some regulation of their behavior in order to demonstrate their cognitive competence. A very common source of errors in intellectual work is impulsive responding, that is, giving answers before one has had time to examine the questions and the possible solutions. A good mediator helps children to inhibit their impulsive responding and thus to improve the quality of their responses. Another manifestation of need for regulation of behavior is inability or unwillingness to respond even when the mediator knows that responses are available to the children. Good mediators help children to "unblock" available responses, to be willing to give answers, by creating an affectively safe and expectant environment.

Shared participation. Mediators convey the attitude that they and the children are engaged in a shared quest for structural cognitive change in the children. Each has an identifiable and separate role, but each is a participant and shares in a "We're in this

together and you can count on me to do my part" manner. The interaction, then, is not one-way, and while it is directive it is neither authoritarian nor patronizing.

Mediated interactions differ demonstrably from non-mediated interactions in several ways. First, of course, mediated interactions are characterized by the criteria discussed in the preceding paragraphs. Second, mediated interactions are strongly process-oriented; that is, the dialogue between child and adult is focused on generalizable processes of thinking and learning rather than on answers to immediate problems in immediate situations. Third, mediated interactions display mediators' confidence in children's ability to learn and apply appropriate thinking modes and strategies. In contrast to many kinds of nonmediated interactions, mediated ones constitute true dialogue, that is, a "two-way street" in which information is sought by each participant from the other and the unique role of each participant is recognized. These distinctions are both conceptual and empirical. At the empirical level, Dale and Cole (1986) carried out a systematic comparison of an early version of *Bright Start* (Haywood, Brooks, & Burns, l986) and DISTAR (Becker, Engelmann, & Thomas, 1975; Becker, 1977), the latter a content-oriented curriculum whose teaching style is substantially behaviorist. The two curricula differ markedly in concept and approach, but these authors asked to what extent they differ in actual implementation; that is, they wanted to know to what extent observers could distinguish the two approaches on observational criteria. First they developed 14 categories of teacher and child behavior on which the programs were expected theoretically to differ. Observers were trained, and made their observations according to strictly prescribed protocols. There were significant differences on 9 of their 14 categories, all in the expected direction. DISTAR exceeded Bright Start in frequency of: eliciting verbal imitation, eliciting unison responding, limited-response questions, "labeling" questions, and immediate correction (reinforcement). *Bright Start* exceeded DISTAR in frequency of: process presentation by the teachers, process generalization, process questions, and open-ended observation questions. The researchers commented that "It is certainly true that the difference between the programs is clear virtually immediately on entering the classrooms." Thus, there is evidence that teachers who have been well trained in the mediational teaching style do indeed behave in their classrooms in ways that are conceptually consistent with the requirements of that teaching style, and that their classroom behavior is visibly different from that of teachers trained in a different teaching style.

Unique Character of Teacher-Mediated Interactions. What teachers do by way of mediation of cognitive functions in classrooms is indeed a way of compensating for inadequate MLE in home situations, but the two are not the same. That is to say, when mediation takes place in home and family settings, and is done by primary child-rearing agents, it is of a different quality than when it is done in classrooms by teachers. Some of the differences should make it possible to realize more efficient gain from the classroom procedures.

1. Since the efforts of teachers occur later than do the primary efforts of parents, the children are more competent, presenting a developmentally more complex set of abilities, habits, attitudes. and expectations as well as a richer accumulation of experience. This important difference means that teachers may move at a more rapid pace, that they can draw on a richer and more varied store of familiar experience in the children (to which they can bridge cognitive concepts), and that the children themselves can be counted on to participate

more actively and confidently.

2. Family mediators rely upon naturally occurring situations as opportunities to mediate, but classroom teachers, having many children to whom they must mediate at once, typically construct their own opportunities to mediate. The contrived situations used by classroom teachers allow the teachers to control the parameters of mediational situations, to set clear mediational goals, and to sequence the children's cognitive learning in developmental ways.

3. Family mediators, relying on naturally occurring situations, use relatively "concrete" situations, and must make the effort to extend the meaning of these in cognitively generalizable ways. Classroom teachers, using contrived and structured situations, go more directly to representational thought; in fact, their "bridging" is done frequently to other "concrete" or real-life situations when the same cognitive functions are required or useful.

4. Classroom teachers make use of the social situation of having many children of similar developmental age at once, while in families there is only rarely more than one child of a given developmental level. The presence of other children can be a powerful advantage in the mediational process, since the children sometimes understand other children's examples and experience more readily than they understand the experience of adults, and there is a certain amount of social facilitation in the learning process. Of course, these same phenomena can work to the disadvantage of classroom teachers when the social interactions are negative or destructive.

5. In general, classroom mediation is more structured, more clearly teacher directed, more focused upon specific cognitive goals, and more concentrated (in the sense that similar cognitive functions are being emphasized throughout the day in a cognitive classroom) than is true of family mediation.

The Most Useful Mediating Mechanisms

We suggested earlier 5 mechanisms of mediational teaching that are used frequently and that are thought to be especially useful in helping children in classroom settings to acquire developmentally important thinking processes. These are discussed in succeeding paragraphs.

1. *Process questioning*. This is the single most frequently used mechanism in a cognitive classroom. Teachers ask many questions, and their questions are very often of a process nature. This means that they ask "how" questions: "Yes, but how did you know?" "How else could you do that?" "What must you do first, and how can you find out what to do next?" This mechanism is extremely important as a *metacognitive* tool, that is, it helps to focus children's attention on their own thinking processes and encourages them to engage in similar "small conversations" with themselves.

2. *Bridging.* This is the process whereby teachers encourage children to think of different applications of the thinking processes and strategies they have been discussing. It is cognitive functions that are bridged. Content may also be bridged, but in a cognitive curriculum the bridging of cognitive functions is more important. Thus, if one is teaching "comparing on multiple dimensions," a teacher might ask the children to nominate other situations (than the ones introduced in the lesson) when it is important or helpful to compare on more than a single dimension. It is probably true that the learning of a concept or principle of thought does not take place merely in the verbalizing of the principle (although there is evidence that that helps!) but in the children's successive attempts to apply the principle in a variety of different situations and applications. Because we as human beings are capable of representational thought, actual trying out of

thinking principles in varied real situations is not completely necessary; we can "try out" applications symbolically, by imagining them and by discussing them. The following principles should govern the use of bridging as a mediating mechanism: (a) "Bridges" should be elicited from the children, not told to them (although some "pump priming" is often necessary), (b) Bridges should be to events and circumstances that are familiar to the children. (c) Bridging examples should be simple and straightforward, not complex and logically tortured. (d) Bridging examples should be elicited in several domains of experience, especially other school contexts, home situations, and peer group interactions.

3. *Challenging, or requiring justification*. At first glance, this mechanism might seem to have the potential for decelerating participatory behavior in children. Good mediational teachers establish the habit of challenging both correct and incorrect responses. Challenging must be accompanied by the rule of accepting as much as possible of children's responses (the "Yes, but..." mechanism). One might say, for example: "Yes, you are right, it could be that way. You could also look at it another way, and maybe find an even better answer." Challenging a correct answer conditions the children against the expectation that a challenge by the teacher means that their answers are wrong. A "correct" challenge might be: "Yes, that's right. How did you know that should be the answer? Why is it better than this one? What would be wrong with this one? Could you show me/tell me how you thought about that and found the right one?"

4. *Teaching about rules*. This is a critical aspect of generalizability. The idea, of course, is that if one can make an applicable rule one will know what to do in future similar situations. The children themselves should be asked often to generalize: "Can we make a rule about how to do this kind of problem? If redbirds have feathers, bluebirds have feathers, eagles have feathers, grackles have feathers, and sparrows have feathers, can you think of a rule about birds? Does it apply to hawks? To penguins?" In addition to such rule making, mediational teachers should ask the children to comment often on the general utility of rules: "Would it help us to have a rule here? How? How could we make one? Who can tell me two different times when we need to have rules in order to know what to do?"

5. *Emphasizing order, predictability, system, sequence, and strategies*. This one is quite important but perhaps a bit more difficult to define in operational terms. The general attitude of mediational teachers should be that there is order in the universe, that events are predictable if one understands the rules and has enough information, that events, objects, and even persons are arranged in systems, that the order in which one looks at or does things is important, and that problem solving is often primarily a question of finding the most effective strategy. These attitudes are mediated throughout a CogEd day, beginning with planning time and ending with summary time, both of which serve to emphasize the orderliness and predictability of the universe as well as the satisfaction of placing events in agreeable sequence. Within any interaction during the day, these elements can be injected into a discussion on almost any topic. Of course, many children live in environments in which there is little order, structure, or predictability. The point here is that teachers help children to understand that they themselves can impose logical order on an otherwise chaotic universe.

There are as many specific ways to mediate cognitive functions to children as there are good mediators. In fact, good mediators use their own personalities and the feedback they get from the children to regulate their behavior and to select

mediational strategies, rather than memorizing particular mediational sequences and using those over and over with children. Nevertheless, we have observed many good mediators and have extracted from those observations a list of the words and phrases most frequently used in CogEd classrooms. That list follows:

1. What do you need to do next?
2. Tell me how you did that.
3. What do you think would happen if ___?
4. When have you done something like this before?
5. How do you feel if _____ ?
6. Yes, that's right, but how did you know it was right?
7. When is another time you need to ___ ?
8. Stop and look carefully at what you're doing.
9. What do you think the problem is?
10. Can you think of another way we could do this?
11. Why is this one better than that one?
12. Where have you done that before to help you solve a problem?
13. Let's make a plan so we don't miss anything.
14. How can you find out?
15. How is ____ different (like) ___?

References

Arbitman-Smith, R., Haywood, H. C., & Bransford, J. D. (1984). Assessing cognitive change. In P. Brooks, R. Sperber, & C. M, McCauley (Eds.), *Learning and cognition in the mentally retarded* (pp. 433-471). New York: Erlbaum.

Becker, W. C. (1977). Teaching reading and language to the disadvantaged – What we have learned from field research. *Harvard Educational Review, 47,* 518-543.

Becker, W. C., Engelmann, S., & Thomas,D. R. (1975). *Teaching 2: Cognitive learning and instruction*. Chicago: Science Research Associates.

Haywood, H. C. (1985, 2017). Teachers as mediators. *The Thinking Teacher, 2*(5), 7-8; reprinted in *The Thinking Teacher*, 2017).

Haywood, H. C. (2010), Cognitive education: A transactional metacognitive perspective. *Journal of Cognitive Education and Psychology, 9*, 21-36.

Dale, P. S., & Cole, K. N. (1988). Comparison of academic and cognitive programs for young handicapped children. Exceptional Children, *54*, 439-447.

Feuerstein, R., & Rand, Y. (1974). Mediated learning experiences: An outline of the proximal etiology for differential development of cognitive functions. In L. G. Fein (Ed.), *International understanding: Cultural differences in the development of cognitive processes*. (Pp. 7-37). New York: International Council of Psychologists.

Feuerstein, R., Rand. Y., Hoffman, M. B., & Miller, R. (1980). *Instrumental Enrichment*. Baltimore: University Park Press. (See revised edition, Jerusalem: ICELP Press.)

Haywood, H. C., Brooks, P. B., & Burns, S. (1986). Stimulating cognitive development at developmental level: A tested, nonremedial preschool curriculum for preschoolers and older retarded children. In M. Schwebel & C. Maher (Eds.), *Facilitating cognitive development: Principles, practices, and programs*, pp.

127-147. New York: Haworth Press. (Also published in *Special Services in the Schools*, 1986.)

Haywood, H. C., & Stedman, D. J. (1969). *Poverty and mental retardation*. Staff position paper prepared for The President's Committee on Mental Retardation. Washington: President's Committee on Mental Retardation. (Available from first author.)

Haywood, H. C., & Wachs, T. D. (1981). Intelligence, cognition, and individual differences. In M. J. Begab, H. C. Haywood, & H. Garber (Eds.), *Psychosocial influences in retarded performance.* (Vol. I: *Issues and theories in development*.) Baltimore: University Park Press.

ILLUSTRATIONS OF MEDIATIONAL INTERACTION

The following interaction between a cognitive education teacher (T) and 6 preschool children (C1 to C6) illustrates the mediational teaching style as applied in the context of a classroom activity. In this group activity, the children are sitting in a circle on the floor.

T Let's talk about some of the games we've played at this circle before. Wait a minute. Everybody's talking at once. What happens when everybody talks at the same time?

C1 Too much noise!

T That's right. When everyone talks at the same time, there is too much noise and I can't hear what you're trying to say to me. So what should we do?

C2 Don't talk.

T Well, talking is okay if we don't all do it at the same time. What is a good rule about talking when we're together in our group?

C3 Raise our hand.

T Good, (name). If you raise your hand I'll know you want to say something and you can have a turn to talk. Now let's talk about some of the games we have played at this circle before. Who can tell me which games we have played?

C1 (raises hand)

T C1?

C1 Busy Bee and Copy Cat and Fast and Slow

T Busy Bee, Copy Cat, and Fast and Slow, that's right. You know all the games and you remember their names.

C4 And Leap Frog.

T Yes, we've played Leap Frog, too. But now we're talking about the games that we've played here at the large group circle. How are the rules and the materials different for each of these games? Are they the same?

Cl No.

T Are they the same games?

Cl No.

T No. C5, how are they different?

C5 I don't know.

T Okay. It's good to say "I don't know" when you don't know the answer. Who can tell how the games are different?

C2 (raises hand)

T C2

C2 'Cause there's different rules.

T There are different rules for each game, that's right. What do the rules tell us?

C2 What to do.

C5 They tell us to change circles.

T You need to change circles. Only when, though?

Cl When you hear "Busy Bee."

T Only when someone says "Busy Bee," that's right. And that's one of the rules. What do the rules tell us, C6?

C6 What to do.

T What to do, that's right. They tell us what to do. You know the rules for all those different games, so you know how to play all those different games. We only have time for one game today. So we need to choose one game.

Cl I want to play Busy Bee.

T Okay, raise you hand if you want to play Busy Bee. (4 children raise hands)

C5 I want to play Copy Cat.

T (counting hands) 1, 2, 3, 4. (To C1) Okay, can you remember that 4 children want to play Busy Bee? Whoever wants to play Copy Cat, raise your hand.

C5 (raises hand)

T And what game would you like to

play, C6?

C6 Fast and Slow

T You know what? Four children raised their hands for Busy Bee, so we're going to play Busy Bee today. But before we play, what do we need to play Busy Bee? C1, can you tell me what we need to play Busy Bee?

Cl We need rope.

T We need rope, that's right.

C6 I wanna play Fast and Slow.

T Well, you know what, C6? We took a vote and most children wanted to play Busy Bee.

C4 C6! C6! (clapping and laughing)

T It's too noisy in here.

Cl (pointing to C4) That's noisy.

T C4's really being noisy.

C2 We can't hear.

Cl I can't hear.

T That's right, we cannot. That's why we have the rule about being quiet at the circle.

C4 (claps and laughs)

C2 I can't hear.

T C2 can't hear. That's not fair to C2.

C6 Neither can I.

T Right. And then we waste a lot of time because we have to wait until it's quiet, and then we run out of time, don't we?

Cl Yeah, yeah, yeah.

T We don't get all of our activities done. You just chose from three games. You chose the one that you wanted to play. When else can you choose? When else do you choose activities to do? C1, when else?

Cl On the playcourt.

T Good. You can choose what you will do on the playcourt. What are things you could choose to do?

C3 Hide and seek!

C5 Run!

T That's right. You could choose to run or jump, climb the bars, or play a game like Hide and Seek.

The following activity, a portion of a Planning Time activity, is directed by a Cog. Ed. teacher (T) utilizing a "planning board" with nine students (C1 - C9).

T C1, could you help me? We're having problems with our planning board this morning. There we go... thank you. We need to look at our chart and see whose turn it is today to do our jobs.

C2 Me!

T Where do we need to look?

C2 Me!

T Well, C2, we need to look down our chart and here's our clip. What did we say the clip helps us to do?

C4 Remember where we left off.

T Yes, and what do we call the clip? Who remembers what I told you yesterday? We call it a .....

Cl Clue!

T That's right, C1. We call the clip a "clue" because it reminds us who had a turn the last time. Today, our special thought is about using clues to help us to know what to do. Can we call this clip a clue?

C5 Yes!

T O.K., do you want me to move over so you can see our planning board better? "C8 and C9, can you see better if I move this way? How is this? So if you look now at the clue, who had a turn yesterday?

C6 C2!

T C2 had her turn yesterday, that's right, C8. And so we know that we need to go which direction?

Cs Down.

T We need to go down...and it says....

Cl Cl's turn.

T Oh, I'm glad! Cl hasn't had a turn for a long time. How did you know it said

"C1"?

Cl Because that's my name. B R I A N.

T Oh, you've seen it before, so you knew that it was your name. Very good, C1.

C9 Tomorrow, I'm gonna have a turn.

T Well, how do you know it's going to be your turn tomorrow, C9?

C9 We have to go all the way up again!

T Oh! We have to go all the way up again. So when we are done with the bottom, what do we have to do?

Cs Go up. Go to the beginning.

T Yes, we have to start from the beginning again.

C3 We have got to go in order.

T C3, why do we go in order?

C3 So we don't miss something.

T And if we miss something, what would happen?

C3 I might miss my turn.

C5 No, me!

T Wow, C3, you are really thinking this morning. You know that if we don't go in order, we might miss something. What other times do we need to go in order?

Cl Outside....on the playground...when we want to swing.

T Yes, that is a problem isn't it C1? There are only 2 swings and there are 12 children, so we need to take turns by going in order. C7, what is something you do in order at home?

C7 I don't know.

T Try one more time. Stop and think. What do you do at home in order so that you don't miss something? (pause) Can anyone help C7?

C5 (C5 imitates doing the dishes)

T O.K., very good. C7, do you see the clue that C5 is giving you?

C7 Washing dishes.

T What happens if you don't go in order when you wash the dishes?

C8 You might break one.

T Yes, I think anytime you do the dishes you might break one, but what might happen if you just did whatever dishes you wanted?

C8 You would forget it... you would forget to wash a plate.

T You might forget to wash some of the dishes. Very good! (C1 has begun to move to the fish aquarium to feed them.) Can you get back there? Let me help you get a chair so you can stand up and feed our fish. Do you remember what happens when we slam the lid down on the aquarium?

C4 You scare them.

T It kind of scares them, doesn't it? So what do we need to do? Do you think the fish are hungry today?

Cs Yes!

T How can you tell? (pause) How can you tell the fish are hungry?

Cl Because they go right up to the top!

T Yes, because they go right up to the top and begin eating the food. I think they are hungry. (T and Cl go back to group) 0.K., C1, let's get the calendar out and see if you can tell me what day it is.

Cl (pointing to day) This day.

T Do you know what number that is?

Cl It's a six.

T How do you know that is a six?

Cl One..you need to count!

T O.K., that's a good way to find out what day it is. How did Cl know that this was a six?

C4 He counted!

T A lot of times there is more than one way to figure things out. There is another way to figure out that this is a six. Who can tell me another way?

C7 Cause it looks like a six.

T Good, C7! When you look at the number six, how do you know that this is a six? (pause)

C7 Cause you have to look at it!

T Well, sure, but how do you know it is not a ..one?

Cl A one is straight and a six is curly.

T All right. A nine is also curly. How do

you know that this number is a six and not a nine?

C3 They are different. They look different.

C5 The curly round part is on the bottom to make a six.

T Very good, C5, the curly part is in a different place for different numbers. Can we say that the curly part, if you look carefully, will give you a "clue" to help you know that it is a six?

Cs Yes.

T Great! 0.K., so what day is today?

Cl One...two, three, four, five...six! Today is the sixth day!

T Today is the sixth day, yes, C1.

C9 Six, seven and Santa. They all have the "sss" sound at the beginning.

T You are really thinking, C9! Yes, all of the words six, seven and Santa begin with the "sssss" or "s" sound, don't they? Does anyone's name in our class begin with the "s" sound?

C7 Samisha does.

T Samisha, good.

C9 And James has an "s" sound in it, only it's at the end!

T Yes, there is an "s" sound in James but instead of being at the beginning, like Samisha and Santa, it is at the end..., Jamesssss.

Cl (Still concerned about finishing his turn with the calendar) Do we have a fog picture?

C8 Cloudy!

T We can use a cloudy picture because it's kind of the same thing. (C1 searches for the picture illustrating a "cloudy" day) So Cl figured out by counting what day comes next and then he decided that he needed a special "foggy" day picture. Well, we didn't have a picture with fog, but we use the picture with clouds because they kinda look like the same thing.

C3 But it's sunny and foggy?

T So what can we do?

Cl Put both kinds on the day.

T Can we use two kinds of weather? (pause) Sure! Sometimes the weather changes during the same day, doesn't it?

C4 My Daddy brings the umbrella to work every day just in case it rains.

T You know what, C4, I bring my umbrella to work sometimes too. Do you know why?

C5 It might be raining.

T I bring my umbrella to work when it is raining, but sometimes it is sunny or a little bit cloudy and I STILL bring my umbrella. Something gives me a clue that it might rain. Can you tell me what that clue is?

C9 The weatherman on the news!

T That is one clue, yes. Can anyone think of another one?

C2 Sometimes when it's sunny and then it gets cloudy you know it's gonna rain and you have to close the windows!

T So what did you do, C2, to decide that you better get ready for rain? (pause) You had to...

Cl Look at the sky.

T Yes! You had to look carefully at the sky. There are many times you need to look carefully at things to get a clue. 0.K.,....

C4 Sometimes when the sprinkler is on I think it is raining out and then I found out that it tricked me.

T So next time you know that you need to look....

Cs Carefully!

T O.K., C1, we need to find out what day it is today. How can we find out what day of the week it is?

Cl You can ask someone.

T O.K., you could ask someone, but what could YOU do to find out? If you look at our calendar and you know that this is Sunday, what could you do?

Cl And I didn't know what the next day

was? I would say "Monday."
T	So you went in....
Cl	Order! Sunday, Monday, Tuesday, Wednesday, Friday....
T	Thur...Let's try it again; we might have missed a day. Sunday...
Cl	Monday, Tuesday, Wednesday, Fri....Thursday, Friday, Saturday, Sunday!
T	Good! So we have figured out that today is Thursday and who remembers the month?
C7	December.
T	So today is Thursday, December 6th. Six days in December. All right, so who can tell me what we need to do now? What happens next in our classroom?
C2	After planning time we go to small group work.
T	That's right and what do we need to look at to get a clue about who will be in the groups today?
C4	The chart on the wall.
T	All right, and it tells me which kids are in groups together and what teacher will be with them. So if we look....
Cs	Carefully!
T	If we look carefully, we will know which group we will go to.

- -

The following interaction between a cognitive education teacher (T) and eight preschool children (C1 to C8) illustrates the mediational teaching style as applied in the context of an unstructured classroom situation, lunch-time conversation. This example is intended to illustrate that the use of mediation permeates every classroom activity and to show that this style is a way to teach whether or not curriculum content is being taught directly.

A. Lunch Preparation:

T Now that we have finished large group, who can remember what we need to do next?

C3 We eat lunch.

T Good, C3, you remembered that we have lunch right after large group. How do you know that?

C3 Cause every day we have lunch then.

T Good! You know when we have lunch because we have done this before.

C2 And we have to put the things on the table and the napkins.

T C2, you are thinking about the things we need to have before we can eat lunch, like the napkins and the...

C1 Forks. And what else?

C1 A spoon and the knife.

T We use spoons at school. Where do you put knives on the table?

C4 My momma does...at my house.

T Is there anywhere else you will find a knife on the table?

C2 At Denny's.

T Yes, C2, restaurants put knives on the tables. What do we call it when we put all these things on the table?

C2 Set the table. I want to set the table.

T Whose turn is it to set the table?

C1 Not me.

C3 I don't know.

T All right, C3, it's 0.K. to say "I don't know" when you don't know the answer. But how can we find out whose turn it is? (pause) How did we know whose turn it was the last time we set the table?

C2 We took turns.

T O.K., when we take turns, we have to go in...

C2 Order! "

T Yes, C2, we know whose turn it is because we take turns in order. Very Good! So if C2 was the last one to set the table, whose turn is it next? (C4 raises hand) Right, and how did you know that, C4?

C4 Because my turn is after C2 and that's when I get a turn.

(The T and children begin to move and prepare for lunch and join the other students who have been working on independent activities.)

T C4, how do you know how many plates and forks to put around the table for lunch? What do you need to know?

C1 You gotta know who's gonna eat at lunch.

T Well, you're right, C1. We have to know who's eating lunch in order to know...(pause). We know who will eat lunch with us today...and to set the table we need to know how many...

C3 ...people...to count!

T We have to count the people in our class. Good, C3. What other times do we count things to find out how many?

C7 I count my money. I've got lots of money...

T O.K., good, you need to count your money. Is there anything else you need to count? (pause) What other things do we count in our classroom?

C6 We count in a game. You gotta go a lot of spaces and you have to count them.

T Very good, C6. When we play a game with the spinner or with the dice we need to count the number we get and move the marker. All right, well it

looks like C4 is finished setting the table for us.

B. Eating Lunch:

C5 I need some bread!

C7 I need some too!

T It sounds like we need to pass the bread. Oh, look in the basket. How many pieces of bread are there?

Cl One.

T How many kids want bread?

C3 Two.

T Does anyone see a problem with this?

C5 There isn't gonna be enough bread.

T How are we going to solve this problem? What can we do? We have two children who would like more bread and there is only one piece of bread left. What can we do?

C5 I asked first.

T Do you think there is another way to solve this problem?

C6 You could get more.

C7 No, share!

C8 You need to share the bread.

T It sounds like there are a few different ways to solve the problem. C5 asked for the bread first. If I give him the bread, how will C7 feel?

C5 Hungry!

C2 Sad!

T I think you are both right! C7 will still be hungry and he might feel sad. C6 says that we could ask for more bread from the kitchen, but it is a little too late to ask for more. What was the other suggestion that C7 and C8 had? That we could share.

C8 They should share so that they can both eat.

T Do you think C8 is right, C5? Is this a good way to solve the problem?

C5 (nods head) I can cut it.

T Would you like to cut the bread and give part of it to C7? There are many times when we need to share things because there is not enough for everyone. What are some of the other things in school that we must share?

Cl We share the paints and the clay.

T Yes, C1, during free-choice time we share the things we have to play with or sometimes we just take turns using them.

C7 And we gotta share toys.

T You share toys like blocks and dolls and trucks. When is another time you need share...at home?

C3 I have to share my food.

T Who do you share food with? Your brothers and sisters?

C3 Yes and sometimes with my mom.

T Some people do not have a lot of food. They need to share it. Food is important to share.

C. Cleaning-up and Transition:

C5 I want to go outside!

T C5, when do you think we will be going outside?

C5 After nap-time.

T Can anyone tell me why we have a nap right after lunch? (pause) Why do you think we rest after lunch?

C9 We get sleepy.

T O.K., some of you sleepy or tired. What do you think would happen if we went outside and played right after you ate a lot of food?

C8 You feel like throwing up!

C2 I don't. I like to play outside after dinner.

T Yes, some kids can run around with a full stomach and others can't. We think it's a good idea to take a nap after lunch so everyone will feel 0.K. Can you kids help me make a plan for this afternoon? (Cs nod; say "yes") What do we need to do next?

C5 We have a nap!

T C5, What do we need to do before we take a nap?

C5 Get our mats out.

T Good! We need to get the mats out for nap-time. What do we need to do before that?

C3 We have to clean up the lunch tables.

T Right! We need to clean this area, don't we? 0.K., after we clean-up, and get the mats out and take our nap, what will we do then?

C7 Then we go outside!

T That's right, then we will go outside.

C8 And when we come back into school we will do a story. And then go home.

T Did C8 forget one thing? What do we do every day before we go home?

C2 Summary Time.

T Yes, we have summary time. Good! How did you know that we would do all those things today? Did someone tell you?

C5 No! We did it yesterday!

T Do you think we will do those things again tomorrow?

Cs Yes.

T If we change part of our schedule or do something special, will we still be in school? Will we still be our class?

Cs Yes!

T Yes! I think you are all thinking very carefully today! It looks like it's about time to do what?

C6 To clean up!

- -

The following interaction between a parent (P) and a child (C) occurs in the living room.

C (kick...kick...kick...)

P Why are you kicking the table?

C I like to kick.

P Let me try. (kick...kick...) hmm... You know, I like to kick too. It's fun to kick. Do you think it's *bad* to kick?

C Ahh...

P It's not bad to kick. You just need to know the right time and the right place to kick. Is this the right time and the right place to kick?

C No...

P Why don't you think so?

C I might knock something off the table and break it.

P You're thinking...good for you! If you kick in the house, you might break the vase of the lamp, or

C I might scratch the table with my hard shoes.

P You're right. A big scratch in the table wouldn't look very good, would it? We need to take care of things so they can last a long time. How would you feel if Robert went into your room and kicked your teddy bear or your piggy bank?

C Grandmother gave me the piggy bank. I don't want Robert to break it. I would feel mad. I would be sad if he broke it. I would have to throw the sharp pieces away. I want to keep my piggy bank.

P You're right. It does make us feel sad and mad when someone breaks something that is special to us. That's why the house is not a good place to kick.

You might get carried away and break something--something that is special to somebody. I have some things that are special to me, just like your toys are special to you. It's OK to kick--but not in the house. That's a rule.

C We have rules at school. We don't kick people. We kick the ball--outside. We don't kick the toys.

P That's right. Just like you follow rules at school, you need to follow rules at home. Kicking chairs and children are not following rules and that's not the right thing to do. That's not being a responsible person. Can you think of some things that we can kick?

C We can kick an empty box or...we can kick a balloon!

P Good thinking! Where do you think a good place might be to kick the box and the balloon?

C Outside--in the yard.

P You're right. Outside is a good place to kick. You're a smart boy. You're using your thinking cap.

C My teacher said if we hurt somebody or take something away from them, they would feel sad.

P That's right. Remember when Tommy took your red truck home with him and you didn't know where it was? And when you wanted to show it to Grandma--you couldn't find it. We looked and looked...

C I cried. I couldn't find my truck.

P That's right. You were sad.

C Tommy and his mama came over and brought the truck back. Tommy said he was sorry he took my truck home. He didn't ask me.

P It is important to think about other people's feelings. You don't just take things that belong to other people. You shouldn't kick other people's things. If someone starts to kick your things you should say, "Stop. Please don't kick my things. They are special to me and I want to keep them. I don't want them torn up." When you see something you want that doesn't belong to you, you just don't take it. You ask, "May I play with the toy please?"

C Can we go outside and play kickball?

P Okay, but first let's eat some lunch. If we eat now it will make us stronger and we can kick the ball a long way.

C All right!!!