



TEACHING DIAGRAMS

Mediated Learning Experience

&

Instrumental Enrichment

1. S-H-O-H-R
2. Mediated Learning Experience
3. MLE Criteria and Interactions
4. Distal and Proximal Determinants
5. Cognitive Functions
6. Cognitive Map
7. Goal and Sub-goals of IE
8. Characteristics of IE
9. DAPAR-IE Follow-up Study
10. IE Follow-Up study
11. LPAD Model
12. Instrumental Enrichment Lesson Plan

1. Definition: MLE is defined as a quality of human-environment interaction.
2. As such it represents one of the following two modalities of human-environment interaction:
 - a. Direct exposure to stimuli, considered as the most pervasive way in which the organism-environment interaction affects the organism.
 - b. MLE, through which the interaction Human-Environment (H-E) is mediated by a human whose intentionality transforms the three components of H-O-S meaningfully into a compatible combination.
3. MLE as the second modality of interaction determines the effectiveness of the first modality, namely, direct exposure, in modifying the cognitive structure of the human organism.
4. In the MLE modality, the formula of S-R or of S-O-R becomes S-H-O-H-R (see p.2).
5. In order to emphasize the importance of the two modalities rather than of each one of them in isolation, H is represented as affecting only a relatively limited part of the organism's exposure to the world.
6. MLE produces in the individual modalities of interaction which can be applied to a great diversity of content or of repertoires of behavior irrespective of the specificity of the language of mediation or of its particular contents.
7. In line with the above, MLE has a universal meaning irrespective of language or content in which mediational interaction takes place.
8. MLE represents the unique feature of human interaction and as such it is conceived of as the determinant of the autoplaticity of the human organism. MLE plays a major role in determining the evolutionary trends and the considerable changes that take place in the human mental functioning.
9. One can suggest that MLE reflects a deeply ingrained need of the human to transmit him/herself transgenerationally as a way to insure his/her continuity beyond biological existence.
10. Lack of MLE voids the deprived organism of its autoplaticity which may result in a lack of or reduced modifiability, i.e. in individuals for whom the direct exposure to stimuli has a limited effect even when this exposure is of an active operational nature.
11. MLE is thus considered as the main determinant of differential cognitive development as triggered by a series of distal determinants (see p.7).

12. Since MLE is considered as the natural, normal modality of human interaction, it is the lack of it that has to be explained. Failure of MLE to appear can be due to three categories of determinants:
- a. Failure on the part of the mediators, i.e. parents, caretakers, educators and society, to offer MLE to the next generation.
 - b. Among the environmental and societal determinants of lack of MLE one can note the following list (not exhaustive):
 - i. Poverty
 - ii. Cultural discontinuity (migration)
 - iii. Cultural discontinuity for ideological reasons
 - iv. Disruption of social structure affecting the mediational capacity of society, i.e. disruption of extended families, destruction of the nuclear family, single parent families, etc.
 - v. Socio-economic conditions.
 - c. The failure of the receiving organisms to become affected by the MLE offered to them due to certain endogenous conditions which characterize him/her.
 - i. Emotional affective conditions (i.e. autism).
 - ii. Organic conditions, hyperactivity or hypoactivity, sensorial deficits.
 - iii. Maturational problems, giftedness.All these conditions may render the organism impenetrable to the effects of normally emitted forms of MLE.
13. The effects of MLE result in reduced modifiability and are considered as highly reversible irrespective of the organic or mental substrata of its effect.
14. The nature of MLE is best described by a series of parameters which reflect the structure of the interaction rather than its content or the language in which it is presented. These ten parameters are conceived of as presenting both the energetic, dynamic principles affecting both the nature of the interaction, its intensity as well as the decisions determined by its intentions and its meaning.

A brief blueprint of the encoding of MLE interactions according to their mediative meaning. It represents, for didactical purposes, a shortened version of suggested categories. As such, it is not to be considered as either exhaustive or definitive.

I. Criteria for MLE

- IR Intentionality and Reciprocity
- T Transcendence
- MM Mediation of Meaning
- MFC Mediation of Feeling of Competence
- MRCB Mediated Regulation and Control of Behavior
- MSB Mediated Sharing Behavior
- MIPD Mediated Individuation & Psychological Differentiation
- MGSSA Mediation of Goal Seeking, Goal Setting & Goal Planning & Achieving Behavior
- MCNC Mediation of Challenge: the Search for Novelty & Complexity
- MAHCE Mediation of Awareness of the Human as a Changing Entity
- MSOA Mediation of the Search for an Optimistic Alternative
- MFB Mediation of the Feeling of Belonging

II. Participants & Initiators in Mediated Interaction

- | | | | |
|--------|-----------------|--------|-----------------|
| 1. MC | Mother Child | 2. CM | Child Mother |
| 3. FC | Father Child | 4. CF | Child Father |
| 5. SC | Sibling Child | 6. CS | Child Sibling |
| 7. CTC | Caretaker Child | 8. CCT | Child Caretaker |
| 9. OC | Other Child | 10. CO | Child Other |

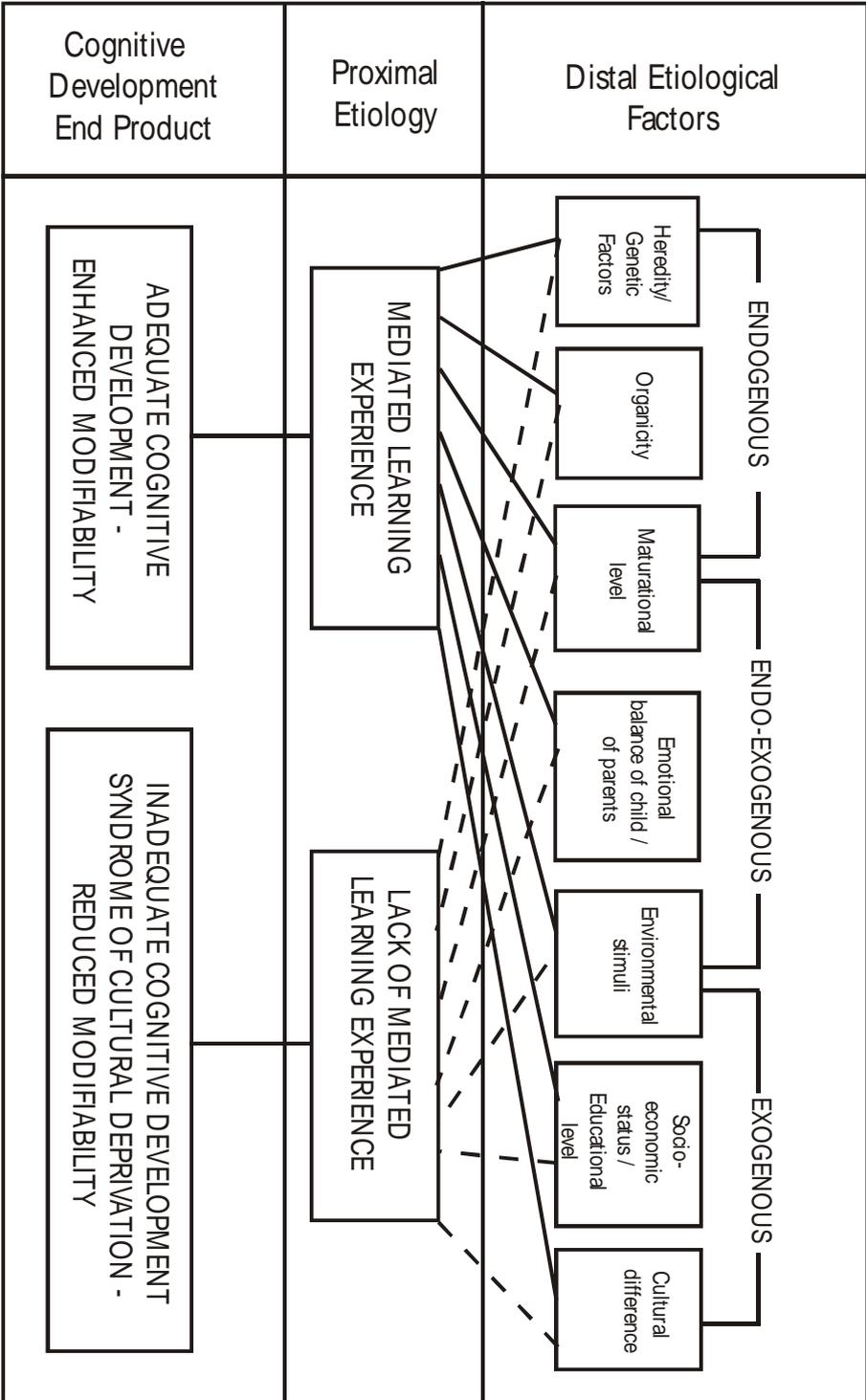
III. Categorization of Mediated Interactions

1. MF Mediated Focusing
2. MSS Mediated Selection of Stimuli
3. MS Mediated Scheduling
4. PM Provoking (requesting) Mediation
5. MPA Mediation of Positive Anticipation
6. MAS Mediated Action Substitute
7. MIM Mediated Imitation
8. MRE Mediated Repetition
9. MRR Mediated Reinforcement and Reward
10. MVS Mediated Verbal Stimulation
11. MIC Mediated Inhibition and Control
12. MPS Mediated Provision of Stimuli
13. MRS Mediated Recall Short-term
14. MRL Mediated Recall Long-term
15. MTP Mediated Transmission of Past
16. MRF Mediated Representation of Future
17. MIDV Mediated Identification and Description Verbal
18. MIDN Mediated Identification and Description Non-Verbal
19. PVRM Positive Verbal Response to Mediation
20. PNVM Positive Non-verbal Response to Mediation
21. MAR Mediated Assuming Responsibility

22.	MSR	Mediated Shared Responsibility
23.	MCER	Mediation of Cause and Effect Relationship
24.	MRV	Mediated Response Verbal
25.	MRM	Mediated Response Motor
26.	MDS	Mediated Discrimination and Sequencing
27.	MSO	Mediation of Spatial Orientation
28.	MTO	Mediation of Temporal Orientation
29.	MCB	Mediation of Comparative Behavior
30.	MSC	Mediation Fostering a Sense of Completion
31.	MDA	Mediation Directing Attention
32.	MAA	Mediated Association and Application
33.	MCI	Mediated Critical Interpretation
34.	MDR	Mediated Deductive Reasoning
35.	MIR	Mediated Inductive Reasoning
36.	MDIT	Mediation Developing Inferential Thinking
37.	MPSS	Mediation of Problem-solving Strategies
38.	MTV	Mediated Transcription of Values
39.	MNPIL	Mediation of Need for Precision of Input Levels
40.	MNPOL	Mediation of Need for Precision of Output Levels
41.	MNLEI	Mediation of Need for Logical Evidence on Input Levels
42.	MNLEO	Mediation of Need for Logical Evidence on Output Levels
43.	MSE	Mediation of Systematic Exploration
44.	MCR	Mediated Confrontation of Reality
45.	MOS	Mediated Organization of Stimuli
46.	MCOV	Mediation of Cognitive Operation Verbal
47.	MCOM	Mediation of Cognitive Operation Motor
48.	MPFV	Mediation of Perception of Feelings Verbal
49.	MPFN	Mediation of Perception of Feelings Non-verbal
50.	MR	Mediation of Reciprocity

IV. Additional Types of Interaction with Stimuli & Others

1.	DEXIS	Directed Exposure and Interaction with Stimuli
2.	PM	Interaction with Previously Mediated Stimuli
3.	TE	Trial and Error
4.	SOL	Soliloquy
5.	NMI	Non-Mediated Interaction
6.	NMAS	Non-Mediated Interaction Leading to Substitute
7.	NMVC	Non-Mediated Verbal Control
8.	NMMC	Non-Mediation Motor Control



Distal & Proximal Determinants of Differential Cognitive Development

Impaired cognitive functions affecting the **Input Level** include those impairments concerning the quantity and quality of data gathered by the individual as he is confronted by a given problem, object, or experience. They include:

1. Blurred and sweeping perception
2. Unplanned, impulsive, and unsystematic exploratory behavior
3. Lack of, or impaired, receptive verbal tools which affect discrimination (e.g. objects, events, relationships, etc. do not have appropriate labels).
4. Lack of, or impaired, spatial orientation; the lack of stable systems of reference impairs the establishment of topological and Euclidean organization of space.
5. Lack of, or impaired, temporal concepts.
6. Lack of, or impaired, conservation of constancies (size, shape, quantity, orientation) across variation in these factors.
7. Lack of, or deficient, need for precision and accuracy in data gathering.
8. Lack of capacity for considering two or more sources of information at once; this is reflected in dealing with data in a piecemeal fashion, rather than as a unit of organized facts.

The severity of impairment at the Input Level may also affect ability to function at levels of Elaboration and Output, but not necessarily so.

Impaired cognitive functions affecting the **Elaboration Level** include those factors which impede the efficient use of available data and existing cues.

1. Inadequacy in the perception of the existence and definition of an actual problem.
2. Inability to select relevant vs. non-relevant cues in defining a problem.
3. Lack of spontaneous comparative behavior or limitation of its application by a restricted need system.
4. Narrowness of the psychic field.
5. Episodic grasp of reality.
6. Lack of, or impaired, need for pursuing logical evidence.
7. Lack of, or impaired, internalization.
8. Lack of, or impaired, inferential-hypothetical thinking.
9. Lack of, or impaired, strategies for hypothesis testing.
10. Lack of, or impaired summative behavior
11. Lack of, or impaired, planning behavior
12. Non-elaboration of certain cognitive categories because the verbal concepts are not a part of the individual's verbal inventory on a receptive level, or they are not mobilized at the expressive level.

“Thinking” usually refers to the elaboration of cues. There may well be highly original, creative, and correct elaboration, which yields wrong responses because it is based on inappropriate or inadequate data on the Input Level.

Impaired cognitive functions on the **Output Level** include those factors that lead to an inadequate communication of final solutions. It should be noted that even adequately perceived data and appropriate elaboration can be expressed as an incorrect or haphazard solution if difficulties exist at this level.

1. Egocentric communicational modalities.
2. Difficulties in projecting virtual relationships.
3. Blocking.
4. Trial and error responses.
5. Lack of, or impaired, tools for communicating adequately elaborated responses.
6. Lack of, or impaired, need for precision and accuracy in communicating one's responses.
7. Deficiency of visual transport.
8. Impulsive, acting-out behavior.

The three disparate levels were conceived so as to bring some order into the array of impaired cognitive functions seen in the culturally deprived. Yet, there is interaction occurring between and among the levels, which is of vital significance in understanding the extent and pervasiveness of cognitive impairment.

Input

1. Clear and detailed perception;
2. Systematic exploratory behavior;
3. Well-developed verbal tools used for labeling objects, events, relationships, etc.
4. Well-established system of spatial orientation;
5. Well-developed temporal concepts and orientation in time;
6. Conservation of constancies (size, shape, quantity, direction) across various object domains;
7. Well-developed need for precision and accuracy in data gathering;
8. Ability to consider two or more sources of information at once.

Elaboration

1. Ability to identify and define the problem.
2. Ability to distinguish between relevant and non-relevant cues in defining a problem.
3. Well-developed spontaneous comparative behavior.
4. Broad mental field.
5. Ability to integrate different aspects of reality.
6. Need for and ability to pursue logical evidence.
7. Well-developed internalization processes.
8. Ability to use inferential-hypothetical thinking.
9. Availability of strategies for hypothesis testing.
10. Well-developed summative behavior
11. Well-developed planning behavior
12. Availability of verbal concepts that support reasoning processes.

Output

1. Ability to communicate well-elaborated responses.
2. Need for precision and accuracy in communicating one's responses.
3. Ability to project virtual relationships.
4. Well-developed self-regulation and ability to avoid trial-and-error responses.
5. Well-developed functions of visual transport.
6. Ability to restrain impulsive or acting-out behavior.

Another important way to conceptualize the relationship between the characteristics of a task and its performance by a subject is the *Cognitive Map*. The conceptual model is not a map in the topographical sense but a tool by which to locate specific problem areas and to produce changes in corresponding dimensions. The Cognitive Map describes the mental act in terms of seven parameters that permit us to analyze and interpret a subject's performance. The manipulation of these parameters becomes highly important in the examiner-subject interaction in the formation and validation of hypotheses regarding the loci of the subject's difficulties. The seven parameters are as follows:

1. The universe of content around which the mental act is centered

The competence with which subjects deal with a specific content is directly related to each subject's experiential, cultural, and educational background. Certain content may be quite unfamiliar to a subject, and thus may require such an intensive investment for its mastery that it is no longer useful for providing information about the cognitive functions and operations it involves, the real target of the assessment. Manipulation of the content in both assessment and intervention will become a source of insight for change.

2. The modality or language in which the mental act is expressed

The modality, which may be verbal, pictorial, numerical, figural, symbolic, graphic, or any combination of these and other codes, will affect subjects' performance. The parameter of modality is important due to the fact that the elaborative capacities revealed by subjects on any single modality may not reflect reliably their capacity if the task were presented in another modality. For example, a subject may be able to complete a mathematical operation successfully when the problem is presented in numbers and signs and fail when the same problem is presented in a verbal modality.

3. The phase of the mental act

The mental act can be broadly divided into three phases: *input*, *elaboration* and *output*. Although there is an interrelationship among the three phases, a greater or lesser emphasis may be placed on one or another of them by the requirements of a particular mental act. The isolation of the phase (and of the strengths and/or deficiencies of the cognitive functions it contains) helps to locate the sources of inadequate responses and to determine the nature and extent of mediation the examiner must provide.

4. The cognitive operations required by the mental act

A mental act is analyzed according to the rules or operations by which information is organized, transformed, manipulated, understood and acted upon to generate new information. Operations may be relatively simple (e.g., identification or comparison) or complex (e.g., analogical thinking, transitive thinking, or logical multiplication).

5. Level of complexity

A mental act is analyzed according to the number of units of information upon which it centers, in conjunction with the degree of novelty or familiarity of the information to the subject.

6. Level of abstraction

The conceptual or cognitive distance between a given mental act and the object or event upon which it operates defines the level of abstraction. For example, the mental act involved in sorting by producing relationships among objects through perception and motor performance (i.e., concrete – abstract) represents a lower level of abstraction than does a mental act involving an analysis of the relationships among relationships (i.e., abstract – abstract).

7. The level of efficiency with which a mental act is performed

The level of efficiency of a mental act can be measured objectively by the rapidity and precision with which it is performed, and by the subjective criterion of the experienced amount of effort invested in the performance of the task. The level of efficiency is a function of the degree of crystallization of the mental act and the recency of its acquisition. Processes that are recently acquired and not yet automatized are more vulnerable and less resistant to a variety of interfering factors. Lack of efficiency may be due to difficulties in one or more of any of the other six parameters, as well as to a host of physical, environmental, affective and motivational factors which may be transient and fleeting or more pervasive. This parameter is not to be confounded with the question of the subject's capacity, although in conventional psychometric procedures there is very frequently confusion between the two.

Goal:

Enhancement of organism's modifiability

Sub-goals:

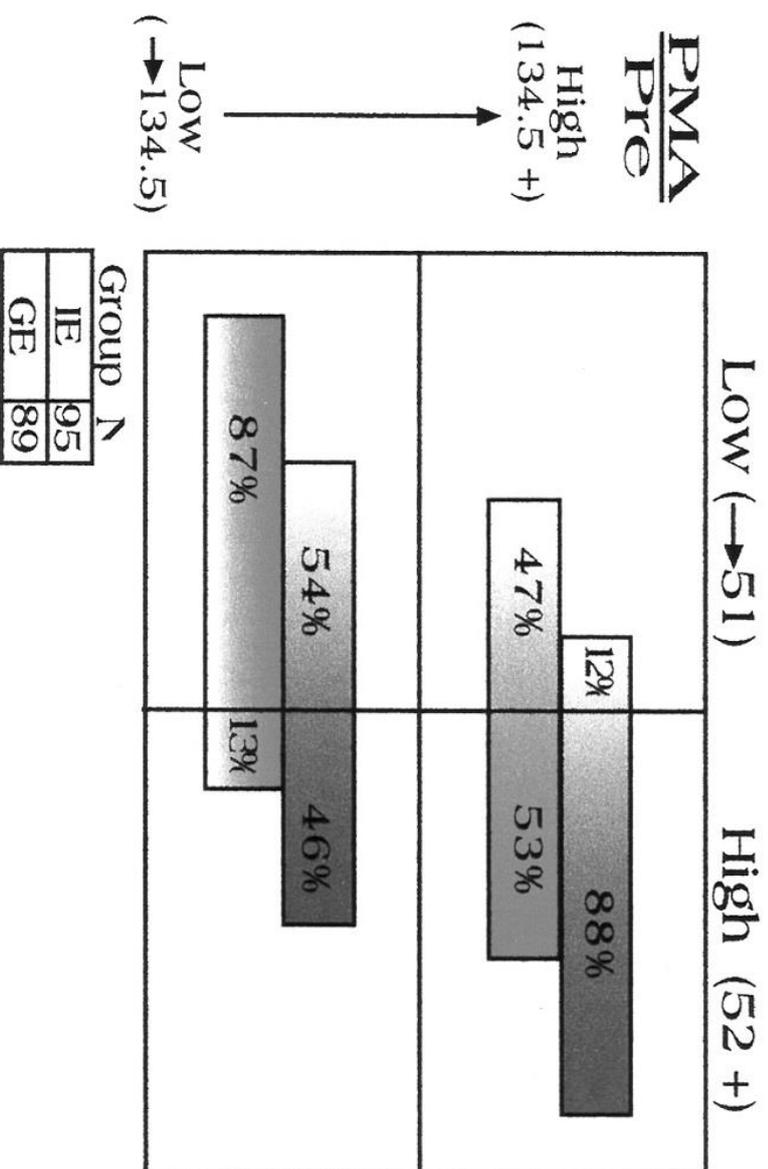
1. Correction of the deficient cognitive functions
2. Acquisition of basic concepts, labels, and operations
3. Production of intrinsic motivation through habit formation
4. Creation of task-intrinsic motivation
5. The production of reflective, insightful, and introspective thinking processes
6. The development of the active learning attitude

- 1.1. Instrumental Enrichment is based on a systematic utilization of functions that are the prerequisites of proper cognitive operations. Each instrument focuses on a specific cognitive function, but simultaneously addresses itself to the correction of many others that may be deficient.
 - 1.2. Instrumental Enrichment involves the cognitive operations considered as the components of adequate cognitive functioning. These are of varying levels of complexity and novelty.
 - 1.3. Instrumental Enrichment assigns tasks to the learner that require him/her to use higher mental processes. Even though there are exercises in the instrument that involve more elementary cognitive processes, they are prerequisites for, rather than the essential goal of the activity.
 - 1.4. Instrumental Enrichment places stress on the development of intrinsic motivation through formation of habits by manifold and varied repetition of the different target functions. However, the emphasis of the repetition is not on the tasks themselves, but on the function that is invariant within the divergent activities elicited by the task. This facilitates flexibility, shift, and transfer.
 - 1.5. Instrumental Enrichment attempts to elicit two distinct types of motivation. The first is task-intrinsic. Tasks are shaped in a way that makes them a target for curiosity and arouses a need for active mastery, a need which increases with the progressive complexity of a task. Success at earlier levels creates a potent need to cope with and master the more difficult tasks. The second type of motivation is the reinforcement of the social meaning of a task. There is a need to achieve not only in relation to the peer group but in relation to the teacher as well. The teacher in Instrumental Enrichment shares more of a partnership relationship with the student than in most other instructional interactions. Both types of motivation are fostered by the challenge presented by the tasks, which are genuinely difficult, even for an experienced and achieving adult.
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- 2.1. Instrumental Enrichment is designed as a content-free set of tasks, in the sense that the content of an instrument does not serve as its goal, *per se*, but is, instead, a carrier for the more direct goals of the instrument. Content is chosen not by virtue of its specificity, but because its special characteristics permit the acquisition of the prerequisites of thinking.
 - 2.2. Despite its deliberate content-free design, Instrumental Enrichment provides for easy bridging to specific subject-matter areas because its dimensions are those necessary for content learning. Such bridging is enhanced by the activity of the teacher whose goal is to produce insight in the student.
 - 2.3. Instrumental Enrichment is designed to stress the nature, structure, and complexity of the tasks themselves and the effects produced through the child's confrontation with them. Its structure ensures the attainment of the majority of the program's sub goals. The efficiency of FIE is highly enhanced, however, by the mediation of well-trained teachers.

- 2.4. Instrumental Enrichment implies a level of consciousness and awareness of the partners involved in the training process: teacher-student-material. This awareness involves both the global goal of Instrumental Enrichment and the specific meanings of each task for the development of efficient use of cognitive processes and adaptation to new situations, in general.
 - 2.5. For performing its tasks, Instrumental Enrichment includes and requires a variety of transformational, elaboration processes, with the performer actively contributing to the organization and restructuring, and the discovery and reapplication of the produced relationships. Mastery of the tasks in Instrumental Enrichment is never a matter of rote learning or the mere reproduction of a learned skill. Accomplishment of the tasks always involves the learning of rules, principles, or strategies underlying the task, rather than the task itself.
 - 2.6. Instrumental Enrichment materials are constructed to produce the conditions of a responsive environment. As such, the materials elicit in the student a need for mastery of the task with the criteria for mastery established by the materials themselves; and thus, feedback is built into the tasks and the student is constantly informed of his performance.
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- 3.1. Instrumental Enrichment is accessible to, and useful for, a wide range of populations in terms of levels, ages, and skills. Its content-free nature, and the progressive difficulty and challenge of its tasks, make it appropriate for all cases in which improvement in cognitive functioning is sought. Of particular importance is that it avoids stigmatizing, or reinforcing a low self-image in, individuals who engage in the program by avoiding the frequent practice of simplifying “normal” curricula to accommodate lower levels of functioning.
 - 3.2. The principles and didactics of Instrumental Enrichment are useful in changing the attitudes and techniques of educators, psychologists, social workers, and counselors toward the target populations. The methodology of Instrumental Enrichment is transferable to other subject matter and treatment areas.

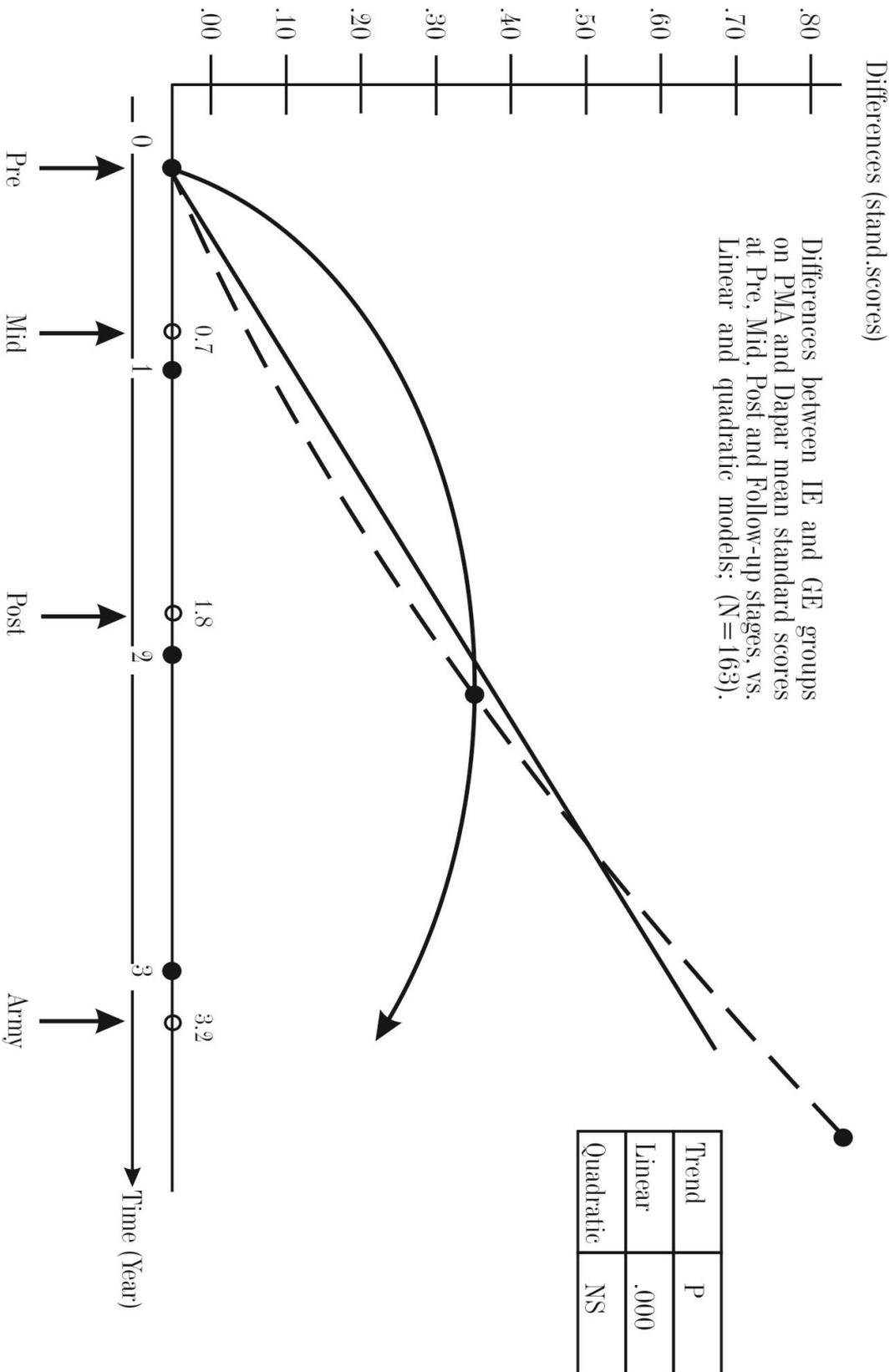
DAPAR – IE Follow-up Study

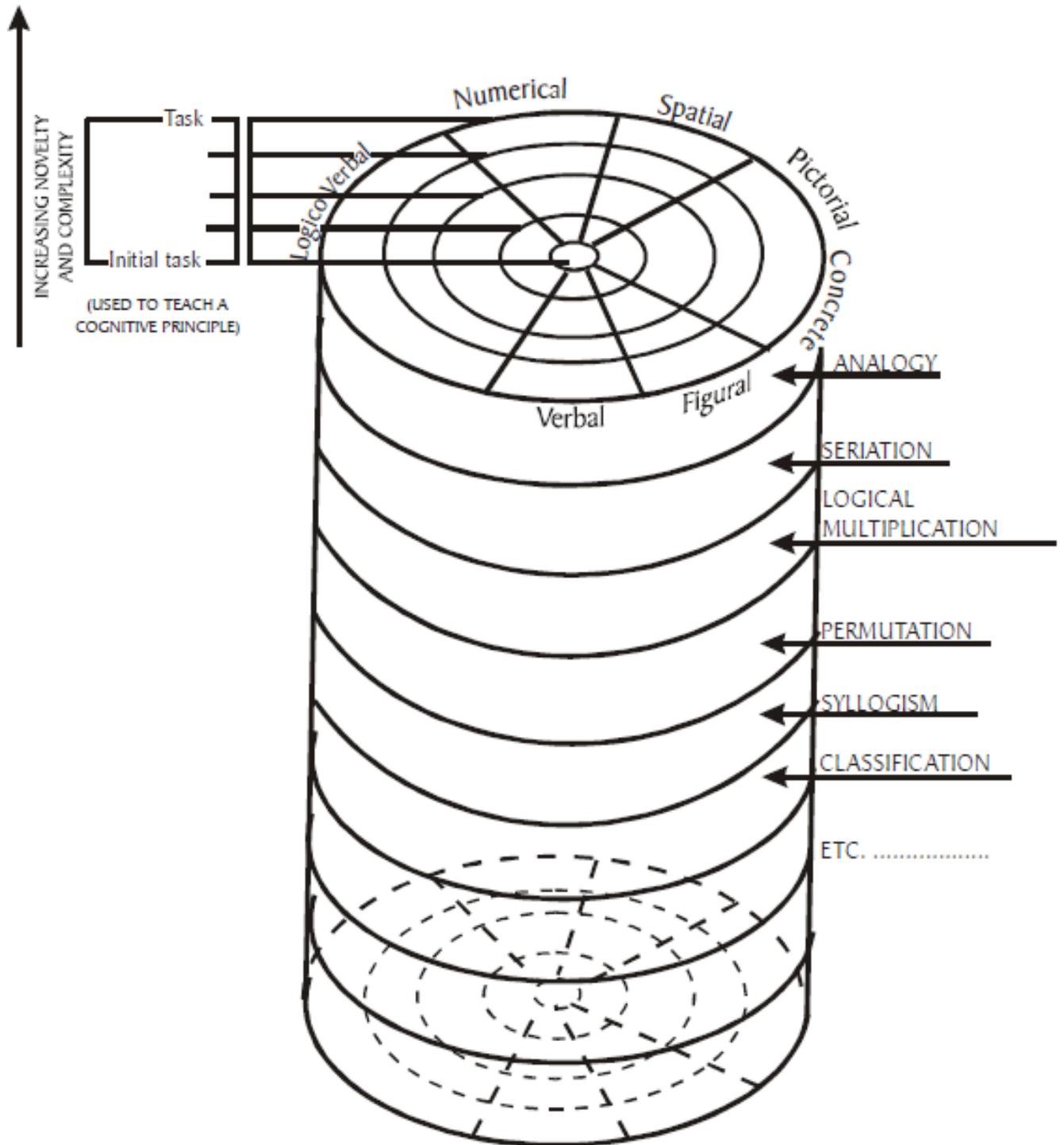
Percentages in Categories of PMA – Pre and Dapar – Post(High vs. Low); (N – 184).



Group	N
IE	95
GE	89

IE Follow-Up Study





Teacher: _____ Instrument: _____ Page: _____

1. General objective of lesson

2. Cognitive functions to be developed during the lesson

Input phase

Elaboration phase

Output phase

3. Enriching the repertoire of concepts, labels and definitions

4. Cognitive activities and operations to be developed during the lesson

Tentative list of cognitive activities

1. Representation
2. Comparison
3. Symbolization, Encoding, Decoding
4. Categorization
5. Organization, Ordering
6. Summarizing
7. Inductive reasoning
8. Deductive reasoning
9. Hypothetical thinking

5. Cognitive strategies to be developed during the lesson

Partial list of cognitive strategies

1. Systematic search
2. Decomposing complex problems
3. Narrowing the field, elimination
4. Locating keywords
5. Searching for cues

6. Developing abstract thinking

List of activities for developing abstract thinking

1. Extracting a principle from given instances (inductive reasoning)
2. Applying a principle to given instance
3. Forming superordinate concepts
4. Setting up a general model of the problem (using symbols)
5. Searching for analogical problems in other areas.

7. "Bridging" activities
