DOCUMENT RESUME

ED 321 078 CE 055 193

AUTHOR Lee, Howard D.
TITLE Elements of Instruction VTAE Workshop (Wisconsin Rapids, Wisconsin, March 7-9, 1989). Final Report.
INSTITUTION Wisconsin Univ. - Stout, Menomonie. Center for Vocational, Technical and Adult Education.
SPONS AGENCY Wisconsin State Board of Vocational, Technical, and Adult Education, Madison.
PUB DATE Jun 89
GRANT 30-108-150-239
NOTE 341p.; For related documents, see CE 055 192-194 and CE 055 196-199.
AVAILABLE FROM Center for Vocational, Technical and Adult Education, 218 Applied Arts Bldg., University of Wisconsin-Stout, Menomonie, WI 54751.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC14 Plus Postage.
DESCRIPTORS Classroom Observation Techniques; Educational Environment; *Inservice Teacher Education; *Instructional Improvement; Instructional Leadership; Postsecondary Education; Secondary Education; *Teacher Improvement; Teacher Responsibility; *Teaching Methods; Vocational Education; Vocational Education Teachers
IDENTIFIERS *Hunter (Madeline); *Wisconsin

ABSTRACT

This document describes a 3-day Wisconsin workshop on essential elements of instruction in vocational, technical, and adult education (VTAE). The workshop's content was based on the Univesity of California at Los Angeles' Teaching Model, which resulted from the work of Madeline Hunter. A three-page narrative describes some aspects of the model, lists the workshop's objectives, and describes the workshop. The objectives were to develop an awareness of the Hunter approach by: (1) defining teacher responsibilities and criteria and critical questions relating to a profession; (2) identifying characteristics of teaching to an objective; (3) selecting an objective at the correct level of difficulty; (4) recalling the steps to monitor and adjust the teaching; (5) identifying and demonstrating use of the principles and characteristics of learning; (6) keeping a log of teaching actions for 2 weeks; and (7) analyzing and evaluating the teacher action with respect to the elements of instruction. The rest of the document consists of letters regarding the workshop, a participants' list, handout materials, transparency masters, a workshop completion certificate, evaluation rating scales, and participant comments. (CML)

Final Report

Workshop Conducted for Wisconsin State Board of Vocational, Technical and Adult Education

Center for Vocational, Technical and Adult Education
University of Wisconsin-Stout
Menomonie, WI 54751

Submitted by Howard D. Lee

ELEMENTS OF INSTRUCTION
VTAE WORKSHOP
June 1989

Project #30-108-150-239

The material herein was developed pursuant to Grant Number 30-108-150-239 with the State Board of Vocational, Technical and Adult Education, partially reimbursed from allocation of Federal funds from the Department of Education. Contractors undertaking such projects under government sponsorship are encourged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, represent official Department of Education position or policy. UW-Stout does not discriminate on the basis of race, sex, age, religion, handicap or national origin.

ELEMENTS OF INSTRUCTION-VTAE WORKSHOP
Final Report

Background

The Elements of Instruction VTAE workshop was conducted March 7-9, 1989 at Wisconsin Rapids. The workshop was based on the notion that effective instruction is directly related to recruitment, retention, placement and overall program effectiveness and thus vital to any school. The model used in this workshop is based on the UCLA Teaching Model, Essential Elements of Instruction, resulting from the work of Dr. Madeline Hunter. Dr. Hunter has translated psychology research along with hundreds of hours of observation and analysis into meaningful content easily understood by those in the teaching field. When coupled with an ongoing program of instructional supervision and live instructional conferences, this two-part process has been judged to be one of the most effective ways to heighten, maintain and refine instructional skills.

The process is based on the assumption that there is a body of knowledge which forms the underpinning of teaching. This body of knowledge is not limited to any one content area or learning situation, but rather, "It applies to every human interaction that is conducted for the purpose of learning." In contrast to many other models of teaching, the UCLA teaching model negates the need for a particular style of teaching . . . eliminating a "recipe" to follow for success. Instead, the model recognizes teaching as a process of decision-making, utilizing proven research to delineate what a teacher needs to consider before deciding what to do. Districts have seen that the UCLA model undergirds many other models of teaching (direct, indirect, discovery approach, cooperative learning, individualized instruction, etc.) because it identifies the decisions that all teachers make regardless of the chosen method of instruction. As such, it provides the base for other programs to build upon. The process acknowledges the fact that the most important educational element in our schools is the instructional skill of the teacher.

Many new and experienced instructors need help concentrated on improving instruction - studying research, integrating effective instructional techniques into new curriculum programs, and highlighting instructional behaviors in teaching. The "Elements of Instruction," forms the theoretical base of knowledge describing how students learn and

form this knowledge, how instructors can then make instructional decisions to increase the probability that students will learn.

Workshop Objectives:

The objectives of the workshop were:

Develop an awareness of the Madeline Hunter approach as it applies to vocational, technical, and adult education by:

1. Defining criteria and critical questions relating to a profession, and teacher responsibilities.
2. Identifying characteristics of teaching to an objective.
3. Selecting an objective at the correct level of difficulty.
4. Recalling the steps to monitor and adjust the teaching.
5. Identifying and demonstrating use of the principles and characteristics of learning.
6. Keeping a log of teaching actions for two weeks.
7. Analyzing and evaluating the teacher action with respect to the Elements of Instruction.

Workshop

The content of the workshop consisted of techniques in the Madeline Hunter method of researched topics of Elements of Instruction as applied to vocational, technical, and adult education. Topics included teach to an objective; selecting objectives at the correct level of difficulty; monitor and adjust, and principles of learning including motivation, retention, transfer, set, active participation, reinforcement and closure.

Letters were sent to each district announcing the workshop in January, 1989. At that time, background information, objectives, teams, registration and credit information was also sent out (see Attachment A).

Each VTAE District was invited to send three participants. It was suggested that a team be made up of two instructors and one first-line

supervisor. This team would also participate in a three day follow-up Instructional Supervision workshop to be offered a few weeks after the Elements of Instruction workshop.

The workshop was conducted with formal presentations, then opportunity for participants to put the content in their own words and then and practice. Practicing was accomplished through sharing, worksheets and group activities. Each participant had an opportunity to practice what they learned by presenting a lesson and to observe other instructors as they presented instruction. Feedback from participants was gathered at the end of the first two days and adjustments made to accommodate participants concerns.

Sixteen participants from eight VTAE districts participated in the workshop. Of the participants, three were supervisors, two were curriculum specialist one was a general education instructor, and the rest occupational instructors (see Attachment B).

Participants were each provided with a three ring notebook (see Attachment C) with labeled dividers. Also provided were numerous articles, information sheets, worksheets and notebook paper. Numerous transparencies were developed and also mailed to each district for use (see Attachment D). Each participant also received a Certificate of Completion (see Attachment E). Thirteen of the participants signed up for one course credit (three undergraduate and 10 graduate) through UW-Stout. Based on University of Wisconsin System Policy #22, the tuition fee was waived except for the segregated fee which participants paid.

Each participant completed an evaluation form. The tabulated average rating was 4.7 out of a possible 5 (see Attachment F). Participant comments are attached and indicate excellent results (see Attachment G). Many expressed the lack of some district support by not sending any one or only sending one person to the workshop. Many asked if the workshop would be offered again.

ATTACHMENT A

Letters

CVTAE
CENTER FOR VOCATIONAL TECHNICAL AND ADULT EDUCATION
715-232-1382

UNIVERSITY OF WISCONSIN
STOUT
MENOMONIE WISCONSIN 54751

January 31, 1989

Thomas Maney
Dean of Instruction
Nicolet Technical College
P.O. Box 518
Rhinelander, WI 54501

Dear Tom;

The State Board of Vocational, Technical and Adult Education and the Center for Vocational, Technical and Adult Education, University of Wisconsin-Stout are conducting two staff development workshops:

- ELEMENTS OF INSTRUCTION
  March 7-9, 1989
  Mead Inn-Wisconsin Rapids, WI
- INSTRUCTIONAL SUPERVISION
  March 28-30, 1989
  Mead Inn-Wisconsin Rapids, WI

The purpose of the first workshop, ELEMENTS OF INSTRUCTION is to heighten the skills of the instructor by providing instruction in the essential researched elements of instruction. The workshop is planned for each district to send a team of three people: two teachers (ACE - or part time instructor may also be sent) and one first line supervisor, or department head. It is important that the first line supervisor be someone who has responsibility to evaluate/supervise instructors.

The second workshop, INSTRUCTIONAL SUPERVISION, will apply skills learned in the first workshop by providing a focus on improvement of instruction by the development of observation, analysis and conferencing skills. Participants will be able to reinforce the effective instruction of skills observed, and refine or add new skills.

Districts should plan to send the same first line supervisor to each workshop. One or both of the teaching staff who attended the first workshop should also plan to attend the second with the supervisor. A team will facilitat the comprehension, application and implementation of the new concepts and strategies learned.

The presenters for the workshop will be Howard Lee, Co-Director, of the Center for Vocational, Technical and Adult Education, University of Wisconsin-Stout and Bill Mamel, Consultant, Instructional Troubleshooters, Minneapolis, MN.

Credit Offered

One credit (either graduate or undergraduate) will be offered with tuition waived. A small UW-System institutional fee (graduate $9.82, undergraduate $12.54) will be the only charge. Registration for credit will occur at the workshop.

A confirmation letter will be sent to registered participants prior to the workshop.

The workshop grant will cover lunches and breaks. Other meals, travel and lodging expenses are the responsibility of each VTAE district. There will be no general registration charge for this workshop.

Continued on next page...

Please complete the enclosed registration form and return it in the envelope provided by **Wednesday, February 15, 1989.** Call the Mead Inn (715/423-1500) directly for lodging arrangements, noting you are attending this workshop. A block of rooms have been reserved. We look forward to your involvement in this staff development activity. If you have questions, please contact Sue Foxwell at (715) 232-1885.

Sincerely,

Howard Lee, Co-Director
CVTAE, UW-Stout
218 Applied Arts Bldg.
Menomonie, WI 54751

Sue Foxwell, Workshop Coordinator

asm

Enclosures
1. Registration Form
2. Agendas

cc: Lou Chinnaswamy
Bob Johnson
Jim Urness

The WISCONSIN STATE BOARD of VTAE & UW-STOUT do not discriminate on the basis of race, sex, age, religion, sexual orientation, handicap, national origin or ancestry.

CVTAE
CENTER FOR VOCATIONAL TECHNICAL AND ADULT EDUCATION
715-232-1382

UNIVERSITY OF WISCONSIN
STOUT
MENOMONIE, WISCONSIN 54751

January 31, 1989

Lou Chinnaswamy, Consultant
WI Board of VTAE
310 Price Place
P.O. Box 7874
Madison, WI 53707

RE: ELEMENTS OF INSTRUCTION WORKSHOP
March 7-9, 1989
Mead Inn-Wisconsin Rapids, WI

INSTRUCTIONAL SUPERVISION WORKSHOP
March 28-30, 1989
Mead Inn-Wisconsin Rapids, WI

Dear Lou:

Attached is a suggested letter describing the workshop to be sent out under the state director's signature. Please note that because of the timeline, we have sent workshop information and registration material to instructional services directors, noting that this letter from the state director would be forthcoming. A copy of that correspondence is enclosed for your information.

We look forward to working with you on this professional development initiative. Please feel free to contact either myself, (715) 232-2343, or Sue Foxwell, Workshop Program Coordinator, (715) 232-1885, if you have any questions.

Sincerely,

Howard

Howard Lee, Co-Director
Center for Vocational, Technical
and Adult Education

HL:asm

Enclosure

pc: Bob Johnson
Jim Urness
Sue Foxwell

Date: January 31, 1989

Subject:
- Elements of Instruction Workshop, March 7-9, 1989
- Instructional Supervision Workshop, March 28-30, 1989

Contact: Lou Chinnaswamy, Consultant

Distribution: District Directors
Assistant Director of Instructional Services
Meeting Distribution List

The Wisconsin Board of Vocational, Technical and Adult Education (WBVTAE) is sponsoring a Professional Development Workshop for instructors according to the following design:

Subject: Elements of Instruction Workshop
Date: March 7-9, 1989
Site: Mead Inn- Wisconsin Rapids, WI

Subject: Instructional Supervision Workshop
Date: March 28-30, 1989
Site: Mead Inn-Wisconsin Rapids, WI

Background: The WBVTAE encourages the development of initiatives and educational opportunities for professional advancement of educators of the VTAE system through the RFP process. The professional develpment committee with the assistance of UW-Stout has designed two workshops: Elements of Instruction and Instructional Supervision for a selected team of educators from each VTAE district.

Objectives of the Workshops:

Elements of Instruction: This three day workshop on Elements of Instruction will heighten the presentation skills of the instructor through analysis of the instructional process.

Instructional Supervision: This workshop will apply skills learned in the Elements of Instruction workshop. The focus will be on improvement of instruction through the develop-ment of observation, analysis and conferencing skills among the supervisor and the teacher.

Participants: Each district is requested to select a team of three educators. The recommended composition of the teams is: one first line superisor, or department head, and two teachers (ACE - or part time instructor may also be sent). The supervisor should have responsibility of evaluating/supervising instructors. Districts should plan to send the same first line supervisor to both workshops. One or both of the teachers attending the first workshop should also attend the second.

Registration and credits: Decisions pertaining to the cost of travel and lodging are to be made by the participants and the parent district. Lunches and breaks will be covered by the project. Housing is available at the Mead Inn (715/423-1500). One graduate or undergraduate credit will be available for workshop participants with tuition waived.

Credit enrollees are responsible for paying a UW-System institutional fee of $9.82 (graduate) and $12.54 (undergraduate).

Inquiries: Any inquiries should be directed to:

Sue Foxwell, Conference Program Coordinator
Center for Vocational, Technical and Adult Education
UW-Stout
218 Applied Arts Building
Menomonie, WI 54751
(715) 232-1885

Back-up information request will be provided by Orville Nelson, (715) 232-1362, Howard Lee, (715) 232-2343, or Lou Chinnaswamy, (608) 266-2222.

Under separate cover, letters have been sent to instructional services directors which include workshop and registration information. Districts have been requested to submit registrations by **Wednesday, February 15, 1989**, so workshop preparations can be made.

Your cooperation for this important professional development initiative is earnestly requested.

_____

State Director

asm

Enclosure

ATTACHMENT B

Participant List

VTAE Elements of Instruction Workshop
Participant List
March 7-9, 1989

District	Participant
Blackhawk VTAE District 6004 Prairie Road P.O. Box 5009 Janesville, WI 53547-5009	Michael Gagner, Division Chairperson,Business Occ. Leland Peich, Instructor Sandy Paulson, Instructor Harol Sincher, Instructor
Chippewa Valley Technical College 620 West Clairemont Avenue Eau Claire, WI 54701-1098	James Brown, Electromechanical Connie Solsrud, Nursing Tim Tewalt, Electromechanical Ron Krippner, Science Instructor
Fox Valley Technical College 1825 North Bluemound Drive P.O. Box 2277 Appleton, WI 54913-2277	Marvin Schroeder, Curriculum/Research Specialist
Lakeshore Technical College 1290 North Avenue Cleveland, WI 53015	Maureen Donovan, Curriculum Specialist
Mid-State Technical College 500 - 32nd Street North Wisconsin Rapids, WI 54494	James Prochnow, General Education Merlin Bauer, Real Estate/Marketing Bill Lindroth, Supervisor
Milwaukee Area Technical College 700 West State Street Milwaukee, WI 53233	Preston Baity, Police Science
Southwest Wisconsin VTAE Bronson Boulevard Fennimore, WI 53809-9989	Jolly Michel, Dean of Home Ec. Service Occ.
Western Wisconsin VTAE 304 North Sixth St., P.O. Box 908 La Crosse, WI 54602-0908	Ron Sellnau, Supervisor

ATTACHMENT C

Handout Materials

AGENDA

VTAE

ELEMENTS OF INSTRUCTION WORKSHOP

Tuesday, March 7, 1989 Mead Inn-Wisconsin Rapids

WORKSHOP INSTRUCTORS:

- Howard Lee, Co-Director, Center for Vocational, Technical & Adult Education, University of Wisconsin-Stout
- Bill Mamel, Consultant, Instructional Troubleshooters, Minneapolis, MN

7:30 - 8:00	Registration
8:00 - 8:30	Introduction, Objectives & Expectations - Howard
8:30 - 9:45	Professionalism and Overview of the Elements - Bill
9:45 - 10:00	**Break**
10:00 - 12:00	Selecting Objectives at the Correct Level - Bill
12:00 - 12:45	**Lunch with discussion**
12:45 - 2:45	Motivation - Howard
2:45 - 3:00	**Break**
3:00 - 3:15	Assignment - Howard
3:15 - 3:30	Closure - Bill

EVENING

6:30 - 8:00	**Consultation - Informal Discussion**

AGENDA

VTAE

ELEMENTS OF INSTRUCTION WORKSHOP

Thursday, March 9, 1989 Mead Inn-Wisconsin Rapids

8:00 - 8:30	Review/Objective - Howard
8:30 - 10:00	Micro-Teaching
10:00 - 10:15	**Break**
10:15 - 11:30	Continue Micro-Teaching
11:30 - 12:00	Debriefing - Bill and Howard
12:00 - 12:45	**Lunch with discussion**
12:45 - 1:30	Retention - Bill
1:30 - 1:45	**Break**
1:45 - 2:30	Transfer - Howard
2:30 - 3:00	Putting It All Together - Bill
3:00 - 3:30	Assignment/Feedback/Evaluation - Howard

EFFECTIVE STAFF DEVELOPMENT PROGRAMS HAVE THREE CRITICAL INGREDIENTS WHICH PROVIDE DIRECTION FOR THE PLANNING AND CONDUCTING OF ACTIVITIES. IN YOUR OWN WORDS, DESCRIBE THESE CRITICAL INGREDIENTS:

1.

2.

3.

IF YOU HAVE A CONCERN REGARDING THESE INGREDIENTS, PLEASE SHARE YOUR CONCERN WITH THE GROUP OR PRIVATELY IF YOU WISH.

IN YOUR PARTICULAR INSTRUCTIONAL SITUATION (TECHNICAL INSTITUTE, TECHNICAL COLLEGE, SCHOOL DISTRICT, OCCUPATIONAL TRAINING AND DEVELOPMENT, OR OTHER), WHAT ACTIVITIES ARE CURRENTLY BEING OFFERED WHICH INCLUDE ALL OF THE INGREDIENTS (THREE) NECESSARY TO CONDUCT AN EFFECTIVE STAFF DEVELOPMENT PROGRAM?

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

PEOPLE OEMONSTRATE VARYING LEVELS OF COMPETENCE WHEN THEY ARE REQUIRED TO PERFORM A TASK OR RESPONO TO A SPECIFIC SITUATION. IN YOUR OWN WORDS, (1) DESCRIBE THE LEVELS OF COMPETENCE (FOUR) AND (2) GIVE AN EXAMPLE FOR EACH LEVEL FROM YOUR OWN PERSONAL EXPERIENCE:

1. LEVEL_____

2. LEVEL_____

3. LEVEL_____

4. LEVEL_____

THE PROCESS OF LEARNING, AS RELATED TO AOULT LEARNERS, INVOLVES FOUR STEPS (AS LISTEO BELOW). IN YOUR OWN WORDS, (1) OESCRIBE WHAT EACH STEP MEANS ANO (2) GIVE AN EXAMPLE OR TWO FROM YOUR OWN EXPERIENCE AS TO HOW YOU HAVE ASSISTEO LEARNERS TO ACCOMPLISH EACH STEP:

STEPS

ACQUIRE INFORMATION

COMPREHENO THE VALUE OR MEANING OF THE INFORMATION

COMMIT TO ACT ON THE INFORMATION (INTENTION)

ACT ON THE INFORMATION

APPLICATION OF THE ELEMENTS OF INSTRUCTION

DESCRIBE THE SITUATION:

ELEMENT/ELEMENTS SELECTED:_____

REASON FOR SELECTION:

RESULT (IN TERMS OF PROMOTING LEARNING)

DECISIONS IN TEACHING

Educators have finally arrived at the point that professionals in medicine achieved when the latter discovered that germs and not evil spirits were causing much of the problem. We now know many cause-effect relationships in teaching and learning. As a result, we can use those causal relationships to promote student learning in the same way the doctor uses his medical knowledge to promote health. In both education and medicine we are learning more each day even though there still remains much we don't know.

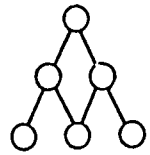
Whenever humans are involved, we are dealing with probability, not certainty. When the doctor prescribes, it is to increase the probability of the patient's recovery, not to guarantee it. In the same way, if teaching decisions and actions are based on the principles presented in this book and in the Mastery Teaching series of videotapes, the probability of students' learning will be increased but it will not be guaranteed.

There is no question but that genetic endowment and past experience influence students' learning but your own teaching decisions also have a powerful impact. Consequently, teaching is now defined as a ***constant stream of professional decisions made before, during and after interaction with the student; decisions which, when implemented, increase the probability of learning.*** Students learn more when they are taught effectively than they can learn on their own. *Even champions have coaches.*

For the last two decades, educators at the University of California, Los Angeles, have been studying teaching decisions and their implementation: the essence of the process of teaching. It was found that, regardless of who or what is being taught, all teaching decisions fall into three categories: (1) what content to teach next, (2) what the student will do to learn and to demonstrate learning has occurred, and (3) what the teacher will do to facilitate the acquisition of that learning. When those professional decisions are made on the basis of sound psychological theory and *if* those decisions also reflect the teacher's sensitivity to the student and to the situation, ***learning will be increased.*** Should errors be made in any of those three decisions, student learning can be impeded. Consequently, it is important for teachers to consciously and deliberately identify the decisions needing to be made in each category and base their decisions on research validated knowledge. Equally important is teachers' ability to "read" signals from students and to assess the learning situation so necessary adjustments will be made.

I The Content Decision

The first professional decision to be made is the answer to the question, "What will be taught." You may be thinking that decision has already been made. You're to teach English I, History of the United States, French II, Computer Science. Those subjects merely label the content area in which you, the teacher, need to make the critical decision about the particular part of that content you will teach *today.* To increase the probability of students' learning, that decision must reflect your knowledge of what that particular group of students already knows and what is next to be learned. The psychological generalization which guides your content decision is that basic concepts, simple generalizations and processes must be acquired before more complex learnings are achieved. Advanced processes and understandings are built on a pyramid of simpler ones.



complex understandings and processes

simpler generalizations and skills

simple concepts and behaviors

Therefore, to make the decision about the content you are going to teach successfully tomorrow, you need to determine which prior learnings are prerequisite to more complex ones and make sure those essential learnings have been *acquired* by your students (not "have been presented to") before advanced material is introduced.

Once the decision has been made about the "what" of teaching, the content decision, teacher and student effort should be directed to the acquisition of that new level of learning, not be dissipated on nonessential or tangential matters. It is tempting to spend class time on vivid or interesting "bird walks" that may distract attention from, rather than enhance understanding of more important issues. A typical example is, "By the way, that reminds me of something that happened _____." If "what happened" will help students understand what is being presented, by all means use the example. If what "happened" is tangential or only loosely related, don't waste time by introducing it. If you have loads of extra time or comedy relief needs to be introduced to brighten up the lesson, a "bird walk" might be forgivable, but most of us find that time and energy are in too short supply to be expanded on loosely associated material or random exchange between students and teachers. This does not mean you ignore students' nonrelevant

comments. a sign of skill in teaching to dignify a student's extraneous contribution without letting it dilute the lesson. "That's an interesting point that will come a little later," usually will handle a tangential contribution.

Then by all means *do* come to it later, either with that student after class or with the group at a time when it is relevant. "You remember Harry cited an example of_____."

Lest you think disciplining yourself in terms of your content decision imposes rigidity to your teaching, it doesn't. It adds the professional rigor that leads to successful learning. Remember, *you're the decision maker* and if, during class, a *better* idea emerges, by all means pursue it.

You may wish to delegate the content decision to your students and let them decide when they have achieved sufficient mastery to move on but, as their teacher, you can't delegate your responsibility for the results of that decision and for its potential to increase or interfere with the probability of their learning.

II The Decision Regarding Learning Behavior of the Student

While the first decision of teaching is based on content, the *what* of teaching, the second decision is directed to the *student behavior* that makes learning possible, the student's *how* of learning. There are two aspects of a student's learning behavior. One aspect is focused on the input modalities the student will use to acquire knowledge or skill. Will (s)he read, discuss, listen, observe, do? *There is no one best way to learn*, and use of a combination of these input behaviors usually is more effective then relying on only one.

Another aspect of the teacher's decision about learning behavior is focused on students' output which validates acquisition of the knowledge or skill. That output must be *perceivable* so you know (not hope) that students have achieved and are ready to move on to the next learning or whether you must reteach or extend practice of the current learning. Also, that student output behavior must *validate* that learning has been accomplished. Output can't be such that students can bluff, guess or be lucky in their demonstration of accomplishment. As with the content decision, the input and output student behavior decision also can be delegated to students but *not* your responsibility for the results of their decision.

Your *instructional objective* specifies the first two teaching decisions of 1) content and 2) behavior of the learner and brings both of them to the level of conscious professional decision making rather than leaving them as vague intentions or wishful thinking.

To make those two decisions more identifiable, in the examples below, the specific content is capitalized and the validating student behavior is written in italics. All instructional objectives begin with, "The Learner will...(T.L.w.)

T.L.w. *state* the SIX CATEGORIES OF PLANTS and *describe* the CHARACTERISTICS OF EACH.

T.L.w. *write* his/her INTERPRETATION OF ARNOLD's POEM.

T.L.w. *respond in German* to the QUESTIONS ON PAGE 37.

T.L.w. *diagram* the ASSERTIONS AND CONCLUSION.

T.L.w. *discuss* the CHANGES WHICH RESULTED FROM THE TREATY.

T.L.w. *solve* the QUADRATIC EQUATIONS ON PAGE 97.

Having an articulated instructional objective, rather than intuitive or subliminal intent, accomplishes two things. First, it helps you focus your teaching on the learning behavior which you will use to validate whether students have achieved the intended learning. Second, it encourages you to identify the prerequisite learnings which must be taught (and learned!) in order for students to achieve the intended results.

III The Decision Regarding Teacher Behavior

The third decision in teaching (note that this is the *third* decision not the first) is directed to your own teaching behavior; what *you* will do to increase learning. If you deliberately use principles of learning which research indicates are accelerants to student achievement, you will have power to increase your students' motivation to learn, the speed and the amount (rate and degree) of their learning, and their retention and appropriate transfer of that learning to new situations requiring creativity, problem solving and decision making. Principles of learning constitute a powerful pharmacy of alternatives from which you can create an effective learning prescription. Knowing principles of learning and deliberately and artistically using them is the hallmark of the master teacher. This book and the accompanying series of Mastery Teaching videotapes were developed to present some of these principles to you and thereby to help you consciously achieve master teaching.

The responsibility for making these three decisions of, (1) content (what to teach today and tomorrow), (2) behavior of the learners (which input modalities students are going to utilize and the student output that will validate successful accomplishment) and (3) your teaching behavior (utilization of principles of learning to accelerate achievement) sounds like a lot of professional decision making. It is! These decisions, however, are already being made by you either purposefully, intuitively,

or by default every day you teach. As you read, you will find that you already are using much of what is described in this book or shown in the Mastery Teaching Videotapes, but now you will have categories and labels for the decisions you are making and you will know the research that supports them. You may also learn some new techniques which will make your teaching not only easier but more predictably successful.

Each chapter in this book and each module in the videotape series will focus on some aspect of professional decision making to help you become more conscious of why you do what you are doing and, as a result, you will become increasingly effective as a teacher.

After you study this book and view the videotapes, you should have deliberately constructed a professional launching pad from which your own particular style and artistry in teaching can soar.

Bon voyage!

I. Content
II. Behavior of the Learner
III. Behavior of the Teacher

Write the number that describes the teacher decision (the three teaching decisions are noted above) by each statement.

The teacher is deciding whether:

____ A. The content should be Chaucer or Shakespeare.

____ B. To stand by a student to increase that student's concern or move to the other side of the room to lower concern.

____ C. To tell students that they need not worry if at first things are not clear, that everyone has trouble at first.

____ D. To have students write a paper or take a test to demonstrate their understanding.

____ E. To have students validate their comprehension by making a diorama or a time line.

____ F. To start with the ideas of Socrates or those of Plato.

____ G. To have students read the chapter or view a film.

____ H. To teach photosynthesis or respiration.

____ I. To praise a student for what he has accomplished or chide him for what he has not.

____ J. To teach by using examples in the book or to create original examples.

____ L. To indicate the number correct on a student's paper or the number incorrect.

____ M. To teach the critical attribute of assumptions and conclusions.

What's Wrong with Madeline Hunter?

by Madeline Hunter

"Never worry about your enemies, it's your friends who will sink you" was advice given me years ago. How true! As I look at the implementation of some so called "Hunter Models" I cringe. Our clinical theory of instruction was developed on the premise that the teacher is the decision maker. Some zealots have turned the model into a rigid, non creative misinterpretation which "lays on" teachers a way of teaching rather than identifying research based, cause-effect relationships which help teachers make educational decisions. Knowing cause and most probable effect frees teachers for artistic and successful teaching.

Briefly summarized, ours is a model which a) identifies professional decisions teachers must make, b) supplies research based cause-effect relationships to support these decisions and c) encourages the teacher to use data emerging from student and situation to augment or correct decisions in order to increase the probability of learning.

No one can tell a teacher what to do. Ours is an effort to tell the teacher what to consider before deciding what to do. Teacher decisions in this model emerge from propositional knowledge: knowing what has an effect on student learning. Propositions are those generalizations, validated by psychological research, which identify behaviors that affect learning such as: "Massing practice increases speed of learning. Distributing practice increases retention of what has been learned." These generalizations guide teaching decisions. From these propositions, educators who use the model must develop procedural knowledge: knowing how to translate propositions into effective teaching practice. This

implies that a teacher will be able to design "massed practice" so it remains meaningful and interesting. Decisions also must be made about the length of time between "distributed practice" so it maintains maximum efficiency. Propositions are easy to learn, performance procedures are much more difficult. Unless propositions are translated into procedures, however, the "never use a preposition to end a sentence with" syndrome occurs.

Finally, this model demands conditional knowledge: knowing when to use each proposition and why existing conditions in content, student, teacher and situation would indicate its use with whatever modifications are necessary. This is the essence of translating science into artistry in teaching.

Known by several names (A Clinical Theory of Instruction, ITIP, Mastery Teaching, PET, Clinical Teaching, Target Teaching, UCLA model, Hunter model), this model identifies the decisions all teachers must make regardless of content, age or ethnicity of the learner, style of teacher or mode of teaching (direct, indirect, discovery, lecture, cooperative learning--you name it!). Our model is analogous to nutrition theory. Regardless of the menu, age of the eaters, type of meal, service or preference of the cook, food to be nutritious must incorporate those nutrients which promote health. Using nutrition theory, a skilled cook can produce a variety of meals, served in a variety of ways to accommodate the taste of the eaters. In the same way a teacher can accommodate preferences of learners and his/her own style as long as those elements that promote learning are incorporated in planning, teaching, and evaluating. These elements have been described in detail elsewhere.(1)

Lets examine some criticisms which are based on misunderstandings, and some problems arising from mutations which are no part of the basic model.

1) Hunter's is a rigid model which stifles creativity.

On the contrary, this model provides the launching pad from which creativity can soar. All creativity is based on structure from which artistry and freedom emerge. The propositions of this model are exquisitly used by the gifted teacher, never abused. The Taj Mahal is not a violation of the propositions of physics, engineering and design, but a beautiful manifestation of an architect's inspired use of those propositions.

2) The model was created to evaluate teachers.

Not at all! This model was created to increase teaching excellence. Learning to use this model has changed many marginal teachers into effective ones and effective teachers into masters. With the orientation of this model, an observer can pinpoint inappropriate teaching decisions and behaviors then offer productive alternatives. Rather than general admonishments, "You need to tighten up your discipline--make your lessons more interesting--create more motivation in your students--develop better class routines," this model equips observer and teacher with knowledge, skills and the practical assistance that makes excellence attainable.

We can't save them all, but when we accept defeat we know it is not for want of help that is research based and so practical that the teacher must have been unwilling to or incapbable of using the help offered.

3) The Hunter model is great for direct teaching but does not apply to discovery learning or cooperative learning.

Not so! This model undergirds the decisions made in every method of teaching. Teaching decisions may be delegated to the learner. Any style of teaching or learning may be used, but the teacher remains responsible for learning outcomes. The more skilled the teacher in using this model, the more independent and successful the learners can become and the greater is the variety of teaching and learning styles being used.

4) The Hunter model applies only to elementary teaching.

This model is equally effective in secondary and university teaching.(2) It applies to every human interaction which is conducted for the purpose of learning. A faculty meeting can be a classic example of violation of what is known about human learning. Faculty meetings, PTA meetings, School Board meetings, Rotary Club meetings, Scout meetings and grade level meetings are improved by conscious application of the principles of human learning. Parent conferences, assemblies, working with a disturbed or unhappy student, discipline of a group or of an individual student, all involve those same principles which affect human learning. An educator who can artistically implement principles of learning will be more successful with any of the above situations.

5) The Hunter model helps teachers who are having difficulty but is not needed by successful teachers.

A great many of the basic propositions in this model were identified by observing successful teachers. Psychological research enabled us to label these generalizations and explain why they worked. Teachers

moved from intuitive to purposeful behavior. They knew what they were doing, why they were doing it and did it on purpose. As a result, students' learning became more predictable and more successful. Teachers consistently express their gratitude for bringing this predictability to their planning and teaching. All professionals continue to grow as their knowledge, skills and artistry increase. Teachers are no exception. In the same way that use of this model speeds up learning for both slow and fast learners but does not make them equal, use of this model enables less expert teachers to become more effective and expert teachers to become proficient educational artists.

6) This model expects the impossible of the typical teacher.

Not at all! Student teachers learn to use theory to make productive teaching decisons with results that are gratifying to them, to their students and to their supervising teachers. Using this model results in more inspiration and less perspiration for all teachers. Knowledge and skill make all work easier to accomplish successfully and artistically. This model is not based on working harder but on working smarter.

7) "Elements of Effective Instruction" must be in every lesson.

Horrors no! That "white sauce receipe" for teaching was designed to help teachers plan. In no way can a teacher be judged by the inclusion of all those elements. In fact, many lessons will incorporate only a few elements as, over a period of time, students progress toward achievement of complex learnings. Any observer who uses a check list to make sure a teacher is using all seven elements does not understand the model.

8) If a little is good, more is better.

Probably not! Teachers can over reinforce, or "motivate" when that is not needed. Students can practice beyond productivity. Students can make decisions that are not facilitating to their growth. Educators must develop conditional knowledge to determine "under what conditions," procedural skills should be used. For example, if students are fatigued or bored by practice, that practice should be changed or discontinued even though students have not mastered the skill. It's "common sense", something which can be uncommon in education. Frequency counts are no more useful to teachers than to doctors. How many times pills or surgery are prescribed does not tell you if a doctor is making valid medical decisions.

9) Observers make judgments about a teacher's decisions without checking with the teacher as to the reasons for those decisions.

Checking the reasons for the teacher's decisions will often reveal excellent professional thought processes. One the other hand, an observer can frequently "see" what was not visable to the teacher who is busy teaching. (The general with binoculars in the lookout can see more of what's going on than can the soldier who is making it happen in the trenches.) Communication between teacher and observer as to the basis for each one's thinking results in learning for both.

10) Too much is expected too soon.

This model is deceptively simple in conception, incredibly complex in application. It is a quantum leap from "knowing" to artistic practice. Frequently, a teacher is "exposed" in a workshop to sequence theory, practice theory or whatever and then it is naively assumed that theory will appear magically and correctly in the teacher's subsequent practice.

Artistic performance, whether in music, writing, physical skills or teaching results from countless hours of practice with coaching to increase productive responses and remediate or elminate unproductive ones. Frequently after inservice, observation and coaching within the teacher's classroom are not available. Consequently, new learning may never get translated into subsequent teaching, or it appears in a form which is not as productive as would be desired. Artistic and effective teaching results from a well-planned staff development program. The stages necessary to translate knowledge into artistic practice have been described elsewhere.(3)

11) Promoters of the model want to begin with teachers.

Knowledge of effective teaching should first be learned by central administrators and principals, because the district's local leaders will make the greatest impact on teaching excellence. Administrators are not engaged in daily teaching so many have become "rusty" and have lost the kills they once possessed. Also, most of those former teaching skills were intutitive rather than articulate and theory-based so they cannot be transmitted. As a result, many administrators and supervisors attempt to clone themselves and get teachers to imitate the way they "used to do it." Instead, they need to use theory to help each teacher use his/her own style to achieve excellence.

In addition, administrators need to internalize skills so the administrator becomes a model of what is expected of teachers. Otherwise a "do as I say not what I do" situation exists.

12) Districts provide a "one shot" or one year exposure then move on to a new focus.

A major problem of inservice is the patch work effect of a little of this and a little of that so the the teacher sees no relationship between the patches. Our model provides the scaffolding on which each additional inservice focus can be added. These additions become an extension or refinement of the undergirding propositons of effective teaching. Seeing the relationship between the three categories of decisions which all teachers must make enables a teacher to assimilate, accommodate and use new professional information, techniques, organizational schemes, methods and discoveries. We can't just hope that professional integration will occur, we must provide for it.

13) Once teachers or administrators have had the training, they are "finished."

A professional is never finished learning that which increases professional effectiveness. Consequently, systematic and periodic renewal is essential for both teachers and administrators. In addition, even with coaching, undesirable mutations of practice emerge, spontaneous recovery of old habits occurs, and forgetting of some new learning is inevitable. For these reasons, all educators need scheduled renewal and revitalization.

14) Leaders are not adequately trained.

"Trainers" take a quick "crash course" to acquire the propositional knowledge of this model, then are expected to teach it to others. The trainers have not had time to internalize procedural knowledge so they can't translate propositions into their own teaching behaviors. In addition, they lack the conditional knowledge of knowing when and under

what conditions to use the generalizations. Frequently, trainers make the error of teaching "rules" to govern teachers rather than generalizations on which to base teaching decisions.

From original "exposure," usually a two year period is required to translate knowlege into valid and artistic practice. Short circuiting that time can result in the "never use a proposition to end a sentence with" syndrome where trainers are violating the very principles they are teaching.

15) There has been no research to support this model.

Every proposition of this model was derived from research in human learning. Any beginning psychology text identifies the research basis for the propositions. The model was originally validated in Project Linkage: a project funded by the California State Department of Education in a difficult Los Angeles innercity school. Outside evaluation demonstrated increase in student learning and teacher satisfaction, decrease in discipline problems and vandalism. Since then, major research studies (such as BTES and Effective Schools) have corroborated the propositions of this model. Many projects, however, have attempted to evaluate results from one short training or exposure without checking whether the propositions were translated into procedural and conditional teacher behavior in the classroom.

Models are judged on their ability to guide behaivor, predict outcomes and stimulate research, not on their being the final answer. This model was developed to accomplish all three purposes. If it has contributed to educators' use of research based knowledge to make and implement more successful professional decisions, and to the constant addition of new research based propositions which guide future actions

to increase teacher and student success and satisfaction in schooling, then the Hunter model will have served its purpose.

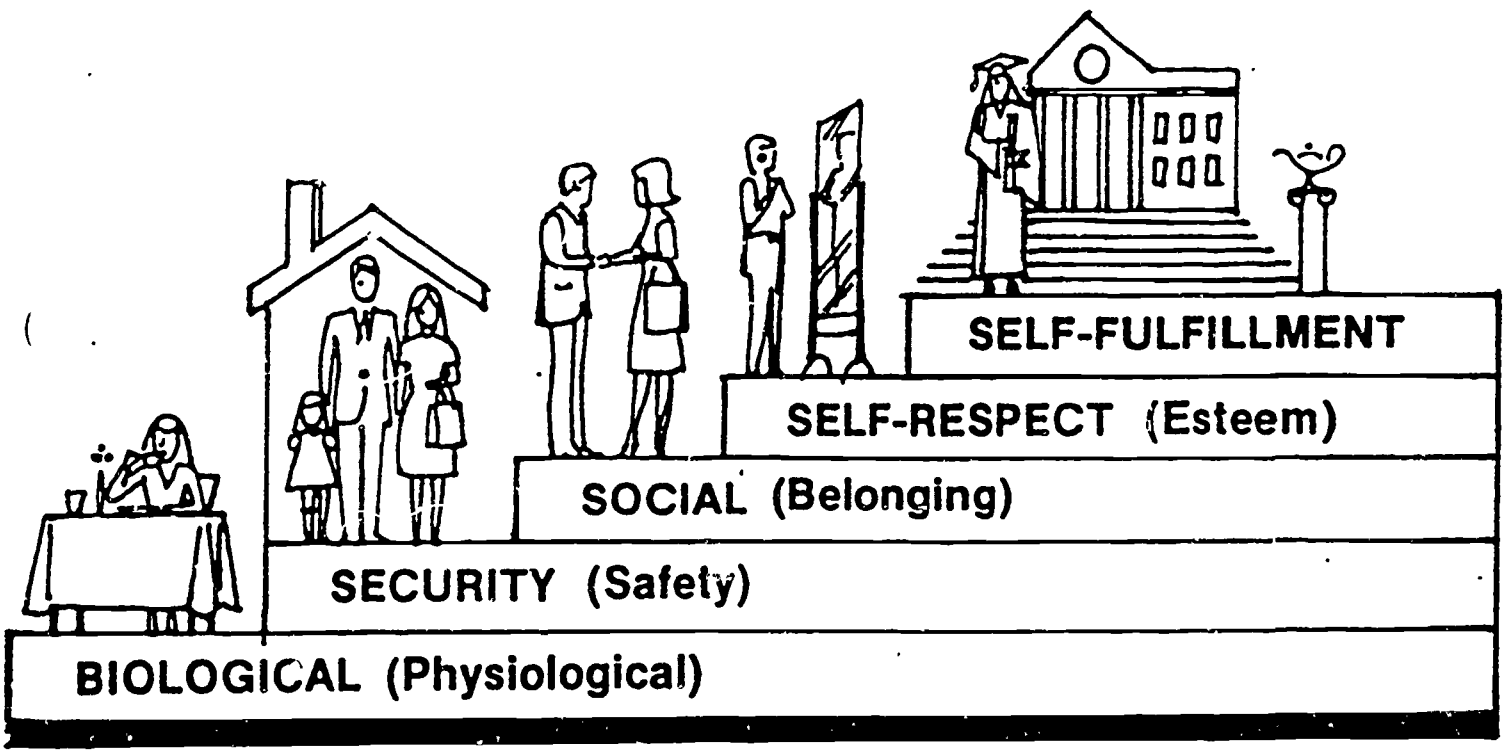
Footnotes

[1]Hunter, M. "Teaching is Decision Making." Educational Leadership, October 1979.

[2]Hunter, M. Mastery Teaching. Tip Publications, P.O. Box 514, El Segundo, California.

[3]Hunter, M. & Russell, D. "Critical Attributes of a Staff Development Program to Increase Instructional Effectiveness." In Press.

MASLOW'S HIERARCHY OF HUMAN NEEDS



MAINTENANCE ISSUES AND TREATMENTS

PHYSICAL CONDITIONS

- Heating
- Lighting
- Work Space
- Noise Level
- Equipment
- Recreational Facilities
- Medical Facilities
- Parking Facilities
- Furniture, Carpeting
- Office Location

SECURITY

- Organization Stability
- Fairness of Company Rules
- Job Orientation
- Grievance Procedures
- Seniority Rights
- Supervisor Knows His or Her Job
- Supervisor Provides Clear Work Instruction
- Supervisor Gives Good Training
- Supervisor Provides Objective Feedback on Performance
- Fairness of Individual Supervisor
- Hospitalization Plans
- Pension Program

ECONOMIC

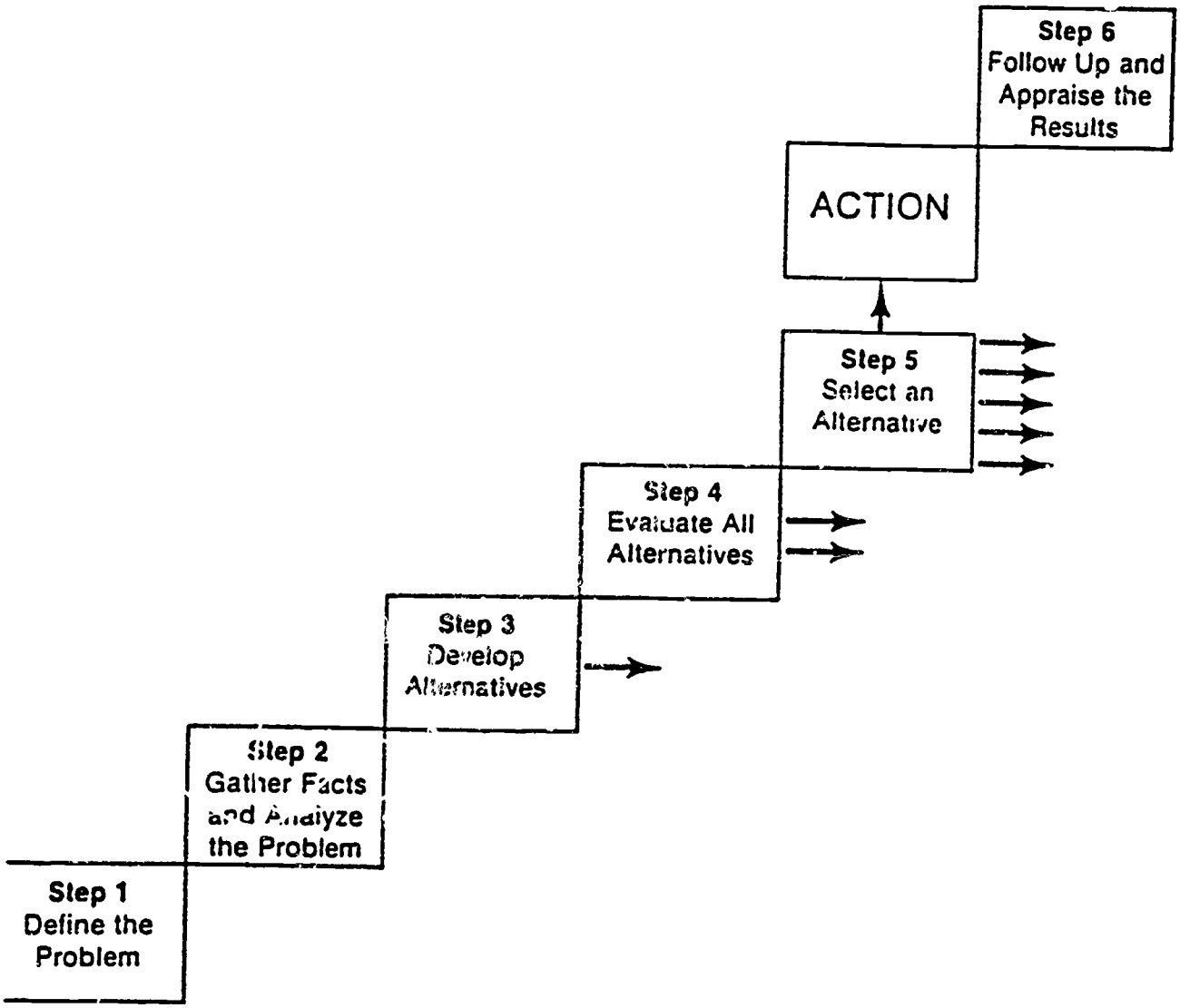
- Wages
- Pay Increases (automatic)
- Paid Vacations & Holidays
- Profit Sharing
- Tuition Aid
- Stock Options
- Credit Union
- Size & Luxury of Office
- Paid Parking
- Hospitalization Plans
- Pension Plans

SOCIAL

- Friendliness of Supervisor
- Friendliness of Co-Workers
- Work Teams
- Cliques
- Coffee Breaks
- Company Athletic Teams
- Special Interest Groups
- Communications Program

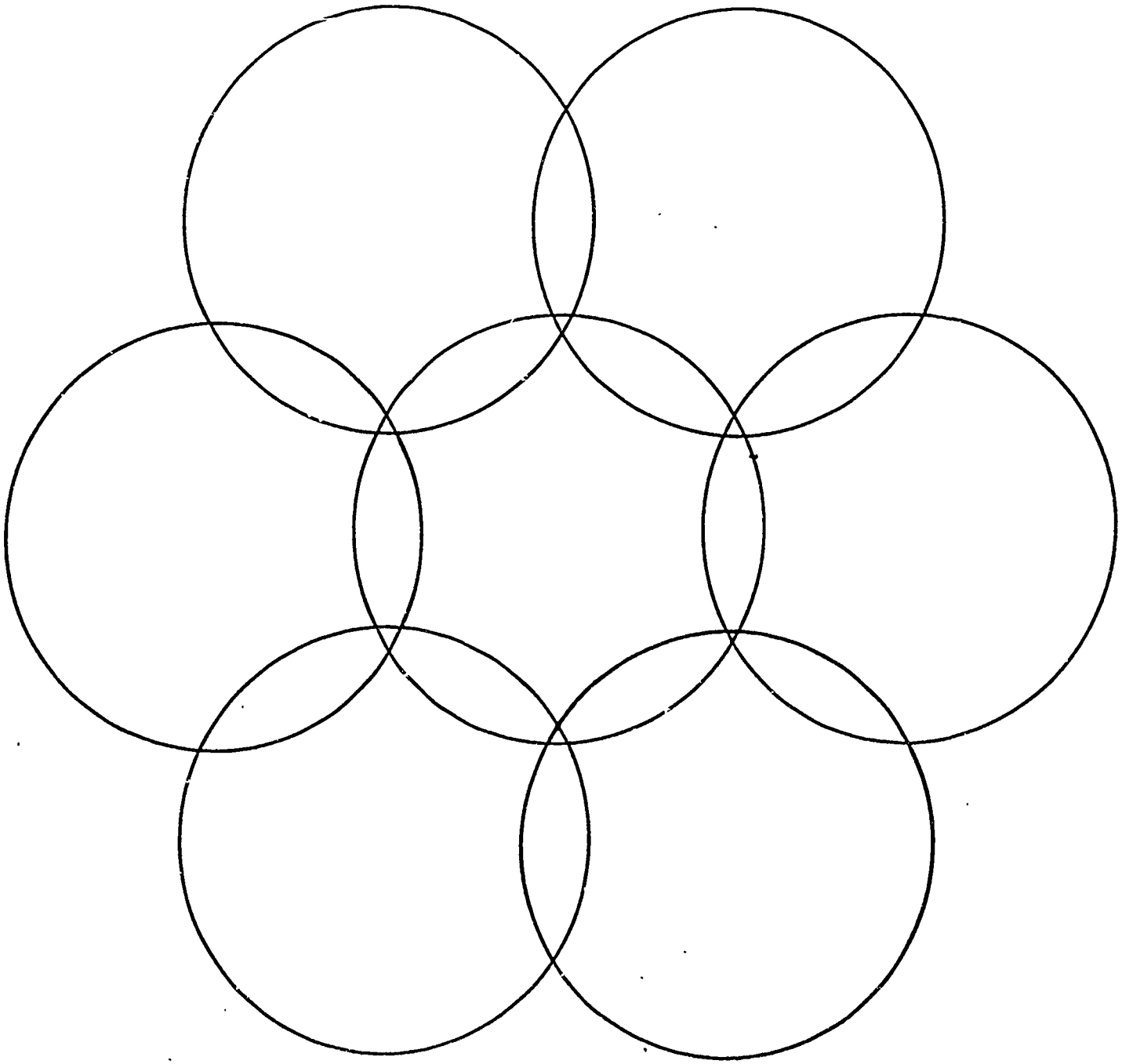
MOTIVATORS	KEY EMPLOYEE PERCEPTIONS	EXAMPLES OF THINGS, ACTIVITIES, SUPERVISORY TREATMENTS WHICH, WHEN EXPERIENCED, CAUSE AN EMPLOYEE TO FEEL REAL ACHIEVEMENT, RECOGNITION, PARTICIPATION OR GROWTH.
ACHIEVEMENT A sense of personal worth or pride resulting from completing a task or job. Key to achievement being experienced is the employee believing what he/she is working at has some importance and/or presents some challenge. Achievement is most often experienced at the completion of an activity or major phase of an activity.	The task or job must be perceived as having a purpose and being difficult	• Completing a critical assignment on your own • Developing a new solution to an existing problem • Implementing a solution to an existing problem • Finishing a project "on time" and "within budget" • Taking a job/task from start to finish
RECOGNITION A sincere expression of approval or appreciation given to a person for a job related "achievement". The giver of the recognition must be judged by the receiver to be honestly acknowledging a truly special effort by the receiver.	The expression of approval must be perceived as earned (non-automatic) and honest	• Receiving a promotion • Receiving verbal praise from your supervisor • Receiving written praise for your efforts • Being given new levels of responsibilities or authorities • Being "listened to" by your manager
PARTICIPATION Making a personal contribution or having some real involvement into the decisions and issues which most influence the employee's job. Participation can occur at the department level, (employee contributing to critical department decisions) *or* at the individual job level (employee involved in deciding key issues related to their own work).	The involvement or contributions must be real. The input and ideas must be asked for, listened to, and used.	• Being allowed to establish your own work goals • Being allowed to decide, on your own, how you will handle a critical task • Being part of a meeting which examines and decides key issues • Being asked your ideas about a change before the change has been decided
GROWTH Working on assignments or tasks which allow you to acquire new skills, new knowledge, new experiences, etc., which help you move closer to your own personal or professional goals.	The new "things" being experienced or acquired must be consistent with what the employees want for themselves.	• Being given new responsibilities or authorities within the same job • Receiving a promotion • Attending a training program • Moving to another job at the same level

STEPS IN THE DECISION-MAKING PROCESS



Biological	
Safety/Security	
Social/Love	
Self-Esteem	
Self-Actualization	

TEACHER RESPONSIBILITIES



CRITICAL BEHAVIORS OF THE TEACHER

1.

2.

3.

4.

DEFINITION OF TEACHING

WHAT DOES IT MEAN TO YOU?

PLANNING A TEACHING EPISODE

Objective: Participants will apply their knowledge and understanding of Teaching to the Objective, Correct Level of Difficulty, Moniter and Adjust, Motivation and Active Participation by completing this worksheet.

1. If I want my students to proofread their work before turning it in, I_____

_____

_____

2. After I give directions to the class on work they are to do, I _____.

_____

_____

_____

3. While I am presenting information to the entire class, two students are talking to each other in the back of the room. I will _____

_____

_____

_____

4. To increase participation of all students in a class activity, I _____

_____

_____

_____

5. To increase the probability that the students will listen while I'm giving directions, I _____

_____

_____

_____

6. When I am using a worksheet or assignment with the whole class, I can provide for individual differences either high or low by _____

_____

_____

_____

7. An example of how I can provide information to my students on how they are doing during the course of a lesson is _____

_____

_____

_____

8. To help me determine at the end of a lesson whether my objective was met so I can formulate my objective for the next lesson, I _____

_____

_____

_____

LEARNER ASSESSMENT

According to the UCLA Model (Hunter), there are four Essential Elements of Effective Instruction. Name the four:

1. _____
2. _____
3. _____
4. _____

Anticipatory set is a "focusing" principle of learning. What are the critical attributes of anticipatory set?

1. _____
2. _____
3. _____

Teachers make many decisions as they plan their actions to conduct an instructional episode. In your own words, name the factors to be considered in designing a lesson:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

There are four major classifications for the principles of learning. Name them:

1. _____
2. _____
3. _____
4. _____

PRINCIPLES OF LEARNING*

MOTIVATION	RATE AND DEGREE	RETENTION	TRANSFER
Success	Meaning	Meaning	Past to Present Situation
Knowledge of Results	Participation	Degree of Original Learning	Identification of Similarity
Interest	Modeling		
Feeling Tone	Motivation (Intent)	Feeling Tone	Degree of Original Learning
Level of Concern	Reinforcement	Practice Schedule	
Attribution	Set	Transfer	Generalization
	Transfer		Rules
	Practice Schedule		Probability Statements
	Level of Aspiration		Critical Attributes
	Degree of Original Guidance		SIMILARITY Present to Future Situation
	Hemisphericity		Relationship of Similarity to Future Situation (Simulation)
	Vividness		
	Observation		Degree of Original Learning
	Knowledge of Results		Generalization
	Learning Task Properties		Rules
	[Closure]		Probability Statements
			Critical Attributes

*UCLA Model

SELECTING OBJECTIVES AT THE CORRECT LEVEL

Statements

Condition(s) _____

_____

_____

Content _____

_____

_____

_____

Thought Process _____

_____

_____

_____

Criteria _____

_____

_____

_____

Write in the correct level of Bloom's Taxonomy on the line provided.

Knowledge
Comprehension
Application
Analysis
Synthesis
Evaluation

_____ 1. Name seven states.

_____ 2. Design a house.

_____ 3. Classify flowers.

_____ 4. Drive a vehicle.

_____ 5. Summarize the discussion.

_____ 6. Judge a beauty contest.

_____ 7. Plan a family reunion.

_____ 8. Predict the outcome.

_____ 9. Define in your own words.

_____10. List all the presidents.

_____11. Choose the best option.

_____12. Organize your files.

_____13. Defend nuclear power.

_____14. Arbitrate a conflict.

_____15. Sketch a map of your community.

_____16. Distinguish between education and training.

_____17. Compare 1985 with 1885.

_____18. Diagnose a malfunction.

_____19. Program a computer.

_____20. Compare salt and sugar.

TAXONOMY OF THE COGNITIVE DOMAIN

List in order of complexity the six levels of the taxonomy.

Next to each level write, in your own words, what the thought process is for each level.

LEVEL	THOUGHT PROCESS
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____

SELECTING ACTION VERBS FOR BEHAVIORAL STATEMENTS

WORDS OPEN TO INTERPRETATION

To Know
To Understand
To Appreciate
To Believe
To Have Faith
To Enjoy
To Communicate
To Empathize

WORDS OPEN TO FEWER INTERPRETATIONS

COGNITIVE

To Identify
To Recognize
To Recall
To List
To Match
To Discriminate (Between)
To Discriminate (Among)
To Calculate
To Solve
To Compare
To Differentiate
To Name
To Describe
To Write
To Evaluate
To Diagnose

PSYCHOMOTOR

To Remove & Replace
To Construct
To Select
To Measure
To Read
To Assemble
To Inspect
To Complete
To Diagnose & Prescribe
To Lift
To Carry
To Mend
To Disect
To Administer

AFFECTIVE

To Express Satisfaction
To Express Likes
To Express Preferences
To Be Cooperative
To Be Well Groomer
To Be Neat
To Be Prompt
To Follow Rules
To Care for Equipment
To Be Poised
To Be Pleasant
To Be Friendly
To Be Affirmative
To Respond Positively
To Be Attentive

EI-AV

COMPLEXITY LEVELS OF BEHAVIORS

PSYCHOMOTOR	COGNITIVE	AFFECTIVE
PERCEPTION	KNOWLEDGE	RECEIVING
SET	COMPREHENSION	RESPONDING
GUIDED RESPONSE	APPLICATION	VALUING
MECHANISM	ANALYSIS	ORGANIZATION
COMPLEX RESPONSE	SYNTHESIS	CHARACTERIZATION
ADAPTION	EVALUATION	
ORGANIZATION		

BLOOM'S TAXONOMY OF COGNITIVE THINKING

LEVEL	HOUGHT PROCESS	BEHAVIORAL INDICATORS (OVERT)
Knowledge	Ability to recall and recognize facts, concepts or principles.	List, label, read, define, repeat, record, name, match
Comprehension	Ability to interpret, understand and grasp the meaning of information, to summarize in own words; to translate into a different form of communication.	Explain, show, identify, describe, tell, discover, infer, report, discuss, express, give examples.
Application	Ability to apply previously acquired knowledge and information to a new or concrete situation; to an unfamiliar situation; to a situation which has a new "slant".	No! Use dramatize, operate, model, construct, relate, generalize, code, draw, calculate, reconstruct, illustrate, demonstrate, solve.
Analysis	Ability to "break down" material into its component parts so that organizational structure may be understood; perceive relationships and patterns; see cause and effect.	Deduce, compare, contrast, combine, discriminate, experiment, question, diagram, examine, distinguish, classify, outline.
Synthesis	Ability to analyze the parts and put them together to form a whole; to develop original ideas; propose options.	Create, imagine, plan, organize, predict, assume, translate, collect, hypothesize, design, derive, arrange, assemble, invent. compose.
Evaluation	Ability to make judgments based on evidence and determine the value of material based on definite criteria.	Appraise, judge, evaluate, validate, justify, criticize, select, assess, defend, rate, determine, decide and support decision, "yes or no".

MASLOW'S HIERARCHY OF NEEDS

We have argued that the behavior of individuals at a particular moment is usually determined by their strongest need. It would seem significant, therefore, for managers to have some understanding about the needs that are commonly most important to people.

An interesting framework that helps explain the strength of certain needs was developed by Abraham Maslow. According to Maslow, there seems to be an hierarchy into which human needs arrange themselves, as illustrated in Figure 2.11.

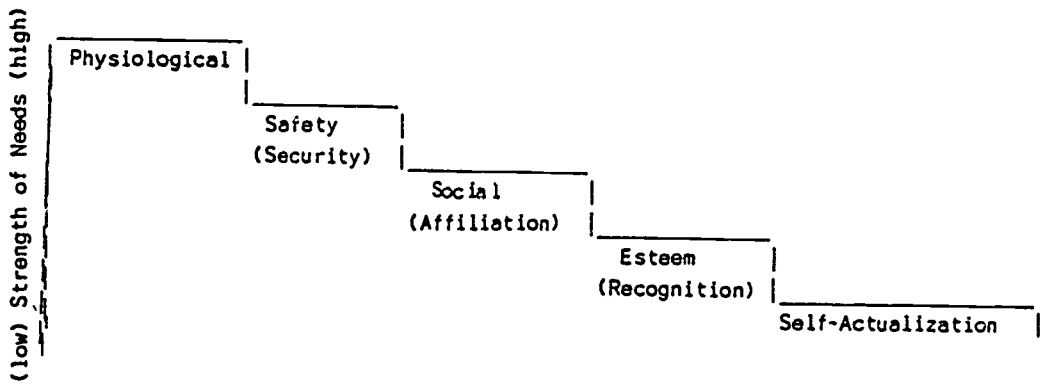


Figure 2.11 Maslow's hierarchy of needs.

The physiological needs are shown at the top of the hierarchy because they tend to have the highest strength until they are somewhat satisfied. These are the basic human needs to sustain life itself-food, clothing, shelter. Until these basic needs are satisfied to the degree needed for the sufficient operation of the body, the majority of a person's activity will probably be at this level, and the other will provide little motivation.

But what happens to a person's motivation when these basic needs begin to be fulfilled? Rather then physiological needs, other levels of needs become important, and these motivate and dominate the behavior of the individual. And when these needs are somewhat satiated, other needs emerge, and so on down the hierarchy.

Once physiological needs become gratified, the safety, or security, needs become predominant, as illustrated in Figure 2.12. These needs are essentially the need to be free of the fear of physical danger and deprivation of the basic physiological needs. In other words, this is a need for self-preservation. In addition to the here and now, there is a conc .n for the future. Will people be able to maintain their property and/or job so they can provide food and shelter tomorrow and the next day? If an individual's safety or security is in danger, other things seem unimportant.

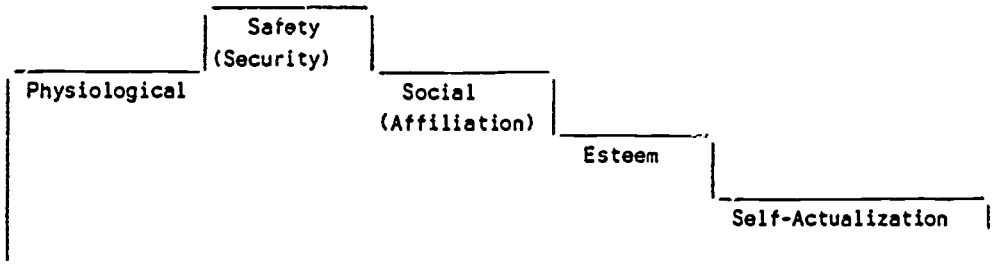


Figure 2.12. Safety need when dominant in the need structure.

Once physiological and safety needs are fairly well satisfied, social or affiliation will emerge as dominant in the need structure, as illustrated in Figure 2.13. Since people are social beings, they have a need to belong and to be accepted by various groups. When social needs become dominant, a person will strive for meaningful relations with others.

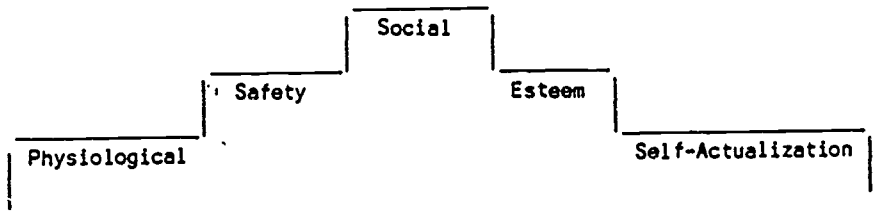


Figure 2.13. Social need when dominant in the need structure.

After individuals begin to satisfy their need to belong, they generally want to more than just a member of their group. They then feel the need for esteem- both self-esteem and recognition from others. Most people have a need for a high evaluation of themselves that is firmly based in reality-recognition and respect from others. Satisfaction of these esteem needs produces feelings of self-confidence, prestige, power, and control. People begin to feel that they are useful and have some effect on the environment. There are other occasions, though when persons are unable to satisfy their need for esteem through constructive behavior. When this need is dominant an individual may resort to disruptive or immature behavior to satisfy the desire for attention-a child may throw a temper tantrum, employees may engage in work restriction or arguements with their coworkers or boss. Thus, recognition is not always obtained through mature or adaptive behavior. It is sometimes garnered by disruptive and irresponsible actions. In fact, some of the

social problems we have today may have their roots in the frustration of esteem needs.

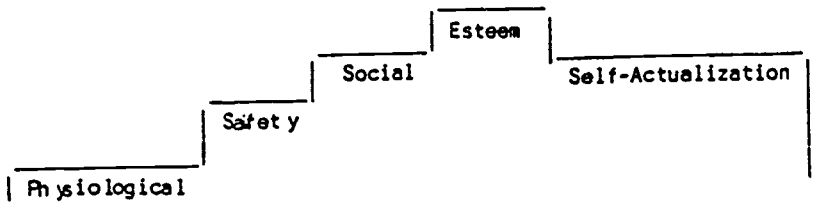


Figure 2.14. Esteem need when dominant in the need structure.

Once esteem needs begin to be adquately satisfied, the self-actualization needs become more prepotent, as shown in Figure 2.15. Self-actualization is the need to maximize one's potential, whatever it may be. A musician must play music, a poet must write, a general must win battles, a professor must teach. As Maslow expressed it, "What a man can be, he must be." Thus, self-actualization is the desire to become what one is capable of becoming. Individuals satisfy this need in different ways. In one person it may be expressed in the desire to be an ideal mother; in another it may be expressed athletically; in still another, by playing the piano.

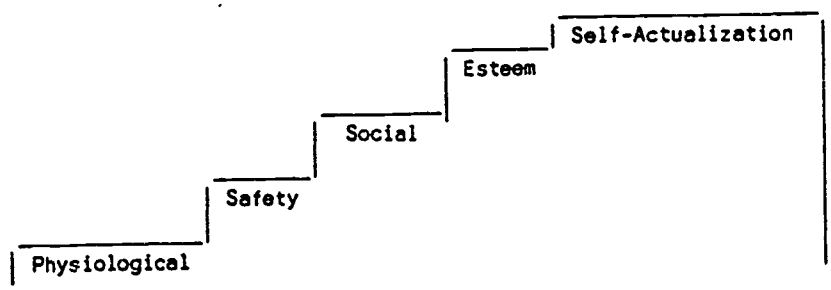


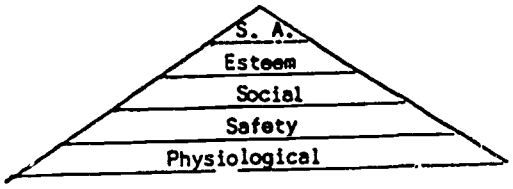
Figure 2.15 Self-actualization needs when dominant in the need structure.

In combat, a soldier may put his life on the line and rush a machine-gun nest in an attempt to destroy it, knowing full well that his chances for survival are low. He is not doing it for affiliation or recognition, but rather for what he thinks is important. In this case, you may consider the soldier to have self-actualaized-to be maximizing the potential of what is important to him at that time.

The way self-actualization is expressed can change over the life cycle. For example, a self-actualized athlete may eventually look for other areas in which to maximize potential as his or her physical attributes change over time or as his or her horizons broaden. In addition, the hierarchy does not necessarily follow the pattern described by Maslow. It was not his intent to say that this hierarchy applies universally. Maslow felt this was a typical pattern that operates most of the time. He realized, however, that there were numerous exceptions to this general tendency. For example, the late Indian leader, Mahatma Gandhi, frequently sacrificed his physiological and safety needs for the satisfaction of other needs when India was striving for independence from Great Britain. In his historic fasts, Gandhi went weeks without nourishment to protest governmental injustices. He was operating at the self-actualization level while some of his other needs were unsatisfied.

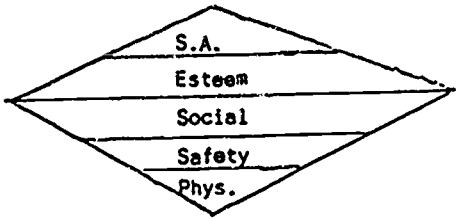
In discussing the preponderance of one category of need over another, we have been careful to speak in such terms as "if one level of needs has been somewhat gratified, then other needs emerge as dominant." This was done because we did not want to give the impression that one level of needs has to be completely satisfied before the next level emerges as the most important. In reality, most people in our society tend to be partially satisfied at each level and partially unsatisfied, with greater satisfaction tending to occur at the physiological and safety levels than at the social, esteem, and self-actualization levels. For example, people in an emerging society, where much of the behavior engaged in tends to be directed toward satisfying physiological and safety needs, still operate to some extent at other levels. Therefore, Maslow's hierarchy of needs is not intended to be an all-or-none framework, but rather one that may be useful in predicting behavior on a high or a low probability basis. Figure 2.16 attempts to portray how people in an emerging nation may be categorized.

Figure 2.16 Need mix when physiological and safety needs are high strength.



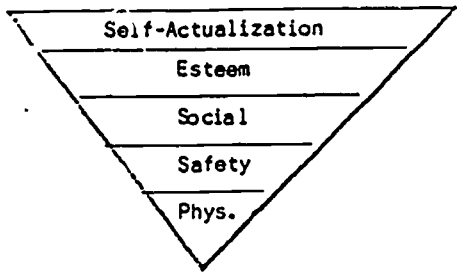
Many people in our own society at this time might be characterized by very strong social or affiliation needs, relatively strong esteem and safety needs, with self-actualization and physiological needs somewhat less important, as shown in Figure 2.17.

Figure 2.17 Need mix when social needs are high strength and self-actualization and physiological needs are less important.



Some people, however, can be characterized as having satisfied to a large extent the physiological, safety, and social needs, and their behavior tends to be dominated by esteem and self-actualizing activities, as shown in Figure 2.18. This will tend to become more characteristic if standards of living and levels of education continue to rise. These are intended only as examples. For different individuals, varying configurations may be appropriate. In reality they would fluctuate tremendously from one individual or group to another.

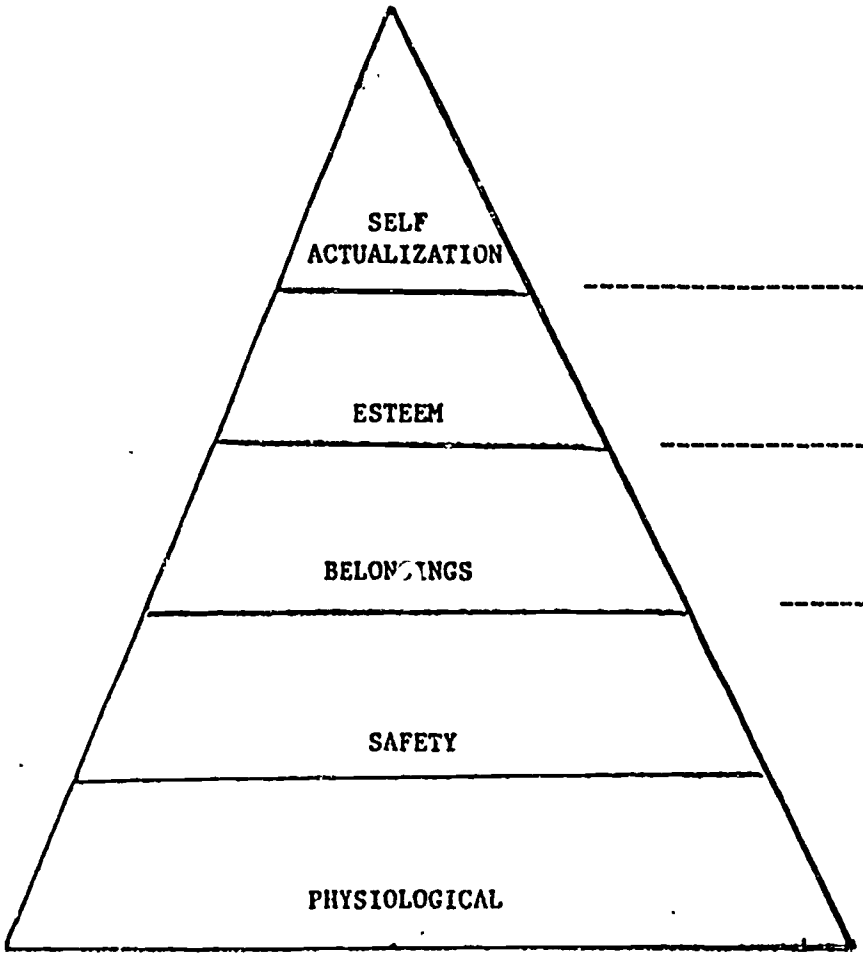
Figure - 2.18 Need mix when esteem and self-actualization needs are high strength.



Clare W. Graves has developed a theory that seems to be compatible with Maslow's hierarchy of needs. He contends that human beings exist at different "levels of existence." "At any given level, an individual exhibits behavior and values characteristic of people at that level; a person who is centralized at a lower level cannot even understand people who are at a higher level." According to Graves, "most people have been confined to lower [subsistence] levels of existence where they were activated by needs shared with other animals. Now, Western man appears ready to move up to a higher [being] level of existence, a distinctly human level. When this happens there will likely be a dramatic transformation of human institutions."

MASLOW'S HIERARCHY NEEDS

NEED HIERARCHY



PERSONAL MOTIVATION

SELECT OBJECTIVES AT THE CORRECT LEVEL

A. WHAT ASSUMPTIONS DO WE MAKE ABOUT LEARNING WHEN DETERMINING THE CORRECT LEVEL?

1.

2.

3.

B. DEFINE TASK ANALYSIS

C. WHAT THREE KINDS OF DIAGNOSES ARE AVAILABLE THAT HELP DETERMINE WHAT TO TEACH?

D. WHAT IS THE DEFINITION OF THE SELECT OBJECTIVES AT THE CORRECT LEVEL?

TOPIC: CORRECT LEVEL OF DIFFICULTY

FACTOR: Task Analysis

- The process the teacher uses to identify increments of learning that accomplish the objective

- Identifying sequential, logical steps that lead the learner toward the objective

- The breakdown of the learning into its essential parts

- A process that identifies subsets or increments of learning that lead to the accomplishment of an objective

FACTOR: Diagnostic Activities

- Pre-instructional tasks used to determine what students already know, need to know, and possibly how they might best learn the objective

- Pre-instructional activities which assess the incremental step of learners

- Pre-instructional diagnosis to determine students' current level of understanding and/or knowledge

- Methods for examining student understanding to determine the appropriate instructional level

TEACHING TO THE OBJECTIVE WORKSHEET

1. KNOW THE MEANING OF THE PLEDGE OF ALLEGIANCE

2. UNDERSTAND THE STEPS FOR LIGHTING A WELDING TORCH

3. TEAR A SHEET OF FOLDED PAPER.

4. UNDERSTAND THE STEPS FOR MAKING COOKING PASTA.

5. PLAY A BOARD GAME.

DIRECTIONS:

1. REWRITE THE OBJECTIVE IF YOU WISH TO MAKE IT MORE SPECIFIC (A TIGHTER VERB; LEVEL OF PERFORMANCE).
2. WRITE A ROUGH OUTLINE OF INFORMATION YOU WOULD PRESENT TO TEACH THE CONTENT.
3. WRITE 2 QUESTIONS YOU WOULD ASK STUDENTS ABOUT THE OBJECTIVE.
4. IDENTIFY ONE ACTIVITY YOU WOULD USE WHICH IS CONGRUENT TO THE OBJECTIVE.

DESIGNING ACTIVITIES/ACQUIRING INFO

LEARNING MAY OCCUR WHEN:

Observing the behavior of others

Observing the performance of others

Observing "things"

Fantasizing

Contemplating, reflecting, or mediating

Brainstorming

Role playing

"Acting"

Involved in sensual pleasures

Questioning others

Questioning one's self

Planning

Involved in intuitive thought

Experimenting

Interacting with a computer

"Using tools, materials, and equipment

Teaching others

Acting as a mentor

Sleeping

Analyzing dreams

Solving problems

In a hypnotic state

Involved in a "first-time activity"

Conducting research

Analyzing feedback

Imitating others

Playing games

Interacting with others

Debating

Practicing

Designing one's own experiences

Responding to feedback

Reading printed material

Listening to others

Sharing experience

By Accident

_____

_____

_____

_____

_____

_____

AND ON, AND ON, AND ON.....

ASKING QUESTIONS

TO AROUSE INTEREST AND CURIOSITY

At the beginning of an instructional episode, questions can be used as part of the set to focus the attention of the learner on the new learning

TO STIMULATE DISCUSSION

Questions at the Application level and above (Bloom) that are thought-provoking facilitate stating of reactions by the learner

TO CHANNEL THINKING

Questions can be used to direct thinking, keep the learner "on track", and focus on the objective.

TO OBTAIN THE ATTENTION OF AN INDIVIDUAL LEARNER

In this case, the question should be asked with the same feeling tone as others, and the response to the effort of the learner should be to dignify the answer.

TO HELP A TIMID PERSON TO EXPRESS THOUGHTS

It is important in this particular instance to allow sufficient time for the learner to respond

TO CHECK FOR UNDERSTANDING

Questions relevant to the material being covered will provide you with information as to whether you have accomplished what you intended to when providing information. Checking for understanding is the key factor in the Monitoring and Adjusting process

CHARACTERISTICS OF EFFECTIVE QUESTIONS

Questions which may be answered by a YES or NO should not be asked

Questions should have a specific purpose and be relevant to the subject

Questions should be stated as briefly as possible, and in the language of the learner

Questions should be restricted to one main thought, and not linked to other questions

Questions should be addressed to the entire group in order to obtain the maximum amount of active participation. If it is desired that a specific person answer, name the person after the question has been stated

Questions should be directed at the group randomly with an even distribution, and no particular order

Questions should not be used to antagonize the learner(s)

Questions should always be "answerable"

ASK QUESTIONS USING PLEASANT FEELING TONE

ALLOW THE LEARNER TO RESPOND WITHOUT INTERUPTION

ALLOW PROCESSING TIME FOR THE LEARNER BEFORE REQUESTING AN ANSWER

HANDLING QUESTIONS

* Some you will answer immediately.

* Some you won't answer at all.

* In answering questions you should be certain that you reply the question that was stated.

* Don't evade the question.

* If the question is not clear to you, ask to have it repeated or ask for some additional information.

* In a small group, everyone will probably hear the question. If the question is not heard by everyone, repeat it.

* The reverse question technique can be used if you want to get the individual or group to do some thinking.

* You may be asked a question you can't answer. Simply state that you don't know. You can offer to find out and let the person know. There's nothing wrong with admitting that you don't know or calling on someone else.

* If it is a question that will be answered later in the session, tell the group this.

* If it is an irrelevant question or one you shouldn't answer, simply state that it is something which does not pertain to the current subject.

DEFINITIONS OF FACTORS

TOPIC: TEACH TO AN OBJECTIVE

FACTOR: Formulate an objective

- The ability of the teacher to identify the goals of the lesson

FACTOR: Relevant/Congruent Teacher Actions

- Actions selected by the teacher which are congruent to the learning objective and assist the learner in acquiring the new learning

- Teacher behaviors that promote the accomplishment of the intended goal

- Teacher actions that promote student behavior to reach a goal

MONITOR AND ADJUST

TEACHING BECOMES MORE PREDICTABLE WHEN THE TEACHER TAKES TIME TO MONITOR AND ADJUST.

MONITORING AND ADJUSTING IS ...

THE PROCESS FOR MONITORING IS ...

1.

2.

3.

4.

THE PROCESS FOR ADJUSTING IS ...

1.

2.

3.

4.

CRITICAL BEHAVIORS OF THE TEACHER

TEACH TO AN OBJECTIVE:

A. OBJECTIVE

1. _____

2. _____

B. BEHAVIORS OF THE TEACHER

1. _____

2. _____

3. _____

4. _____

TOPIC: MONITOR AND ADJUST

FACTOR: Monitor (Elicit and Check)

- Ongoing observation of student understanding of the lesson

- Process of eliciting feedback during instruction which enables the teacher to check student understanding

- Process where the teacher elicits an observable student response and checks for understanding to ensure incremental learning

- Teacher observations of student performance which indicate progress toward the objective

FACTOR: Adjust (Interpret and Act)

- Teacher ability to alter instruction based on student response

- A process of interpreting student response and acting on that interpretation

MOTIVATION - Goldenrod

ACTIVE PARTICIPATION - Blue

REINFORCEMENT - Buff

ANTICIPATORY SET - Green

CLOSURE - Pink

RETENTION - Tan

TRANSFER - Yellow

MOTIVATION

1. DEFINE MOTIVATION (WHAT IT MEANS TO BE MOTIVATED):

2. NAME FIVE VARIABLES OF MOTIVATION:

3. LIST CLASSROOM EXAMPLES OF MOTIVATION:

PRACTICE LABELING THE VARIABLES OF MOTIVATION

KEY: LC - Level of Concern I - Interest KR - Knowledge of Results
FT - Feeling Tone S - Success

Which variables of motivation is the teacher using?

_____ When modeling word problems on the board, the teacher uses the names of students in the class.

_____ In asking questions during a reading guide, the following information is given, "Now, this next one is going to be a little bit more difficult."

_____ A diagnostic test in a package is given in which the first two problems are so easy that the instructor knows every student can do them correctly.

_____ The teacher smiles warmly at the students at the beginning of a group's reading lesson.

_____ After completing a personal data form given by the teacher, student can do a leisure activity.

_____ The teacher sends home the students "good work" note for the parents to read.

_____ When reading a story to the class, the teacher uses the student names to depict the characters.

_____ In a small math group, the teacher has an answer sheet available on the bulletin board for students to check the answers to their worksheet.

_____ In primary, the reading groups are named Bullwinkle, Snoopy, the March Hare, and Mr. Toad.

_____ After an activity, an information sheet informs students what the answers are to the exercise and students are allowed to check their own papers.

_____ In an exercise on letter writing, the students are encouraged to write a letter to their favorite TV personality.

_____ During an assigned reading in social studies, the teacher says that in ten minutes each child will be required to write five new facts that s(he) learned.

_____ The teacher creates a center including Indian clothing, weaving, beads, and Indian pictures to initiate an Indian unit.

_____ The teacher gives a child who has difficulty in spelling five spelling words to master out of a twenty-word list.

_____ The teacher puts a note on a child's language paper stating that s(he) used capitalization and punctuation well.

_____ The teacher puts a hand on John's arm when he is eager to answer a question, but must wait for his turn.

EXAMPLES OF THE VARIABLES OF MOTIVATION

Level of Concern

* I'll check paper in five minutes
* Write answer on board
* Read a number and I'll call on you in five minutes
* Take out a pencil for a test
* Lower anxiety for spelling by giving short test more often
* Finished seat work will be passport to some desirable activity
* Take away a privilege if work not completed
* Announce you will test them
* Send to office
* Threaten to call mother
* "This paper will be signed by your parents"
* "I will check your paper"
* Test or quiz

Feeling Tone

* You follow directions so well
* Thank you for picking up the paper
* The boys are standing nicely today
* You were very polite when the phone rang
* Your desks are so neat
* Put names on board of good workers
* Body language (smile or frown from teacher)
* Giving praise and compliments
* Withholding praise or compliments
* Smiles, pats, physical reassurance
* Statements of teacher's displeasure
* Encouraging words
* Encouraging facial expression
* Pleasant voice
* Unpleasant voice
* Awareness and attention to individuals (greetings)

Interest

* Use raisins for math and eat the raisins
* Bring in objects of different colors to help focus on learning
* Putting a surprise message on a ditto
* Use another color chalk on board
* Use cartoon characters
* Colored chalk
* Audio visual aids
* Use students name in story problem
* Use anything that makes the learning vivid
* Room environment: exhibits, bulletin boards
* Manipulative materials
* Wide variety of activities and facts: e.g., centers, listening posts, film strips, plays
* Field trips

Success

* Adjust the level of difficulty
* Performance level
  a. Telling a child he has done a good job at things he tries
  b. Moving child into different reading level
* Gear quantity of work to right level
* Be aware of physical and health factors

Knowledge of Results

* Put specific comments on papers
* Verbalize to child his good points and how he can improve
* Have children notice good points of children in the class
* Child corrects own papers
* Make teacher comments on papers specific and helpful
* Immediate reinforcement through self-correction or immediate teacher check of papers (as work is in progress)

MOTIVATION

Educational Theory			Into	Educational Practice	
Topic	Definition	Factor		Technique	Example
Motivation	The ability of the learner to maintain focus on the task with an intent to learn	Feeling Tone		Pleasant	
				Unpleasant	
				Neutral	
		Level of Concern		Proximity	
				Visibility	
				Time	
				Materials	
		Interest		Relevant	
				Vivid	
				Novel	
		Success		Effort	
				Level of Difficulty	
		Knowledge of Results		Specific and immediate	

10 KEYS TO EFFECTIVE LISTENING

The 10 Keys	The Bad Listener	The Good Listener
1. Find areas of interest.	Tunes out dry subjects.	Is opportunistic; asks, "What's in it for me?"
2. Judge content, not delivery.	Tunes out if delivery is poor.	Judges content, skips over delivery errors.
3. Hold your fire.	Tends to enter into argument.	Doesn't judge until comprehension complete.
4. Listen for ideas.	Listens for facts.	Listens for central themes.
5. Be flexible.	Takes intensive notes, using only one system.	Takes fewer notes. Uses 4-5 different systems, depending on speaker.
6. Work at listening.	Shows no energy output; attention is faked.	Works hard; exhibits active body state.
7. Resist distractions.	Distracted easily.	Fights or avoids distractions, knows how to concentrate.
8. Exercise your mind.	Resists difficult expository material; seeks light, recreational material.	Uses heavier material as exercise for the mind.
9. Keep your mind open.	Reacts to emotional words.	Interprets color words; does not get hung up on them.
10. Capitalize on fact that thought is faster than speech.	Tends to daydream with slow speakers.	Challenges, anticipates, mentally summarizes, weighs the evidence, listens between the lines to tone of voice.

INDICATORS OF ENTHUSIASM

Personal Qualities	Performance Degrees		
1. Delivery	Poor variation in speech, monitone	Variation of tone, volume & speed, good articulation	Variations of tone & volume from whispers to excite, projections
2. Eyes	Lack of eye contact, no contact with individuals or audience	Appeared interested, occasionally lighting up, shining, opening wide	Eye contact & facial expression syncronized to show numerous feelings
3. Gestures	Never or seldom uses body, head & arms; often in a stationary position	Occasionally use of body, head and arms	Emphatic movement of body, head & arms to illustrate an idea
4. Body messages	Never or seldom moves from one spot. Positively on one location.	Moves freely in a variety of different directions	Designed and energetic body movements. change of pace frequent

INDICATORS OF ENTHUSIASM (CONT.)

Personal Qualities	Performance Degrees		
5. Facial expression	Expressionless, few smile lines, reserved	Expression fits situation; agreeable, sad, happy, etc.	Vibrant, broad smiles show many expressions
6. Word selection	Trite expressions, mostly nouns	Some adjectives used	Creatively descriptive, numerous adjectives, great variety
7. Ideas and feelings or ideas	Ignore feelings or ideas	Accepted ideas & feelings, some variation in response	Vigorous acceptance of feelings, great variation in response
8. Energy level	Lethgaric, dull, tired	Maintained even level, occasionally shows energetic spirit	Exuberant, gets energy from involvement and ideas, vitality plus

TOPIC: MOTIVATION

FACTOR: Feeling Tone

- Learner perceives classroom atmosphere and interaction
- Climate of the classroom as perceived by each student over a period of time
- Student's emotional response to the learning environment
- Attitude of the learner toward the learning environment

FACTOR: Level of Concern

- Tension or anxiety just beyond the comfort level of the learner
- Level of tension just above where the learner is comfortable
- Appropriate amount of tension felt by the learner

FACTOR: Interest

- Learner's awareness of the importance of the learning to themselves
- Attraction, within the student, to the learning
- Learner involvement in or curiosity about the lesson
- Learner perceives that the material to be learned is appealing

FACTOR: Success

- Learner senses accomplishment in reaching the intended objective

- Based on efforts, learner feels accomplishment

- Learner perceives that the learning was accomplished at an appropriate level

FACTOR: Knowledge of Results

- Learner has an immediate awareness of the quality and degree of the performance of the learning

- (Feedback) information whereby the student can gauge what has been learned

- Learner has an awareness of the accuracy and quality of responses based on feedback

ACTIVE PARTICIPATION

1. WHAT IS THE DEFINITION OF ACTIVE PARTICIPATION?

2. WHAT IS COVERT BEHAVIOR?

3. WHAT IS OVERT BEHAVIOR?

4. WRITE TWO TEACHER STATEMENTS THAT WOULD GENERATE COVERT BEHAVIOR.

5. WRITE TWO TEACHER STATEMENTS THAT WOULD GENERATE OVERT BEHAVIOR.

6. WRITE A TEACHER STATEMENT THAT WILL GENERATE OVERT BEHAVIOR FROM ONE STUDENT AND COVERT BEHAVIOR FROM THE REST OF THE GROUP.

7. WRITE A TEACHER STATEMENT THAT WILL GENERATE COVERT BEHAVIOR FROM ONE STUDENT AND OVERT BEHAVIOR FROM THE REST OF THE GROUP.

8. WRITE A TEACHER STATEMENT THAT WILL GENERATE COVERT BEHAVIOR FROM ALL STUDENTS AND THEN OVERT BEHAVIOR FROM ALL STUDENTS.

9. WHAT ARE SOME EXAMPLES OF ABUSING THE PRINCIPLE OF ACTIVE PARTICIPATION?

Suggestions for Increasing Student Participation

Small Group Activities

1. *Discuss with a Partner*
   Examples:
   In your own words, explain to your partner how the pistons in a car engine work.
   Share with your partner the guidelines to keep in mind when writing an expository paragraph.
   Discuss with your partner the meanings of these ten terms from our anatomy unit.
2. *Discussion in Small Groups*
   Keep the group size to four or five so that each student can participate. Appoint a recorder to summarize the findings of the discussion.
3. *Write Questions*
   Examples:
   Write one question about what we have just been studying. Try it out on a person near you. If he can't answer the question, pass it to me. At the end of the period, I'll answer all questions that have been turned in.
   Write two questions based on the topic, "Planning Nutritional Meals." We'll use them tomorrow for a review of the unit.
4. *Brainstorm*
   Brainstorming can be done as a group or with a partner. Define the topic or problem. For example, the topic may be questions students think will be covered on an exam.
   Examples:
   On your scratch paper, jot down as many terms as you can think of that are related to the topic we began studying yesterday. In five minutes we'll discuss these terms.
   Repeat the same process as in the previous example, but share the ideas with a partner.
5. *Debate*
   Discussion and examination of both sides of a question involves more students when done in small groups. In teaching debate techniques, first explain the structure. Then, with the help of a student, demonstrate a debate for the group. This gives students the guidelines of debating.
6. *Peer Group Teaching*
   Using students as tutors is an effective learning device for both the tutor and tutored.
7. *Role Playing*
   Simulating an event brings new perspectives to any lesson. Role playing involves more students when done in small groups, as it reduces the risk factor.

Whole-Group Activities

8. *Oral Reading*
   Oral reading can be done in two ways.
   a. One student can read while the rest of the class follows with markers, their eyes, or their fingers.
   b. The entire class can read aloud together. For special dramatic effects, the boys and girls can alternate reading, etc.
9. *Whisper Answer in Teacher's Ear*
   The teacher can select random students to whisper the answer to him/her.
10. *Provide Wait Time for Covert Rehearsal of Responses*
    Waiting at least 3 seconds for an answer is a critical element in effective questioning of an entire class. Ask the students who have arrived at an idea to do

something overt, such as put their right hand on the table, fold their arms, etc. Promote even greater participation by telling the class how many have given the signal. For example, say, "Well, already 12 people have signaled that they know the answer." Wait until a sufficient response number is obtained. Then call on one randomly selected student to answer the question.

Examples:

Which were the three Axis countries during World War II? (Pause) I can tell you're thinking. I see five hands, six, eight, lots more. Let's see, I think I'll call on Ted.

I want you to think about whether this blueprint would be practical for a house in an area that has a climate like Southern California's. I'll call upon someone in about one minute.

11. *Unison Response*

A teacher signal will indicate when the class should respond. For example, the slow raising of the teacher's hand means preparation. The abrupt lowering signals the point for the class response.

Examples

I'll point to a word and say a definition. If the definition I give is correct, please reply all together, "Yes." If it's incorrect, all say, "No."

I'll read some statements about the digestive process. If the statement is true, everyone respond together, "True," etc.

We'll check the answers to this worksheet together. I'll say the number of the question, then all of you respond with the answer on your paper. If the response is clear, we won't need to discuss that question. If it's garbled, we'll stop to clarify. (This obviously will work ony with short answer responses.)

12. *Consecutive Response*

Each student is responsible for recalling the previous student's response.

13. *Polling by Raised Hands*

Casting votes or canvassing for information can be registered on a chart visible to the entire class.

14. *Pointing*

Using an individual pictorial representation (map, diagram, picture), the students can point to the correct answer.

15. *Cross/Uncross Arms*

Examples:

I'll read a series of statements about different kinds of angles. If you agree with the statement, cross your arms; if you don't agree, don't cross your arms.

If you agree with Toby's opinion, cross your arms, etc.

16. *Flash Answers in Groups*

Flash cards made by students can be used in a variety of ways: true/false cards (color coded for ease of reading); numerical multiplication table answers; vocabulary review; and color coded classifying.

Examples:

We've talked about the three branches of our federal government. They're divided into groups, and each group has three cards, each one stating a different governmental branch. I'll read a governmental duty (such as making laws). As a group decide which branch of government would be responsible for that duty, and then hold up the correct card.

There are three animal classifications listed on the board, and they are color coded. Each group has three pieces of paper, each a different color. I'll read the name of an animal, and as a group you decide which category that animal belongs to. Then, hold up the appropriate piece of paper.

17. *Flashers*

A short answer can be written either on a laminated notebook with a water soluble pen or on an individual chalkboard.

18. *Thumb Signals (Done at chest level in a personal, low-key manner)*

Examples:

I'll read several statements about how to make a collar for a blouse. If the state-

ment is true, put your thumb up. If it is false, put your thumb down. If you're not sure, put your thumb to the side.
If you agree with Jim's explanation of a zone defense, put your thumb up, etc.

19 *Finger Signals (Done at chest level in a personal, low-key manner)*
Examples:
The three kinds of rock formations are listed on the board by number. I'll say a characteristic of a certain rock formation; you put up the appropriate number of fingers for the one that is being described.
The five main characters from the novel are listed on the board by number, etc.
I'll play several chords on the piano. If it's a major chord, put up one finger; if it's a minor chord, put up two fingers.

20. *Flash Cards*
Examples:
You've made flash cards for your new Spanish vocabulary. Study them alone for five minutes. Then we'll do some "spot checking."
You've made flash cards for this week's vocabulary words. Practice them with a partner for ten minutes. Then we'll have our quiz.

21. *Cross/Uncross Arms or Legs, Look Up or Down, Thumbs Up or Down, Pencils Up or Down*
The opposite positions can indicate positive/negative, higher/lower, or any two-part test of opposites.

This list was derived from the ideas of Pam Robbins and Pat Wolfe of the Napa County Office of Education, Napa, California; and Priscilla Logan, Santa Fe Public Schools, Santa Fe, New Mexico.

Covert:

1. Visualize how the pistons in a car engine work.
2. Compute in your head the answer to 5 x 50.
3. Pretend you're a character in a book. How would you feel and what would you do?
4. Remember a holiday that stands out in your mind.
5. Picture yourself using the proper technique for a correct golf swing.
6. Think about all the things you have that are assets; that are liabilities.
7. Look for errors in capitalization in the sentences that are on the board.
8. Think about all the ways you could use burlap to decorate.
9. Follow along while the teacher reads the instructions.
10. Watch the technique I use in executing this dance step.
11. Say to yourself the 5 levels of the deciduous forest.
12. Suppose you're in a boat out on the lake and the only pair of oars you have falls overboard.
13. Create mental pictures of the donkeys walking along the Grand Canyon in the Grand Canyon Suite.
14. Close your eyes and smell a freshly-mowed lawn.
15. Guess what I have in this paper bag.

Overt:

1. Watch what I do and repeat it back to me.
2. Students show a flashcard with "s" on one side and "es" on the other to show the correct plural ending of a word given by the teacher.
3. Use a chaining activity where one student says Sunday, the next Monday, etc. as indicated by the teacher. (Be sure to call on students randomly)
4. Use role playing to simulate an event either individually or in small groups (Small group reduces risk factor).
5. Thumbs up, thumbs down, or out to side to indicate yes, no, and I don't know.
6. Discuss with your neighbor before I call on someone to answer.
7. While some students respond at the chalkboard, others are writing answers on paper at seats.
8. Point to the half notes in this piece of music.
9. Complete a worksheet.
10. Teach or help someone else with a particular classroom assignment.
11. "Everyone get up and find something in the classroom that's red (wood, glass, plastic, etc.)."
12. Have students recite answers either as a group or individually (chosen randomly).
13. Using your finger in the air, write the answer to 7 + 5.
14. "Take the following dictation."
15. Compute the answer and check it on the calculator.

ACTIVE PARTICIPATION

Educational Theory			Into	Educational Practice	
Topic	Definition	Factor		Technique	Example
Active Participation	The ability of the learner to be consistently engaged in that which is to be learned	Overt/ Covert		All Covert	
				All Overt	
				One Overt, Others Covert	
				One Covert, Others Overt	
				Some Overt, Others Covert,	
				Some Covert, Others Overt	

TOPIC: ACTIVE PARTICIPATION

FACTOR: Overt

- Visible or observable behavior of the learner

- Learners demonstrate engagement of their minds on the learning in an observable way

- Observable student behaviors that are relevant to the learning

FACTOR: Covert

- Invisible or unobservable behavior of the learner

- Unobservable behaviors that are relevant to the learning

REINFORCEMENT

1. DEFINE REINFORCEMENT:

2. NAME THE THREE KINDS OF REINFORCERS:

   A. _____

   _____

   B. _____

   _____

   C. _____

   _____

3. LIST THREE FORMS OF REINFORCERS:

   A. _____

   B. _____

   C. _____

REINFORCEMENT

1. WHAT IS POSITIVE REINFORCEMENT?

2. WHAT IS NEGATIVE REINFORCEMENT?

3. WHAT ARE SOME FACTORS TO CONSIDER WHEN USING NEGATIVE REINFORCEMENT?

4. WHAT IS EXTINCTION?

"HOW TO CHANGE BEHAVIOR" RECIPE

STEP 1: IDENTIFY (FIRST FOR YOURSELF AND THEN WITH THE STUDENT) THE BEHAVIOR TO BE CHANGED AND THE NEW BEHAVIOR THAT IS TO REPLACE THE OLD.

STEP 2: DECIDE WHAT CONSTITUTES POSITIVE AND NEGATIVE REINFORCEMENT. DEVISE A STRATEGY TO GET THE NEW BEHAVIOR AND DETERMINE THE WAY YOU WILL POSITIVELY REINFORCE IT.

STEP 3: DECIDE WHETHER THE OLD BEHAVIOR IS SO STRONG YOU NEED TO SUPPRESS WITH NEGATIVE REINFORCEMENT OR WHETHER LACK OF ANY KIND OF REINFORCEMENT WILL EXTINGUISH IT. IF YOU DECIDE TO USE NEGATIVE REINFORCEMENT, DETERMINE WHAT IT WILL BE. REMEMBER, THE STUDENT'S BEHAVIOR THAT REMOVES YOUR NEGATIVE REINFORCER, IS BEING STRENGTHENED, SO BE CAREFUL!

STEP 4: DEVELOP A STRATEGY TO GET THE STUDENT TO PRACTICE THE NEW BEHAVIOR AND POSITIVELY REINFORCE IT ON A REGULAR SCHEDULE (EVERY TIME).

STEP 5: As soon as the student has practiced the new behavior enough so it is more likely than the old behavior, remove any negative reinforcement so the old behavior can occur with no reinforcement and be extinguished.

STEP 6: Change to an intermittent schedule of reinforcing the new behavior (make the intervals between reinforcement increasingly long) so the new behavior will be resistant to forgetting.

STEP 7: Know that occasionally the student will slip back into his old behavior (spontaneous recovery) but now you know how to achieve the new behavior. How?

Examples of Reinforcement

Positive

When a student studying English grammar uses the correct tense of "have" in a sentence needing a helping verb, the teacher might say, "I see you're using the correct tense of 'have' before the verb. Good for you! You really understand tenses."

A sign thanking students for keeping their lab areas clean.

Upon receiving a paper from a student who usually forgets to write his/her name, the teacher might say, "You remembered to put your name on your paper so I'd know whose good work it was."

Negative

If a child has not finished a spelling assignment, he/she isn't permitted to go to lunch until the work is completed. The delay in eating and the loss of time to be with friends may both be negative reinforcers.

A student who disrupts could lose a free time period or the opportunity to participate in a game.

A student who is habitually late to class is not allowed to enter when late without a note from the principal or parent.

Extinction

When a teacher is taking roll at the beginning of a new semester and a student answers with a smart remark, the teacher may go right on taking roll as if the student said nothing. Having caused no reaction from the teacher, the student may decide not to bother the next time.

When a student choses to belch in a boisterous fashion, the teacher could ignore the action and go on.

SCHEDULE OF REINFORCEMENT

1. Teachers should start with behaviors that are easy to change.

2. Teachers should focus on only one behavior at a time in order to maintain a regular schedule of reinforcement.

3. When a new behavior is being learned, it is essential that the teacher be consistent with reinforcers.

4. A regular schedule of reinforcement, where the desirable behavior is reinforced every time it appears, results in rapid learning.

5. An intermittent schedule of reinforcement, where behavior is reinforced one time and then not reinforced the next time and the intervals between reinforcers become longer and longer, develops a very durable behavior that is long remembered.

NEGATIVE REINFORCEMENT OR PUNISHMENT?

Madeline Hunter

Did the teacher punish or was the behavior negatively reinforced?

Confusion surrounds these two useful concepts in teaching methodology: negative reinforcement and punishment. While the confusion scandalizes the "psychological purist" and is looked on as of no consequence by the busy teacher, it certainly will not hurt to clear up the difference and it may even help.

One might ask, "Why don't we just look in any book in beginning psychology to find the answer?" Unfortunately that won't work. There are several reasons: (1) The vocabulary used is not that of the classroom. The differences between negative reinforcement and punishment are described in terms of noxious stimuli and avoidance behaviors, primarily with animal studies which are not readily translated into teacher and student behaviors, (2) While differences may seem clear in the textbook, they become increasingly fuzzy when removed from the sterility of the laboratory. To teach a discriminator, examples must be similar in every aspect except the critical attribute which determines what something is; i.e., which is negative reinforcement and which is punishment.

This article will attempt to clarify the confusion. If, to the expert, concepts seem to be over-simplified, it is the result of attempting to present a concept initially in the most obvious, simple and unambiguous terms.

There are a few generalizations which are central to the understanding of reinforcement theory.

(1) Reinforce means "to strengthen." We reinforce a behavior to make it stronger, which means to increase the probability or the frequency of that behavior. "Stronger" in the behavioral sense means that the reinforced behavior is more apt to occur than some other behavior or that the reinforced behavior occurs more frequently than it did in the past.

"For him, intelligent decision making is stronger than is tossing a coin," means that intelligent decision making is a more likely or a more frequent behavior than is coin tossing. It does not mean that intelligent decision making always occurs or that coin tossing never occurs. Another analogy might be, "Bill is the stronger player." This does not mean that Bill always wins over another player, but if you're betting money, your best bet is Bill.

(2) Positive reinforcement means that something has been added (+) immediately after a behavior occurs. If that "something" is needed, pleasant or desired by the person, it is highly probable the behavior will be strengthened. Johnny says, "Please, may I?" Mother says "Of course you may, you asked so politely." Johnny's polite asking will become more probable or more frequent. If Johnny whines and fusses to get his way and mother says, "yes," whining and fussing will become a more probable or frequent response. Whichever behavior (asking politely or fussing) is followed by getting what he wants will be the behavior that is strengthened.

We could diagram reinforcement as follows:

Behavior _____ + reinforcement _____

(becomes stronger)

(3) When we say a behavior is "weakened," we mean that behavior has become less probable or less frequent. When a teacher says, "You get the next turn because you raised your hand." she is attempting to increase the probability or frequency of hand raising and decrease the probability or frequency of calling out answers or sitting without participating. Notice reinforcement merely changed the order of probability of the three responses:

Raising hand_____ + Reinforcer _____

Calling out_____

Sitting without participating_____

All three behaviors started out at the same strength. When hand raising was reinforced, it became stronger (more probable). Although the other two behaviors may remain at the same strength, in comparison, they now are weaker in probability than is hand raising. Reinforcement changes the order of probability (strength) of behaviors.

Let's look at another example. Bert usually whines to get what he wants, Whining is more probable than asking "please, may I?" Mother has decided she wants to strengthen the more desirable asking. So, whenever he says "please, may I?" she gives him (adds) what he wants. As a result asking becomes more probable than whining. Asking has been positively reinforced (strengthened). Knowing how to use a schedule of reinforcement will enable mother to keep his asking behavior stronger without giving him whatever he wants for the rest of his life.

(3) Negative (-) reinforcement means that something has been subtracted or taken away. The removal (subtraction rather than addition) has reinforced (strengthened) the behavior which the removal (of something undesired) immediately followed. Example: you get in your car and

start the motor with an unfastened seat belt. An unpleasant bussing occurs. You fasten the belt. The buzzing stops. Fastening the belt has been negatively reinforced (strengthened) because it removed (subtracted) an unpleasant noise. Note that the buzzing and behavior (not fastening seat belt) were occurring simultaneously. A change of behavior (fastening the seat belt) cut off (subtracted) the buzzing and the new behavior was strengthened (negatively reinforced). The negative reinforcer was the removal of the buzzing sound.

All reinforcers are defined by their consequences. Positive reinforcement means strengthening of the behavior that brought on the positive reinforcer. Asking "please" brought on (added) the desired permission and the response became more probable. Negative reinforcement means strengthening of the behavior that removed (subtracted) the negative stimulus. Fastening the seat belt removed the buzzing and fastening became more probable. Note that car manufacturers, not understanding reinforcement theory, have made the noise pleasant (chimes) and have turned off the noise automatically after a short period, thereby reinforcing ignoring the noise or "waiting it out" which removes the noise. As a result, for many people, both of those behaviors have become more probable than fastening the belt.

Negative reinforcement could be diagrammed as follows:

Example 1: Not fastening seat belt_____ behavior changed

Buzzing_____ Buzzing stopped

Fastening seat belt

Not fastening the seat belt and the buzzing occurred simultaneously. Because fastening the seat belt removed (cut off) the buzzing, that behavior became stronger (was negatively reinforced).

Example II: Not fastening seat belt and waiting_____

Buzzing_____ (Automatic stop).

Because the buzzer stopped while the driver was doing nothing but waiting, "waiting it out" was strengthened," becasue it got rid of (removed) the noise.

Let's look at a classroom example. Two girls are giggling and whispering. The teacher stops teaching and glares at the girls. The behaviors of girls giggling and teacher glaring are occurring simultaneously. The girls stop giggling and start listening (new behavior) which removes the teacher's glare, so listening is strengthened. Remember that reinforcers are defined by their results. If the listening behavior does not become more probable, negative reinforcement has not occurred regardless of how much glaring the teacher does.

Negative reinforcement is important because when the student changes behavior (fastening seat belts, stopping giggling), (s)he can remove the negative reinforcers. Negative reinforcement is dangerous because any behavior which removes the undesired stimulus (disconnecting buzzer, pretending to pay attention, lying, cheating, blaming others) will be strengthened.

4) Punishment is the addition (+) of undesirable consequences in an attempt to suppress a behavior. In Canada, you get a ticket (punishment) if you drive without a seat belt. The teacher may say to the giggley girls, "You will stay after school." In the case of punishment, the person is not able to remove this unpleasant stimulus by changing behavior at this point. Only the police officer or the teacher can remove the consequences.

But, and here is where negative reinforcement and punishment become fuzzy, in the future, the memory trace of the threat of the punishment can become a negative reinforcer. To remove the chance of getting a ticket, the motorist may fasten the belt and experience the negative reinforcement of relief from worry about a ticket. The girls may want to giggle and talk, but they can remove the unpleasant possiblity of staying after school by listening to the teacher, so listening has been negatively reinforced. Now, if the teacher understands reinforcement theory, (s)he will add a positive reinforcer to the listening behavior: "You girls are listening so carefully, you will know this so well you won't have to study for the test," thereby increasing through positive reinforcement the probability of listening behavior in the future.

To Summarize:

Reinforcement means to "strengthen" a behavior: make it more probable or more frequent.

Positive reinforcement means to strengthen a behavior by addition of something needed or desired immediately after the behavior occurs. The presence of something desirable acts as a reinforcer.

Negative reinforcement means to strengthen a behavior by subtraction of something undesirable immediately after that behavior has occurred. The absence of something undesirable acts as a reinforcer.

Punishment means the addition of an undesirable consequence in order to suppress a behavior. The memory or threat of a punishment can subsequently become a negative reinforcer.

If, in spite of the author's efforts, the distinctions are not completely clear, don't worry about it. Lots of people who don't understand electricity use it very effectively. The author has watched many teachers use reinforcement theory so it was a symphony of theory into artistic performance. Those teachers' explanations of what they were doing might be incorrect or a garbled mess which no one could understand. Conversely, some psychologists can articulate theory with precision but don't use it effectively to increase productive learning in their own university classes.

So, if you can't clearly describe the difference between negative reinforcement and punishment, don't worry. Just use both with artistry and with dignity to your students.

TOPIC: REINFORCEMENT

FACTOR: Positive Response

- A response that the learner needs or desires

- Something interpreted by the learner that increases desired behavior

- What the learner needs, wants or desires

FACTOR: Negative Response

- A response that is unpleasant or not desired by the learner

- Something interpreted by the learner that decreases undesired behavior

- What the learner does not need, want or desire

FACTOR: Extinction

- Occurs when the learner is provided with no respons

- Diminishing of student behavior due to lack of a response

DIRECTIONS: FILL IN THE BLANKS IN THE FOLLOWING PARAGRAPH. SOME OF THE WORDS WILL HAVE THE FIRST LETTER PROVIDED, AND YOU SHOULD FILL IN THE REST.

ANYONE INTERESTED IN IE_____ IS CONCERNED ABOUT C_____. IT'S HARD TO IMAGINE IE_____ SCH_____ WITHOUT THEM. ALTHOUGH THEY CAN SOMETIMES BE BOTHERSOME, WE I_____ THEM. WHEN THINGS GO WRONG, WE SOMETIMES BLAME THE P_____, INSTEAD OF ACCEPTING RESPONSIBILITY FOR THE CONSEQUENCES OURSELVES.

ANTICIPATORY SET

DIRECTIONS: PLEASE PUT YOUR NOTES AWAY. PROCEED TO ANSWER THESE QUESTIONS.

1. LIST THREE FACTORS OF SET.
   A.
   B.
   C.

2. LIST THREE TIMES IN A LESSON WHEN SET MIGHT BE USED.
   A.
   B.
   C.

3. EXPLAIN IN YOUR OWN WORDS WHY WE USE SET.

RETENTION THEORY

Identify the variables of retention. Next to each variable, write the generalization for each.

1.

2.

3.

4.

5.

6.

7.

List the generalizations a teacher should consider when providing practice for learners.

List the ways teachers can give meaning to a learning.

List the attributes of effective modeling.

PRACTICE

1. How much?

2. How long?

3. How often?

4. How well?

RETENTION

Educational Theory			Into	Educational Practice	
Topic	Definition	Factor		Technique	Example
Retention	The ability of the learner to remember or recall events relevant to the objective	Meaning		Relevant to the Learners	
				Structure the Task	
				Use Mnemonic Devices	
		Modeling		Product	
				Performance	
		Degree of Original Learning			
		Feeling Tone		Pleasant	
				Unpleasant	
				Neutral	
		Practice		Amount (how much)	
				Time (how long)	
				Frequency (how often)	
				Monitoring (how well)	

Mnemonic Devices

1. Great Lakes
   - H uron
   - O ntario
   - M ichigan
   - E rie
   - S uperior

2. Planets

M y	Mercury
V ery	Venus
E lderly	Earth
M other	Mars
J ust	Jupiter
S ent	Saturn
U s	Uranus
N inety	Neptune
P izzas	Pluto

3. Arithmetic
   - A
   - R at
   - I n
   - T he
   - H ouse
   - M ay
   - E at
   - T he
   - I ce
   - C ream

4. Rhythm
   - R un
   - H ome
   - Y ou
   - T ired
   - H ouse
   - M ates

5.

Kingdom	K ings	K ind
Phylum	P lace	P eople
Class	C ats	C ome
Order	O ver	O ver
Family	F ire	F rom
Genus	G oing	G ermany
Species	S outh	S ometimes

6. Division of Fractions

   "Ours is not to question why, just invert and multiply."

7. Spelling of *their, there, they're:*

   a. All have <u>the</u> in them.
   b. *Here* and *there* are both <u>places</u>.
      There has *here* in it.
   c. *I* and *their* both refer to people. *I* is in *their*.

8. Colors of the Spectrum
   - R ed
   - O range
   - Y ellow
   - G reen
   - B lue
   - I ndigo
   - V iolet

9. Stationary - *a* as in stay
   Stationery - *e* as in letter

TOPIC: RETENTION

FACTOR: Meaning

- Student ability to integrate the learning into a base of knowledge
- Relationship of the learning to the student's own knowledge and past experience
- Relevancy of the learning as viewed by the learner
- Learning is important to the learner at a personal level

FACTOR: Modeling

- Learner receives concrete representation of the learning
- Sensory representations of the critical attributes of the learning as perceived by the learner

FACTOR: Practice

- Opportunity for the learner to have repeated experiences with the new learning
- Repeated experiences of the learning over time
- Scheduled repetitions of the learning

FACTOR: Feeling Tone (see Motivation)

FACTOR: Degree of Original Learning

- Mastery of the initial learning
- How well the student learned the first time

RETENTION SELF-TEST

1. IF YOU WISH LEARNERS TO REMEMBER THAT A MAP IS A SCHEMATIC REPRESENTATION OF THE WORLD, YOU PROBABLY WOULD HAVE HIM/HER BEGIN BY WORKING ON A MAP OF ... .

   A. HIS/HER TOWN.
   B. THE UNITED STATES.
   C. HIS/HER SCHOOL.
   D. A FOREIGN COUNTRY.

2. WHICH STATEMENT SHOULD YOU MOST EASILY REMEMBER?

   A. B + D = M
   B. A TEACHER CAN DELIBERATELY PLAN LESSONS SO THEY ARE BETTER REMEMBERED.
   C. THE LATEST RESEARCH INDICATES THAT FORGETTING IS INVERSELY CORRELATED WITH MEANING.
   D. EBBINGHAUS EXPERIMENTED WITH MEMORY IN THE LAST CENTURY.

3. SO CHILDREN REMEMBER WHAT THE PLEDGE OF ALLEGIANCE MEANS, YOU WOULD HAVE THEM ...

   A. SAY IT EVERY MORNING.
   B. USE A DICTIONARY TO LOOK UP DEFINITION OF KEY WORDS IN THE PLEDGE.
   C. MEMORIZE THE DEFINITION OF KEY WORDS IN THE PLEDGE.
   D. REWRITE THE PLEDGE USING THEIR OWN WORDS TO MAINTAIN ITS GENERAL MEANING.
   E. STUDY THE LIVES OF AMERICAN HEROES.

4. IF YOU WERE PLANNING THE MOST EFFICIENT WAY FOR YOUR STUDENTS TO REMEMBER THAT 8 x 7 = 56, YOU WOULD:

A. PRACTICE IT ONCE EVERY DAY.
B. PRACTICE ON ONE DAY FOR A HALF HOUR
C. PRACTICE IT WHENEVER IT WAS NEEDED IN A PROBLEM
D. CONCENTRATE ON IT UNTIL EVERYONE KNEW IT AND THEN SPEND NO MORE TIME ON IT.
E. PRACTICE IT AT CLOSELY SPACED INTERVALS, AND AFTER IT WAS LEARNED, GRADUALLY INCREASE THE INTERVALS BETWEEN PRACTICE PERIODS ON SUBSEQUENT DAYS

5. STUDENTS DILIGENTLY WORKED ON THE MULTIPLICATION FACTS UNTIL BY CHRISTMAS EVERYONE KNEW THEM PERFECTLY. THEY THEN USED THE TIME TO WORK ON OTHER THINGS. JUST BEFORE EASTER VACATION A REVIEW TEST REVEALED STUDENTS HAD FORGOTTEN MANY FACTS. THIS WAS PROBABLY BECAUSE:

A. LACK OF ADEQUATE DEGREE OF LEARNING
B. LACK OF FEELING TONE
C. LACK OF MEANING
D. LACK OF POSITIVE TRANSFER.
E. LACK OF DISTRIBUTED PRACTICE

6. TO INCREASE RETENTION A TEACHER SHOULD BE SURE TO:

A. COVER THE MATERIAL INCLUDED IN A COURSE
B. SPEND EXTRA TIME ON THE IMPORTANT PARTS
C. MAKE SURE THAT WHAT IS TAUGHT IS THOROUGHLY LEARNED BEFORE MOVING ON
D. GIVE PLENTY OF DRILL
E. GIVE MANY TESTS

7. IF ALL OF THE FOLLOWING WERE EQUALLY WELL LEARNED WHICH WOULD PROBABLY BE BEST REMEMBERED?

A. ALL REPTILES ARE COLD BLOODED
B. SOME SNAKES ARE TEN FEET LONG
C. A RATTLESNAKE HAS A DIAMOND PATTERN
D. RATTLESNAKES ARE FOUND IN CERTAIN STATES
E. SOME SNAKES LIKE MILK

8. ADULTS KNOW LITTLE ABOUT THE PARTS OF SPEECH ALTHOUGH MOST STUDIED THEM IN SCHOOL. THIS IS PROBABLY BECAUSE:

A. THEY DIDN'T HAVE ENOUGH PRACTICE
B. THEIR LEARNING WAS CONNECTED WITH UNPLEASANT FEELING TONES.
C. THE PARTS OF SPEECH HAD LITTLE REAL MEANING
D. SUBSEQUENT LEARNING HAS INTERFERED WITH THE MEMORY
E. THEIR ORIGINAL LEARNING WAS INADEQUATE

9. IF YOU CANNOT REMEMBER WHAT YOU HAD FOR DINNER A WEEK AGO LAST THURSDAY, IT IS PROBABLY DUE TO:

A. NEGATIVE TRANSFER
B. NEGATIVE FEELING TONES
C. POSITIVE TRANSFER
D. POSITIVE FEELING TONES
E. NEUTRAL FEELING TONES

10. WELL DESIGNED TESTS ARE VALUABLE IN PROMOTING RETENTION BECAUSE THEY:

A. IDENTIFY WHAT HAS BEEN WELL LEARNED
B. IDENTIFY WHAT HAS NOT BEEN LEARNED
C. ALERT THE TEACHER TO HOW STUDENTS' LEARNING IS PROGRESSING
D. CAUSE THE STUDENTS TO PRACTICE REMEMBERING
E. ARE BASED ON IMPORTANT GENERALIZATIONS

11. WHEN NEW TEACHERS DO NOT KNOW WHAT TO DO IN A LEARNING SITUATION, THEY USUALLY REVERT BACK TO WHAT THEIR TEACHER DID WHEN THEY WERE STUDENTS, RATHER THAN REMEMBERING AND USING THE THEORY THEY LEARNED IN COLLEGE OR IN-SERVICE COURSES. THIS IS PROBABLY DUE TO:

A. LACK OF MEANING IN THOSE COURSES
B. LACK OF APPROPRIATE PRACTICE WITH THE THEORY
C. NEGATIVE TRANSFER FROM THEIR PAST SCHOOLING
D. INADEQUATE LEARNING FROM THE COURSES
E. BOREDOM OR NEUTRAL FEELING TONES

Right-Brained Kids in Left-Brained Schools

Madeline Hunter

"Why should I read the directions? I can see how it goes together!" This obviously correct statement has baffled many a teacher as a student confidently confronted a bewildering array of pieces. And (s)he could "see" how it went together while his/her seemingly more able classmates struggled through decoding "attach narrow end of part A to rounded side of part B," in order to ferret out the knowledge that would guide their actions.

That same puzzling student would protest, "Don't tell me how to get there, draw me a map," while his/her bewildered teacher plead, "Don't show me a map, just tell me how to get there."

Teacher and student scratched their heads as each wondered how the other ever survived in this complex world. Each acknowledged the other seemed to have good sense, but "it's beyond me how (s)he thinks."

Such 'differentness" in thinking, ways of remembering ("I don't remember what (s)he said but I can describe the room we were in." vs. "I don't remember where it was but I can tell you what (s)he said."), ways of attacking problems ("Let's lay it out on paper."' vs. "Let's talk about it."), and styles of learning have been dealt with in the past by dumping those variations in the "people-are-different" basket. Now research in hemisphericity has begun to sort that basket into the categories of left- and right-brained thinking with promising and productive suggestions for teachers that could accelerate the learning outcomes of students.

Research in hemisphericity indicates that humans have two brains (hemispheres), each complete in itself. Unlike animals, man, at an early age, begins to differentiate the data processed by each of his brains. His left hemisphere "specializes" in data where significance is based in relationships that are built across time. You are using your left hemisphere as you relate what you are now reading to what you read in the previous paragraph and what you will read in the next paragraph. The left hemisphere has been called the temporal or propositional "if-then" brain because significance or relationships are perceived across time.

The right hemisphere in most humans "specializes" in data where significance emerges from relationships that must be perceived across space. You are using your right hemisphere when, from the surrounding visual environment, you are aware of where you are in the building, recognize a face, or understand diagrams or data displayed on a chart or graph. The right hemisphere has been called the visual-spacial or appositional brain.

The right and left hemispheres are connected by an impressive bundle of nerve fibers, the corpus callosum which transmits "messages" from one brain to the other to produce "integrated brain thinking." A somewhat similar analogy is that we have "assigned" certain responsibilities to our hands (holding the book with our left-hand while we point to the word or turn the page with our right-hand, cutting with our right-hand while we manipulate the material with the left). No matter how able we are with our right-hand, we do most things more efficiently and effectively if we also use our left-hand. In like manner, integrated brained thinking is the result of each hemisphere augmenting the information processed by the other.

Researchers suspect that individuals are born with a predisposition to prefer, or find it easier to use their right- or left-brain, however, as with handedness, practice has a great deal to do with skill. (Witness the right-handed pianist who plays beautifully with his/her left-hand, the typist who makes no more errors with his/her left than (s)he does with his/her right-hand, or the craftsman who needs both hands so uses them with almost equal dexterity.) Without practice, skills and processes can become stagnant so the comfort of using the dominant hand (or brain) often results in the subordinate hand (or brain) getting minimal use As a result, the ineptitude which results from lack of practice is often incorrectly interpreted as lack of inherent ability.

This seems to be true of "brainedness." Because a student can "see" how it goes together, (s)he uses his/her more facile right-brain and may not give his/her left-brain the practice of reading and following directions. Because other students can get their instructions more easily from reading, they don't practice "seeing" if they can figure it out. The assumption that native ability is extended or diminished by practice is supported by current research which indicates that measured I.Q. can change with prescribed changes in experience. In no way, however, should these statements be construed as indicating that all difference in human performance is the result of experience. We still can't make every learner equal.

Hemisphericity plays an important role in the selection of occupations and hobbies. The architect, design engineer, accountant, farmer, artist, musician, etc., must deal comfortably with visual-spacial data. The philosopher, theoretician, salesman ("If I do this, then (s)he'll buy that") must handle temporal data and

synthesize those data across time into an idea or understanding. Many people are facile with both hemispheres (the Leonardo da Vincis of the world), and everyone uses both brains to varying degrees unless, as the result of an accident or surgery, they have only one.

For years, the relationship of the left- and right-brain to learning was considered relevant only to the remedial education of medical cases. It was from study of the pathology related to damage to one brain, or the severing of the corpus callosum (commissurotomy), that much of what we now know of hemisphericity has emerged. (Should the reader be interested in the medical and neurological aspects of hemisphericity, references are listed at the end of this article.)

Recently, hemispheric implications have been the subject of scrutiny by educators who were looking for more efficient and effective ways of promoting learning and for ways of remediating the learning of those obviously able youngsters who were not "getting it." The results of that scrutiny are powerfully suggestive of the conclusion that schools have been beaming most of their instruction through a left-brained, temporal input (reading and listening) and output (talking and writing) system, thereby handicapping all learners. Those who learned well through left-brained input had minimal or haphazard practice in using their right-brain. Those students who learned easier with right-brained input have been handicapped by having to use primarily their left-brain without the "backup" of the same information processed by the more proficient right hemisphere, "backup" that could be transmitted across the corpus callosum to augment and assign additional significance to the right-brained input message, thereby integrating the power of the two hemispheres.

Educators and brain researchers are becoming suspicious that the boy who knew everything about a carburetor, but couldn't read the test on carburetion systems or write the answers that he had already demonstrated in action that he knew, or the girl who did well in algebra, but almost flunked geometry, were both victims of our lack of understanding of hemisphericity. We are beginning to suspect that the student who can't remember what (s)he heard in the story, but can describe in detail a television program, and the one who is confused by the diagram, but can sequence perfectly the story (s)he read, are mirror images of the same phenomenon. In like manner, the student who can say the words in the book, but doesn't "comprehend" what has been read, or the student to whom the graph is a mystery, may represent our default in understanding rather than theirs.

Now what do all of these interesting findings mean to educators in the conduct of day to day schooling? First, they clearly mandate the responsiblity for beaming instruction so that, whenever possible, information that is presented in a linear fashion across time (reading it or hearing it), is also presented in visual space (seeing or imaging it) so students have practice in integrating the information from their two hemispheres. Second, these findings suggest that whenever a student is not "getting it," the stimulus should be augmented or replaced with one that is beamed to the other hemisphere. Third, deliberate incorporation of practice that could increase facility in the use of each hemisphere singly and in concert should become an important educational objective.

Rather than elaborate diagnostic schemes to determine which brain a learner prefers, instruction to achieve these objectives includes:

1. Presenting stimuli simultaneously to both hemispheres.

2. Augmenting a stimulus by following it with information beamed to the opposite hemisphere.

3. Deliberate beaming to only one hemisphere for practice to increase fluency in processing one type of information.

Let's look at examples of each of these professional strategies:

1. Presenting stimuli to both hemispheres

Modeling often is an effective way to simultaneously augment the more typical verbal or written instructions by pairing the words with the visual input. Doing an example on the chalkboard while giving a verbal explanantion or having someone perform the act while hearing the directions, are possiblities for this pairing.

Examples:

"Now listen to what I'm thinking while I'm doing this problem. I can't subtract 7 from 3 so I need to regroup from the tens to the ones. I'll take a ten from _____" (while the work is being demonstrated on the chalkboard).

"Listen carefully while I give directions and watch what I am doing."

"Tell us what this graph is displaying."

"Watch me and listen to what I am thinking as I make a 'k,' I start at the top and make a straight line...."

"Say to yourself what you're doing while you're doing it."

The importance of modeling cannot be overemphasized. "Observational learning" can result from "seeing someone else do it." Successful teachers have been using this technique for years, but only recently have we known why the dual input of "seeing it" and "reading or hearing about it" was such an effective educational strategy.

2. Augmenting the stimulus by following it with information beamed to the other hemisphere when the student is not "getting it."

Obviously, hemisphericity is only one of the many reasons for learning difficulty. For the learner to be successful, the learning task must be at the right level of difficulty with all necessary subordinate learnings having already been achieved. The student must be motivated to exert learning effort. The learning should have been made meaningful and relevant to the learner. Practice should be appropriate to the task and to the learner. Changing hemispheric input systems, however, can aid and often remediate a learning problem.

Examples: Alternate

"Watch while I do one," and "You tell me what to do."

"Look at this, now find another one like it," and "I'll describe one, you describe another one like it."

"Look carefully so you match yours to mine," and "You say one like the one I say."

"Let's talk this one through," and "Let's act one out - do one without talking."

"Make a picture of 6 x 7," and "Describe this multiplication picture."

"How would you show that with dots?" and "What do these dots show?"

"Find it on the map," and "Say what the map shows."

"We would graph it like this," and "How would you interpret this graph?"

"If we put it on a time line, where would it be?" and "If we translated the time line into words, we would say...."

"Do what I say," and "Show me what I should do."

Of great importance in giving learners the "assist" of using both hemispheres, is asking the student to generate examples from his own experience. Not only does this add imaging which transfers learning from the past to give added meaning to the present experience, but it enables the teacher to check the accuracy and validity of the student's perception and understanding of the present learning.

Examples:

"Make up a word problem that will go with 250 ÷ 25 = (or 4 + 8 =)."

"What things would Goldilocks try out in your house?"

"What traits do you have that make you like Columbus?"

"What have you done that is the same as _____?"

3. Deliberate beaming of instruction to only one hemisphere to enable students to practice handling unaugmented, nonintegrated input.

Examples:

"Read the directions and see if you can do it."

"Look at the diagram and see if you can figure it out."

"Look at this design and see if you can make one just like it."

"Listen to my directions and see if you can make the figure I am describing."

"Read the chapter and answer the questions."

"Look at this sequence of 3 pictures and draw what the 4th might be."

Schools long have realized the importance of augmenting the written or spoken word with chalkboard, pictures, diagrams, graphs, etc. As technology advanced, more sophisticated audio (left-brained)-visual (right-brained) materials became available to teachers.

The audio of spoken words (not music), while using the same language (left-brained) input system as reading, eliminated the barrier created by the necessity for possession of the skill of reading to decode letter symbols into sound - into speech - into meaning. Not knowing the neurological reason, those visuals were important. Unfortunately, however, "audio-visual" became an end in itself with millions of dollars being spent on materials that in some cases were poorly designed, ineffectively executed, and unintelligently used.

With the advent of television, which is primarily a right-brained input system (configurations of dots in space to which significance is assigned) and which is augmented by the temporal input of speech (often the same few words repeated over and over as in T. V. commercials), the whole world, literate and illiterate, is able to receive information without so much left-brained processing, and in spite of inability to surmount the hurdle of decoding written speech into meaning. With television, the right-brained individual can take his/her proper "place in the sun" with his/her left-brained, formerly advantaged, friends, in terms of "knowing about" and "understanding" both current issues and mankind's past. The "Ascent of Man" and the horrors of Vietnam are no longer privileged communications to the "ones who were there" or the left-brained scholars.

While language and linguistic markers are processed in the left hemisphere, it is interesting to note that the sonorous clues of timbre, intonation, pitch, etc., of the spoken words are processed in the right hemisphere (as is music). "Hearing what (s)he says" and "hearing what (s)he means" can be different messages, each processed in a different hemisphere and posing the problem as to which message

the receiver accepts as the valid one. Recently, nonverbal communication, the interpretation of kinetic (movement), iconic (images), and soncrous (sound) clues, has come into high visibility as a right hemispheric function. "Intuition" could be a manifestation of this kind of "knowing" without being told by words.

It is important for the teacher to note that his/her own verbal and nonverbal communication must deliver the same message or "what you do speaks so loudly I can't hear what you say" may result. The younger child is particularly responsive to nonverbal cues. For integrated perception and development of facility with both hemispheres, language, plus visual, and kinetic, plus sonorous clues constitute the most effective communicative process.

What is our final educational responsibility, we who are not neurologists, we who are not responsible for the re-education of victims of accident or those who evidence brain pathology, we who have the important responsiblity for making learning more probable, more predictably successful,more efficient and more effective for those millions of students, from preschool through post secondary education, that are entrusted to our classroom guidance?

We must, of course, follow the paths of the researchers, translating, as soon as we are able, their findings into classroom practice. We must, with that translation, make available to every teacher, in language (s)he can understand, strategies that effectively and comfortably can be used in his/her classroom regardless of budget, organizational scheme, materials available, pupil-teacher ratio (granted all of those are important, but not determining variables). We must, in turn, present questions and concerns that will focus researchers on areas most productive in terms of learning

gain for students. And finally, we must incorporate in our dissemination of important information, our acknowledgment that "we must practice what we preach" and develop left-brained and right-brained input of the information, modeling by our own behavior the fact that neither brain is superior to the other, neither is the chosen one, both are essential to integrated thinking and this world would be a better, more accepting, more stimulating, and more fulfilling place for all of us if we accepted the difference, recognized the similarity, and acknowledged the right to learn of all students: Therefore, as a beginning step, we must deliberately incorporate those strategies which reflect research in hemisphericity into our daily teaching and augment (not replace!) with right-brained input, the predominately left-brained educational programs currently in our schools.

REFERENCES

Bogen, J.E. "The Other Side of the Brain I: Dysgraphia and Dyscopia Cerebral Commissurotomy." Bulletin of the Los Angeles Neurological Society; 34 1969a, 73-105.

_____. "The Other Side of the Brain II: An Appositional Mind." Bulletin of the Los Angeles Neurological Society; 34, 1969b, 135-162.

"Education and the Hemispheric Process of the Brain." UCLA Educator. Graduate School of Education. University of California, Los Angeles. Volume 17, Number 2, Spring, 1975.

Gazzaniga, Michael S. The Bisected Brain. New York: Appleton-Century-Crofts, 1970.

Guyer, LaRue. Hemispheric presentation of letter stimuli to children with and without reading problems. Unpublished research report, UCLA Psychology Dept., June 1972.

Kimura, Doreen. Cerebral dominance and the perception of verbal stimuli. Canad. J. Psychol., 15(3): 166-171, 1961.

Moscovitch, Morris & Catlin, Jack. Interhemispheric transmission of information; measurement in normal man. Psychon. Sci., 18(4): 211-213, 1970.

Nebes, R.D. Superiority of the minor hemisphere in commissurotomized man for the perception of part-whole relations. Cortex, 7(4): 333-349, 1971.

Albert Paul Malvino (Ph.D. EE) is the President of Malvino Inc., in Mountain View, California. His company produces Whole-Brain Learning Systems™ for basic electricity and electronics.

WHOLE-BRAIN LEARNING

ALBERT PAUL MALVINO

WHOLE-BRAIN LEARNING is based on the idea that visual images are just as important as words when you are trying to learn something new. The reason is that the human brain is organized like a pair of computers. The left half of the brain is a symbol processor; the right half of the brain is an image processor. The data in these two brain halves must combine into a unified whole for deep understanding to take place.

THE TWO HEMISPHERES

When we look at the brain, it appears to be a single organ. But a closer examination reveals that it is two separate hemispheres joined by a bundle of nerve fibers called the *corpus callosum* (Fig. 1). The corpus callosum allows the two hemispheres to exchange information. Looking at the two brain halves, a philosopher might ask "Is there one mind here or two?" The traditional answer is one mind. But the one-mind model turns out to be as short-sighted as the idea that the world is flat. As you will see, a new Christopher Columbus claims that we have two minds, not one.

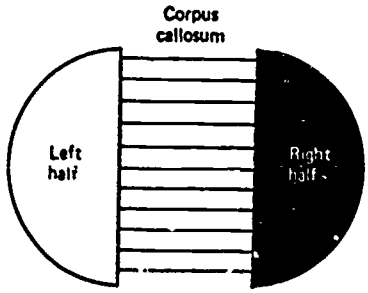


Figure 1. Structure of human brain.

THE DOMINANT LEFT HEMISPHERE

Before the 1960s, anatomists had already examined the brain and could see two distinct halves connected by the corpus callosum. Furthermore, it was already known that a crossover wiring existed between the brain and body.

CONTINUED ON PAGE 9

CONTINUED FROM PAGE 7

For example, a serious injury to the right side of the head paralyzed the left side of the body, and an injury to the left side of the head paralyzed the right side of the body. Another curious phenomenon was that injuries to the left half of the brain rendered people speechless, but injuries to the right half of the brain did not impair speech. Because of this, people used to believe that the left half of the brain was the center of the intelligence, while the right half was a silent partner that did nothing but control the left half of the body.

DUALITY OF THE HUMAN MIND

Radical changes in brain theory began in the early 1960s. Dr. Roger Sperry (California Institute of Technology) had been experimenting with cats and monkeys trying to find out what the corpus callosum did. In his experiments, he cut the corpus callosum to isolate the two brain halves. To his astonishment, the cats and monkeys remained normal in every way.

These results prompted Drs. Bogen and Vogel to perform a similar operation on an epileptic patient. The patient's seizures had become so violent that death was near. Bogen and Vogel assumed that cutting the corpus callosum would reduce the severity of the seizures because the brain half originating the seizure would be isolated from the normal brain half.

The operation was more than a success. The epileptic seizures disappeared completely. Furthermore, the patient appeared normal in every way. Because of this historic operation, split-brain surgery became the method of choice for treating severe epilepsy. As a result, many epileptics had this kind of brain surgery. This allowed Dr. Sperry to extend his brain research to human beings.

What followed won a Nobel prize for Sperry. Although the split-brain patients seemed normal, they were not. Something was different, but it required special apparatus to discover. With the help of Dr. Michael Gazzaniga, Sperry examined dozens of split-brain people and came to the following conclusions:

1. The left half of the brain thinks in words and numbers.
2. The right half of the brain thinks in pictures and other nonverbal images.
3. The two brain halves are so different that it is more accurate to speak of a left brain and a right brain than of a single brain.
4. It is impossible to describe in words how the right brain works.

Drs. Galen and Ornstein (University of California Medical Center) confirmed the Sperry conclusions using a different experimental approach. Alpha waves occur in the brain when it is resting and beta waves appear when it is active. Galen and Ornstein discovered that someone reading a book had beta waves in the left brain and alpha waves in the right brain. Conversely, someone drawing a picture had beta waves in the right brain and alpha waves in the left brain. The conclusion: the left brain processes words and the right brain processes visual images.

IDEAL LATERALIZATION

Ideally, the left brain is the source of language, number, sequential thinking, logic, verbal memories, and verbal consciousness. The right brain is the source of visual images, music, spatial relations, intuition, visual memories, and nonverbal consciousness (Fig. 2). In the west we tend to think the self-talk inside our heads is our total consciousness. But people in eastern countries have long known that there is more to human consciousness than the self-talk of the left brain. In fact, many eastern philosophies distrust language because they claim it creates illusions and limits our perception of reality.

The east may be right. Apparently, vision has the power to create. The great achievers always visualized the results they were aiming at. The methods for getting there would then appear in the form of hunches, dreams, and intuitions. In short, the breakthroughs in science and other fields usually originate in the right brain. This is the same brain that before the 1960s was thought to be useless except for moving the left half of the body.

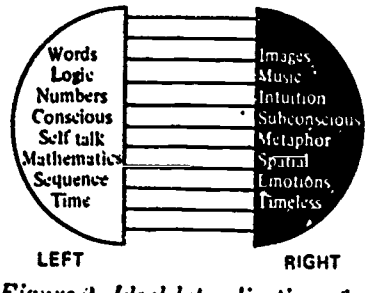


Figure 2. Ideal lateralization of human brain.

The left-brain/right-brain model applies to 95 percent of the U. S. population. You may be wondering why the left brain has emerged as the word processor and the right brain as the image processor. One explanation is this: For evolutionary reasons, infants tend to hear slightly better through the right ear. Because of the crossover in brain-body wiring, sounds enter the left brain more efficiently. This slight edge leads to the left brain specializing in word and other symbol processing, while the right brain handles image and other nonverbal processing.

THE PROBLEM WITH EDUCATION

Everyone knows something is wrong with traditional education. It's too narrow, too pat for the real world. It fails to train the subtle parts of the mind. It ignores wholistic and intuitive learning. Why is this? Because traditional education is still based on the pre-1960s model of the human brain. Too many educators still believe there is only one right answer to a problem, and even worse, that there is only one right way to solve a problem. In other words, most schools in the United States continue to educate a student as though he or she has only one brain. They do this by stressing calculations, formulas, logical analysis, sequential thinking, and all those functions associated with the left brain. This is unfortunate because human understanding seems to be based on vision.

The bulk of consciousness is centered in the right brain during the early years of life. After the left brain becomes proficient in language, a shift starts to take place in consciousness. The child begins to use the left brain more and more. At some point beyond the fifth grade, the educational system comes to emphasize left-brain learning almost totally, partly because words and numbers have been mistakenly identified with total human intelligence.

The higher one moves through

CONTINUED ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

the educational system, the greater the emphasis becomes on left-brain learning. If the right brain does get any stimulation in science classes, it is usually an accident, unless an outstanding teacher is involved. By the time someone graduates from college, he or she typically has a well-developed left brain and a withered right brain.

TOWARD THE WHOLE BRAIN

Based on my research, I have arrived at a hypothesis for how we understand things. I believe the following three steps are necessary to understand almost any concept:

1. A visual image of the concept must be stored in the right brain.
2. A verbal description of the concept must be stored in the left brain.
3. The visual and verbal memories have to be connected.

There may be exceptions, but as a guideline, I have found these three steps are necessary for understanding the concepts of science and technology.

These three steps are my definition of whole-brain learning, the type where something new is created in the brain. In other words, I believe the correlation of visual images and verbal descriptions produces a synergistic effect whereby the whole becomes greater than the sum of the parts. The idea is similar to a chemical reaction. When you combine hydrogen and oxygen, you get water. The water has new properties, quite different from either hydrogen or oxygen. Similarly, whole-brain learning means the visual and verbal data in the two brains combine to create a Eureka effect, a discovery of the full meaning of a concept.

APPLYING WHOLE-BRAIN LEARNING TO TECHNICAL EDUCATION

As a teacher and a writer for the past 20 years, I've been trying to discover what happens when real understanding takes place. I think my three-step hypothesis goes a long way toward answering the question. What follows are some suggestions for whole-brain teaching of technical subjects. These are guidelines to help you think

CONTINUED ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

about how you might adapt these ideas to your teaching style.

1. Start by accepting the *duality of human mind*, the notion that a human being has two minds or modes of thinking. To reach one of these minds you have to use words, numbers, logic, and formulas. To reach the other mind, you have to use pictures, diagrams, visual aids, and metaphors.

2. In the typical educational setting, the left brain is feasting, while the right brain is starving. Because of this, the simplest way to implement whole-brain learning is to use *more visual aids*. The old saying that a picture is worth a thousand words falls short of the mark. Some pictures defy verbal description. They contain information that only right brain can absorb. Because of this, a student can develop an intuitive understanding from visual images. Once the student has this intuitive grasp of the concept, you can add the technical terminology and mathematics that produce whole-brain understanding.

3. Time and time again I have asked students with difficulties to describe their problem. In almost every case, there was no visual image of the concept they were struggling with. Therefore, I've come to the conclusion that human understanding seems to be based on vision. Even the words we use confirm the idea of vision-based understanding. We have expressions like "Now I see" or "Do you see what I mean?" I think this is more than a coincidence. I think it is virtually impossible to understand anything without some kind of visual model. Geniuses like Newton and Einstein relied heavily on visual models for their mathematical derivations.

So another suggestion I have is this. When you are troubleshooting a student's difficulty, work on the *visual image* of the concept first. Make sure the student has some of kind of picture of what he or she is trying to understand.

4. One of the left-brain traps of technical education is the idea that every problem has only one right answer. Sometimes this is true and sometimes it is not. Based on my experience through graduate school, I think one-answer solutions are emphasized to the point that students stop looking for more than one right answer. This is unfortunate because most of the problems encountered in industry have *many right answers*. Often, the best solution to a real-life problem is the second or third right answer that you can find.

Being aware of the one-right-answer trap is a beginning. I would also ask open-ended questions that encourage more than one right answer. And I would also make up some homework problems that had several right answers.

5. Some people scoff at the idea of intuition, claiming it doesn't exist, or that it is logical thinking taking place at high speed. Such people don't know their left brain from their right. *Intuition* can be defined as those thinking processes that we cannot explain verbally because they take place in the right brain. Recall that Sperry's fourth conclusion was that we cannot explain in words how the right brain works. This means the right brain can process data without our being verbally aware of it. Since the right brain is nonverbal, it processes data on a different level of consciousness.

So, I would accept the existence of intuition and would try to develop it in my students. If you have any reservations about intuition, consider that even Einstein said "The really valuable thing is intuition."

6. Finally, I would try to develop *what-if thinking* (right brain) as well as sequential thinking (left brain) in my students. Sequential thinking is what we usually do. It is the kind of thinking where the result of each step is used in the next step. It is logical and mathematical. It is neat and clean and unforgiving. It is what a computer does. What-if thinking is different. This is the kind of thinking where anything goes and all things are possible. What-if thinking searches for more than one right answer. It is sometimes illogical, it breaks the rules, it makes mistakes, it is playful, it is sometimes foolish, and it is creative. □

LEARNING AND REMEMBERING

How People Learn

1% through taste

1-1/2% through touch

3-1/2% through smell

11% through hearing

83% through sight

How Much People Remember

10% of what they read

20% of what they hear

30% of what they see

50% of what they see and hear

50% of what they say as they talk

90% of what they say as they do a thing

How Long People Remember

Method of Instruction	Recall 3 hr. later	Recall 3 days later
A. Lecture Method only	70%	10%
. Demonstration Method Only	72%	20%
C. Both Lecture and Demo	85%	65%

Melay Publish Corporation
Education Publishers

ALL THINGS BEING EQUAL YOU'LL REMEMBER --

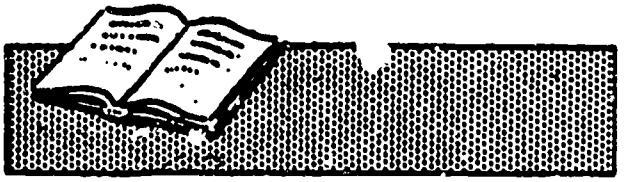
THIS MUCH OF WHAT YOU HEAR

10%

THIS MUCH OF WHAT YOU SEE

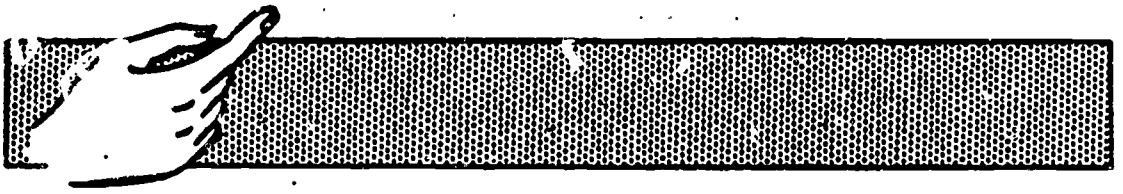
20%

THIS MUCH OF WHAT YOU READ



50%

AND THIS MUCH OF WHAT YOU DO



90%

SO <u>DO</u> ALL YOU CAN!

BASIC TEACHING TECHNIQUES THAT WORK

GROUP DISCUSSION

When you want to involve all your students in exploring an idea, in organizing and articulating their thoughts, in developing critical thinking--try the technique of group discussion. This method can also be used to advantage after a lecture, a film showing or a symposium or panel discussion.

Some Discussion Do's and Don'ts

1. Prepare in advance a few questions students may want to ask about the topic. This will prime the pump...will help students think of questions of their own. Tell them you have anticipated a few questions, and either pass them out, write them on the board, or read them aloud.

2. Don't answer student questions yourself, if possible. Ask the class if anyone can come up with an answer. Ask for additional suggestions on handling the problem.

3. If students have questions or topics different from the ones you prepared, use theirs. Yours are just a kick-off point to get them going.

4. Don't let any one person talk too often or too long. Simply say, "Let's hear from someone else now," or "I'm sorry to interrupt but we must let others in on the discussion."

5. If some people do not talk (there are silent or shy ones in every group), throw them a question--"How would you handle a problem like this?"

6. When one topic seems exhausted or the time is about up, summarize what has been said and add you own thoughts or ideas--then go on to another topic. Don't devote more than five to eight minutes on any one problem.

7. Involve the students in your summary, by asking "What is one important thing you have picked up from this discussion?" If no one responds, you can say, "Well, I've learned...Who else has something he or she will remember from our discussion?"

DEMONSTRATION AND PRACTICE

There are times in most skill classes when talk and textbooks are not enough: the participants need to be shown how a thing is done, and need opportunities to practice the skill themselves.

Demonstration Do's and Don'ts

1. Explain the purpose of the demonstration. Make your explanation clear and simple. Make sure all students understand.

2. Make sure every member of the group can see what is going on.

3. Do not demonstrate too many steps at once. If it is a complicated procedure, demonstrate one segment at a time, and allow time for questions about that segment.

4. Repeat the procedure slowly, emphasizing key points, and again encouraging questions.

5. Allow time for every member of the group to practice the operation. while you move about the room, observing, assisting, and correcting individuals as they practice.

6. Limit comments and questions during the demonstration to what is actually being demonstrated. Tell students there will be time for questions on broader aspects of the subject later.

7. If appropriate, have a general class discussion of difficulties, variations, applications, after the demonstration and practice period. This will cue you to specific learning difficulties--which students need special help, and of what kind.

ROLE PLAYING

This technique helps students to actually experience a human relations situation, rather than simply read or hear about it. It is particularly useful in business education, in adult basic education, in family life education. By acting out a situation, people gain insight into their own feelings and those of others.

Some Role Playing Do's and Don'ts

1. Select the role-playing situation from a discussion topic, or from a problem a particular student has brought to the classroom. For example, John reported that he applied for a job, had a job-interview, but didn't get the job. He tells what happened during the interview. You can then ask "How could that interview have been handled differently? Would anyone like to play John's role and another the interviewer's role?"

2. As players act out the situation, ask them to comment on "How do you feel now as John, being interviewed?" and "How do you feel about John as the prospective employer? Would you hire him? What should he have done differently?"

3. Avoid rehearsing, but do set the stage for the players by describing the scene and answering any questions they might have--asking John exactly what he said and did, what he wore, etc.

4. Follow up by having the two players switch roles, one now playing the interviewer, the other the interviewee.

5. If someone does not want to be a role player, encourage him/her but don't push. But if this method is introduced in the right spirit, it usually rouses people's interest and they rarely refuse to cooperate.

6. Do not assign a role too close to a person's character, which could be

embarrassing. He/she will probably learn more by playing a completely different kind of person. A very assertive person, after taking the part of a very shy person, said it had been a useful experience.

7. Some amount of clowning or initial awkwardness is to be expected. But if horseplay gets out of hand, or shyness and silence take over, gently remind them of the time remaining, and ask them to get on with the problem situation.

8. Invite the rest of the group, who have observed the role playing, to give their opinions about what went on. Discussion should relate to how it feels to apply for a job, to be questioned, corrected, advised flattered, or whatever the role-playing sequence tried to portray.

9. If possible, give every member of the group an opportunity to be part of a role-playing sequence, rather than a mere observer.

10. Explain to participants that role-players should not "ham up" or overplay their roles. Every part should be undertaken as if it were real.

11. One way to involve more people: divide the class into small groups so that the number of people in each group equals the number of roles to be assigned, then appoint several as observers.

ASKING QUESTIONS

All students are familiar with teachers who feed them information and then ask questions about it. This is often merely the time-worn game of "Let's guess what the teacher wants us to say." However, skillful question-asking plays a vital part in teaching adults.

Asking Questions: Some Do's and Don'ts

1. Ask for more information. By asking the responder to be more explicit and perhaps more sure of his/her answer, "Can you give me an example?" or "When you say xyz, what do you mean?"

2. Make critical observations, to make the learner look at his/her answer in a more probing way. "Why do you think that is so?" or "How would you explain your answer to someone who feels just the opposite?"

3. Encourage silent members to comment if you think they might have the answer but are reluctant to speak up. "This is probably something you know quite a bit about, David."

4. Piggy-back new questions on top of the responses you get for your previous question. "OK, let's take that approach and take it one step further."

5. Try not to answer your own questions too often. After a while you will be performing a one-person show...with little learning produced.

6. Don't ask "Are there any questions?" We all know the silence that

typically follows this question. Here are some questions that are more likely to bring responses as you proceed through a talk or demonstration:

1. "Before I go on, does this make sense to you?"
2. "Am I going too fast?"
3. "I am not sure I am doing this right. Do my examples make sense to you? Do you need additional information from me?"
4. Ask "Are there any questions you want me to answer?" Wait for five seconds, then address a person who you feel has, or ought to have, a question: "Perhaps you could start, Henry?"

IDEA PAPER No. 7

center for FACULTY EVALUATION & DEVELOPMENT
Division of Continuing Education
Kansas State University

AUGUST 1982 KANSAS STATE UNIVERSITY

QUESTIONING IN THE COLLEGE CLASSROOM

Ronald T. Hyman
Rutgers University

College teachers share with all teachers an essential characteristic—they ask questions. The question-answer dyad is central to the thinking process and therefore essential to effective teaching. Indeed, it is impossible to conceive of a teaching situation in which questions by the teacher and the students are not asked and answered. When teachers teach, they talk; when they talk, they ask their students questions to stimulate thinking.

PURPOSES OF TEACHER QUESTIONS

A teacher might be able to accomplish most teaching through pedagogical techniques other than questioning. Asking questions, however, is a direct, sensible approach which is focused on the topic at hand. The following list of purposes for questioning is descriptive and does not imply approval. It merely illustrates some of the purposes teachers have in mind when they pose questions.

1. diagnose a student's degree or level of understanding of a concept, topic, etc.

2. involve the student, help keep the student alert, and/or provide an opportunity for the student to shine in front of classmates.

3. test a student's knowledge and understanding and/or determine the extent to which supplied data can be used to reason and solve problems.

4. review, restate, and/or summarize fundamental points from previous sessions.

5. provide a springboard for discussion, stimulate creative imagination, and/or obtain ideas to which class members can react.

6. maintain discipline or stop a student from disrupting the class.

Obviously, one question may serve two or more purposes simultaneously. A teacher may not be aware of all of his/her purposes in asking a particular question, and the results of the question may not be clear until the responses are analyzed in the context of the lesson. Student thinking is generally concentrated on the content of the teacher's question. Rarely does the student become aware of its multiple purposes.

It should be pointed out that purpose number 6 above differs significantly from the others listed. There is an important distinction to be made between asking a question to keep a student alert and involved and asking it as a tactic to embarrass a student who is disturbing the class, sleeping, reading a newspaper, or whatever. Such a tactic subverts the primary purpose of teacher questioning, which is to stimulate student thinking on a specific topic. A teacher is better advised to call for a student's attention in a straightforward way.

Since questioning is an essential teaching tool, it makes sense to use it to best advantage by learning about: different types of questions, effective tactics for asking questions, strategies to guide question asking, methods for fielding student responses, and approaches for fielding student questions.

TYPES OF QUESTION

The research literature on questioning offers several basic systems for categorizing questions according to the cognitive processes which the questions require the respondent to perform. In my opinion, the best system for categorizing questions in the college classroom is the eclectic one devised by Rodney F. Riegle (1976). Riegle lists three main types of questions:

1. Interrogative Questions: those that request information, regardless of form.

2. Rhetorical Questions: those with an interrogative form but not an interrogative function (i.e., they do not request information)

3. Ambiguous Questions: those that are functionally ambiguous (not clear whether they are interrogative or rhetorical) or semantically ambiguous (not clear which of the interrogative subcategories is appropriate)

For the purposes of this paper only the categories for the Interrogative Questions are of importance. (See Table 1.)

Table 1
Riegle's Question Classification System

Interrogative Questions: Sentences with an interrogative function, regardless of form (i.e., requests for information).

A. ***Empirical:*** Questions about the world and our experiences of it.
1. ***Causal:*** Questions about the cause of something.
   a. Why did the pond freeze?
   b. What caused World War I?
2. ***Teleological:*** Questions about someone's purpose, aim, or goal.
   a. Why did Nixon visit China?
   b. Why did our president choose Vancouver as the site of the 1976 PES Convention?
3. ***Functional:*** Questions about something's function.
   a. Why does the liver secrete bile?
   b. What is the function of the pancreas?
4. ***Non-normative Judgment:*** Requests for an estimate, prediction, ranking, or grading, but not value judgments.
   a. How far is the green?
   b. Who will win the election?
   c. Is the second note higher or lower than the first?
5. ***Descriptive:*** Requests for descriptions.
   a. Requests for properties or characteristics.
      1. What color is it?
      2. What are the properties of iron?
   b. Requests for examples.
      1. What are some examples of homonyms?
      2. Give me a substance that dissolves in water.
   c. Requests for classifications.
      1. Is NaOH an organic or inorganic compound?
      2. What class of animals does the cat belong to?
   d. Requests for labels or names.
      1. Who is the President of France?
      2. Which part of the brain is the lowest?
   e. Requests for summaries.
      1. Summarize chapter three.
      2. What were the major points of this book?
   f. Requests for reviews.
      1. What have we said so far?
      2. What did the author say about ecology?
   g. Requests for procedures or processes.
      1. How is sulphur mined?

2. How did you get the answer to this problem?

h. Requests for chronological sequences.
   1. List in chronological order the events leading up to World War I.
   2. What sequence of events preceded Coolidge becoming President?

i. Requests for relationships.
   1. What is the relationship between the Big Dipper and the North Star?
   2. How is spelling ability related to reading ability?

j. Requests for comparisons.
   1. Compare Alabama to Auburn.
   2. What do these words have in common?

k. Requests for contrasts.
   1. Contrast materialism with idealism.
   2. What is the difference between organic and inorganic compounds?

B. *Analytic:* Questions about the relationships between verbal, logical, or mathematical symbols.
   1. *Linguistic:* Requests for definitions or the relationship between words.
      a. Define 'placid.'
      b. What does 'ambiguous' mean?
   2. *Logical:* Requests for the laws of logic or the relationship between logical symbols.
      a. Why is this argument invalid?
      b. Does that conclusion follow?
   3. *Mathematical:* Requests for the laws of mathematics or the relationship between mathematical symbols.
      a. What is 6 x 7?
      b. Why does angle A plus angle B equal 180 degrees?

C. *Normative Judgment:* Requests for evaluations, obligatory judgments, or justifications.
   1. Is Gerald Ford a good president?
   2. Should "Deep Throat" be banned?

D. *Preference:* Questions about likes and dislikes.
   1. Do you like ice cream?
   2. Don't you like coming to school?

E. *Metaphysical:* Questions about supernatural beings, events, etc., which have no agreed upon method for arriving at an answer.
   1. Does God exist?
   2. Why is there something rather than nothing?

Note: From Riegle (1978).

Using Riegle's categories it is possible to monitor and reflect upon the types of questions a teacher and his/her students ask. For example, a teacher's questions may fall into a narrow range of categories. If the instructor is interested in developing in the students the ability to perform a wide range of cognitive processes, then the instructor will prepare and ask a variety of questions. Suppose a history teacher finds that he/she generally asks for causal (A1) explanations and only rarely for teleological (A2), functional (A3), or chronological (A5h) explanations. Once aware of this pattern, the teacher can begin to ask noncausal questions aimed at getting the students to offer noncausal explanations.

Examination of an instructor's questions may reveal ambiguity in wording or intent. For example, a teacher may intend to elicit different types of explanations, but may phrase questions in such a way that the students do not know what type of response is sought. Suppose the teacher asks, "Why did Argentina invade the Falkland Islands in the Spring of 1982?" It is not clear whether this question seeks a causal, teleological, functional, or chronological explanation of the Argentines' action. Specifying the question clearly contributes to its effectiveness.

A teacher may be asking a broad range of questions and yet find that student questions are focused almost entirely on obtaining concrete examples of the items under study (A5b). This could indicate that students find the teacher's remarks abstract, difficult to understand, and lacking in the specifics they need for comprehension.

Examining student questions might show that students seldom ask each other for relationships (A5i). The instructor may need to take time to familiarize students with the variety of possible questions, provide models, and encourage practice so that students learn to broaden their questions during discussion.

TACTICS FOR QUESTIONING

Beyond the consideration of question type, there are several tactics suggested by the current literature which may assist teachers in improving the use of questioning in their teaching:

1. After asking a question, wait for a response. Do not answer the question yourself, repeat it, rephrase it, modify it, call on another student to answer it, or replace it with another question until you have waited at least three to five seconds. Students need time to think about the question and prepare their responses. The research indicates that with a wait-time of three to five seconds, students respond more, increase the length and number of their responses, use complex cognitive processes, and begin to ask more questions. Sometimes when teachers reword questions because they believe that the initial question is unclear, the result is greater student confusion. Students may not know which question to try to answer. (See Monber, 1971).

In another study, Mozer and Napell (1975) helped college physics teachers change their teaching behaviors. Increasing wait-time was one tactic emphasized. One teacher in that study said, "I tried to expand my 'wait-time,' and when students began to respond, I couldn't believe the misconceptions they'd held about some really basic concepts. If I hadn't allowed them time to speak up, I'd never have guessed at the gaps in their understanding of certain problems; I'd just have gone on talking over their heads 'til final exams."

In short, ask a question, wait, and thereby express your expectation to receive a response and your willingness to listen to it. **Be patient.**

2. Ask only one question at a time. Do not ask a string of questions one after the other in the same utterance. For example, ask, "Compare the skeleton of an ape with that of a human." Do not ask, "How are apes and man alike? Are they alike in bone structure and/or family structure and/or places where they live? A series of questions tends to confuse students. They are not able to determine just what the teacher is requesting from them. Napell (1978) states that videotape replays reveal an interesting pattern when the teacher asks a series of questions: "Hands will go up in response to the first question, and a few will go down during the second, and those hands remaining up gradually will get lower and lower as the instructor finally concludes with a question very different from the one for which the hands were initially raised."

Even if you believe that your question is unclear, wait for a response. You may find that students do indeed understand the question. By attempting to clarify you may change the meaning of the question, thereby adding to the confusion.

3. When student questions are desired, request them explicitly, wait, and then acknowledge student contributions. For example, a teacher may wish to solicit questions about the plays of Shakespeare which the class has been studying. Instructor might say: "Are there any questions or clarifications of points we have raised?" or "Please ask questions about the main characters or the minor characters, whichever you wish at this point." or "In light of Sally's allusion to Lady Macbeth, I invite you to ask her some questions for embellishment or clarification."

Indicate to students that questions are not a sign of stupidity but rather the manifestation of concern and thought about the topic. Be very careful not to subtly or even jokingly convey the message that a student is stupid for asking for a clarification or restatement of an idea already raised in class or in the text.

4. Use a variety of probing and explaining questions. Ask questions that require different approaches to the topic, such as the causal, teleological, functional, or chronological questions given earlier. One way to begin is to avoid the words "why" and "explain" and to phrase your questions with words which give stronger clues about the type of explanation sought. Thus, for a chronological explanation, instead of asking, "Why did we have a depression in the 1930s?" Try, "What series of events led up to the stock market crash of 1929 and the high unemployment in the 1930s?"

A variety of probes can also be used to stimulate different cognitive processes. For example, suppose that a student in a sociology class has stated that the female's most important role in society is to be a mother. The teacher could probe that statement by asking, "Why do you say that?" However, it might be more stimulating to ask the student or the class as a whole, "If you were Betty Friedan, Gloria Steinem, or Simone de Beauvoir, how would you react to that statement?" or "What are the positive and negative consequences that arise within a family when a woman devotes herself chiefly to being a mother?" or "What actions would you expect the government to take if and when it incorporated your idea into its social and economic policy?"

STRATEGIES FOR QUESTIONING

Beyond the tactics described above, questions need a strategic context or framework to enhance their meaning. An isolated question does not have the power that the same question has as the culmination of a sequence. For example, consider the first illustrative question about the Falkland Islands. Suppose the teacher has asked and dealt with the responses to the following questions: According to Argentina, what is the historical claim to the Falklands? What previous attempts did Argentina and Britain make to settle their dispute? Who did Argentina believe would support its action? What did Argentina believe would be Britain's reaction to the invasion? Now, suppose you ask, seeking a functional explanation, "What function, then, did the invasion serve for Argentina?" This question has impact because it is an outgrowth of the previous four questions. There is a synergistic and cumulative effect when the five connected questions are asked together. The students need to consider the responses to the previous questions when they offer their explanation of the invasion of the Falklands by the Argentines. Their explanation is enhanced by accounting for the data presented in the previous responses. Their cognitive processes are simulated as they grasp the direction the series of questions is taking.

The best context for a given question is a questioning strategy. A questioning strategy is **a carefully planned sequence of major questions designed to achieve a teaching goal.** The careful planning eliminates confusing gaps between questions and assures the inclusion of complementary questions that provide helpful insights, variety and spice to the discussion. Obviously, questioning strategies must be formulated ahead of time, since it is virtually impossible to do so in the midst of the fast-paced, active, complex interaction in the classroom. By planning ahead the teacher can better determine the progression of questions which serve as a model of logical thinking for the students.

TABLE 2

Resolving Value Conflicts

Questioner	*Respondent*
1. What is the value conflict about?	1. Identifies and describes the conflict.
2. What are the key words used in talking about this conflict?	2. Identifies central concepts.
3. Define the key terms.	3. Defines essential terms for clarity of communication.
4. What are the possible actions open to person X that will resolve the conflict? (What can person X do?)	4. Describe alternatives available.
5. What are the likely consequences if person X took the first (second, third, etc.) alternative?	5. Predicts consequences of the various alternatives.
6. What are the chances that these consequences will occur?	6. Estimates likelihood consequences happening.
7. Which consequences are good (desirable, preferred, advantageous) and which are not good?	7. Evaluates the consequences.
8. What is or would be a similar, related conflict and its resolution?	8. Describes a parallel situation.
9. Is there a general principle which indicates which value has priority over the other? If so, what is it?	9. Seeks overall ranking of values which will subsume this particular instance of conflict.
10. At this point, what do you think person X should do to resolve the conflict?	10. Expresses resolution based on previous points.
11. What are the reasons for resolving the conflict this way?	11. Gives reasons, justifies the suggested resolution to the value conflict.

Note: From Hyman (1979).

Table 2 offers a general questioning strategy for resolving value conflicts. Conflict occurs when a person must choose between equally important values. As the first step in this strategy the respondents must identify and describe the conflict at hand. This may appear to be simple, but it often takes time for students to pinpoint just where the conflict resides. It is essential that the teacher seek several responses to this question. If there is difficulty in this first step it may help to proceed to the next two steps, identifying and defining the key terms, and then to return to the identification of the conflict. Once the key terms are known it is often easier to decide just what the conflict is.

The general strategy should be modified and made applicable to the specific conflict under consideration. As the strategy is prepared, it is helpful to do two things:

1. prepare a right hand column similar to the one in Table 2 to serve as a check on the logic. By scanning the right column it is possible to check the cognitive processes required to see if they progress logically and if they lead toward the teacher's goal. This can also serve as a check on the range of question types being prepared.
2. prepare alternative ways to phrase some of the complex questions.

Attention to tactics and strategies enchances the effectiveness of the teacher's questions. Questions become a reliable means to stimulate student thought. For more specific help with tactics and strategies for interacting with students **see Strategic Questioning** (Hyman, 1979) and **Improving Discussion Leadership** (Hyman, 1980).

TACTICS FOR FIELDING STUDENT RESPONSES

One natural outcome of teacher questioning is student responding. It is important to attend to students' responses. The ways in which the instructor fields student responses will influence future responses. There are many options open to the teacher after a student response and no pedagogical rule mandating a particular behavior on the teacher's part. Nevertheless, one need not be a psychologist to realize that it is helpful to reinforce good responses. Students look to the instructor for guidance and support. If the instructor ignores them or shows virtual indifference, student behavior may be inhibited even if it is appropriate. Chastised students, and especially those who feel humiliated, may become so angry or fearful that they will refuse to respond in the future.

The goal, then, is for the instructor to field responses in such a way that the quantity and quality of future responses are enhanced. The following are several tactics for fielding responses. Please keep in mind that these tactics do not indicate how to field all types of responses under all conditions.

1. Praise the student in a strong, positive way for a correct or excellent response. Use such terms as "excellent answer," "absolutely correct," and "bull's eye." These terms are quite different from the common mild phrases teachers often use such as "O.K.," "hm-hm," and "all right." Especially when the response is long, the teacher should try to find at least some part that deserves strong praise and then comment on it.

2. Make comments pertinent to the specific student response. For example, suppose that a student has offered an excellent response to the question, "What function did the invasion serve for Argentina?" The instructor might say, "That was excellent, Pat. You included national political reasons as well as mentioning the Argentine psychological drive to become the South American leader." This response gives an excellent rating to the student in an explicit and strong form. It also demonstrates that the instructor has listened carefully to the student's response by supplying comments specific to the student's ideas.

3. Make no comment at all after each specific response within a series of responses to a single question; make a general comment after the series of responses is complete. Suppose the teacher has asked the sequence of questions about the Argentine invasion of the Falklands. Before asking the final question, the teacher could designate three students to respond. The teacher could then nod or point to each in turn to supply answers. After the third response the teacher might say, "Those were excellent answers: the first emphasized national political functions, while the second and third concentrated on the psychological factors for Argentina within South America and in the world at large."

There are at least two good reasons for using this tactic to field multiple responses. First, the teacher's comments have the tendency to shift the focus of discourse back to the teacher. By nodding or pointing to the next student, the instructor keeps the focus on the students' response. Second, and more important, if the instructor praises the first student immediately, the second student is likely to pick up the message that the teacher expects an answer similar to the first one. The second student will hesitate to go off on another tack even though it may be a good one.

It is very important that the teacher keep track of the responses in the series so that they can be reinforced at the end. Fielding the responses in this way encourages each student's own particular response. It also helps students to learn that they do not need to have the teacher's comments after each of their responses.

4. Build on the student's response. If the instructor continues to discuss a point after a student response, he/she should try to incorporate the key elements of the response into the discussion. By using the student's response, the teacher shows that he/she values the points made. By referring to the student explicitly by name (e.g., "As Pat pointed out, the Falklands national political status . . .") the teacher gives credit where credit is due.

5. Avoid the "Yes, but . . ." reaction. Teachers use "Yes, but . . ." or its equivalent when a response is wrong or at least partly wrong. The overall impact of these phrases is negative and deceptive even though the teacher's intent is probably positive. The "Yes, but" fielding move says the response is correct or appropriate with one breath and then takes away the praise with the next breath. Some straightforward alternatives can be recommended:

a. Wait to a count of five with the expectation that another student will volunteer a correct or better response.

b. Ask, "How did you arrive at that response?" (Be careful, however, not to ask this question only when you receive inadequate responses. Ask it also at times when you receive a perfectly good response.)

c. Say, "You're right regarding X and that's great; wrong regarding Y. Now we need a correct Y so we can get everything correct."

d. Say, "Thanks. Is there someone else who wants to respond to the question or comment on the response we've already heard?"

These four alternatives are obviously not adequate to fit all cases. Indeed, it is generally difficult to field wrong or partially wrong responses because students are sensitive to teacher criticism. However, with these four alternatives as examples, an instructor will probably be able to generate others as needed.

TACTICS FOR FIELDING STUDENT QUESTIONS

Strange as it may seem many college teachers are ill at ease when students ask them questions. For some reason they have not learned to field questions. Fielding is a broader concept than responding; responding to a question is but one fielding option. The skill of fielding student questions is vital for a teacher who wants students to think about the topic under study; one result of student thinking is student questioning.

If there are few student questions, it may be that students are not attending to the teacher's remarks and not thinking about the topic at hand. Alternatively, students may be afraid to ask questions because they think they will be put down. It is also possible that students do not ask questions because they believe that the teacher doesn't want them to ask questions. That is, the teacher somehow discourages students from asking questions. This discouragement is rarely explicit; few teachers actually say, "Don't ask me any questions." (They may say, "Hold your questions for a few minutes.") Generally, the discouragement is implicit. It comes from the negative way a teacher fields a student question. For example, "We discussed that issue yesterday," or "That question is not really on target." Sometimes an instructor will answer the student's question and then say something like, "Where were we before we got sidetracked?" After one of these negative fielding moves a student may say, "I'll never ask another question in this class."

It is difficult to explain why teachers discourage student questions in this way. However, some tentative reasons can be offered. Teachers feel the need to be in control both of the content and of the procedures in the classroom. They feel that they need to "cover" the established course content. Time is precious. There is never enough of it to cover the material. Thus, they discourage student questions because the questions may lead them away from their material. Teachers also want to appear knowledgeable to their students. Student questions may embarrass the instructor who is unable to respond adequately. In short, instructors fear that they may lose control or lose face if students ask questions.

The potential for loss of control and loss of face is real. It surely is possible for a teacher to go off track and to appear to lack knowledge. However, it is also true that the fear of this happening is overdrawn and the probability for it to occur is low. The teacher must weigh the advantages gained by permitting and encouraging questions against the need to maintain tight control in order to be sure to cover the material and to appear knowledgeable. (In this author's experience, the advantages of student questions far outweigh the risks.)

Some tactics for fielding student questions in a positive way are in order. Again, these tactics do not suit all cases. They are simply examples of the options available.

1. Praise the student for asking a question. For example, "Thanks for asking that," or "That's a good question," or "That's an insightful question that everyone can consider." These are simple reactions and yet few teachers reinforce students for asking questions. College students need this reinforcement because their previous experience has generally led them to the conclusion that student questions are not valued.

2. Answer the student's question directly as often as possible. Students ask questions because they legitimately seek a response. They do not ask questions, by and large, to be cute or disruptive. Moreover, they want a response from the teacher. Do not play games with the student by asking a question in return or by stalling. By responding directly the teacher indicates that the question is worthwhile.

Teachers often deflect questions to other students or to the class in general. Students generally want the teacher to respond directly. If the instructor wants to hear first what other students have to say, the "deflecting" move can be prefaced with something like, "After we hear what some students have to say, then I'll offer my answer, too." or "I'm asking Joe to respond specifically since he is the expert on this particular topic. If you still want my response when Joe is finished, just let me know." In this way, the questioner is informed of the instructor's strategy and does not assume that the question is being avoided or discounted by the deflection to another student.

3. Let the student know if a question leads into a new area. If a student question prompts an instructor to launch into a new topic, the plan should be indicated to the class. For example, "That's an excellent question and it deserves further exploration.

To do so let's shift to topic X. I think you will see the response develop. If not, please ask again. Thanks." While this does not satisfy the student with an immediate and direct response, the teacher does indicate that the question is valued both explicitly through praise and implicitly by involving the student in the plans.

SUMMARY

The question-answer dyad in the college classroom is a critical teaching element. It is critical when the teacher is questioner and the student respondent, and it is especially so when the roles are reversed. To achieve the multiple purposes served by questions an instructor can (1) use a variety of different question types to stimulate the students' cognitive processes, (2) use appropriate tactics in asking questions, (3) formulate questioning strategies, and (4) field the students' responses positively. An instructor can promote student questioning by fielding questions in an encouraging, reinforcing manner. All of these suggestions can be helpful in making the student an active participant in classroom interaction and in stimulating student thinking.

References

Hyman, R.T. Strategic questioning. Englewood Cliffs, N.J: Prentice-Hall, 1979.

Hyman, R.T. Improving discussion leadership. New York: Teachers College Press, 1980.

Mortier, G. Wait-time in college science classes. Science Education, 1971, 55, 321-328.

Mozer, P.S., & Napell, S.M. Instant replay and the graduate teaching assistant. American Journal of Physics, 1975, 43, 242-244.

Napell, S.M. Using questions to enhance classroom learning. Education, 1978, 99, 188-197.

Riegle, R.P. Classifying classroom questions. In K.A. Sprague (Ed.), Philosophy of education 1976. Urbana, IL: Philosophy of Education Society, 1976.

HINTS ON THE ART OF QUESTIONING

1. Prepare your questions ahead of time. Be sure in your own mind that the group can answer them.

2. Try to get volunteers. People are often embarrassed by being called on. If you find it necessary to direct a question to a particular individual, call the person by name and then state the question. It gives him a chance--it is a courteous gesture. Such direct questions should be employed infrequently.

3. After asking questions, give the group a chance to think. You might write it on the board while the group is thinking. If there is no response, you may say, "Mr. Paul, you have had 15 years of experience in the mechanical department--may we have your opinion?"

4. Encourage complete and clearly expressed answers.

5. Be sincerely interested in the answers the group gives.

6. Be sure the same few people don't answer all the questions.

7. Questions that produce a "yes" or "no" answer should, if used at all, be followed by asking the conferee his reason for the "yes" or "no." WHAT, WHY, WHEN, WHERE, WHO, WHICH, and HOW questions cannot be answered by "yes" or "no."

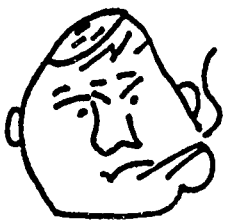
12 ROADBLOCKS TO COMMUNICATION

1.	ORDERING, DIRECTING, COMMANDING	Telling the other to do something, giving him an order or a command.
2.	WARNING, THREATENING, PROMISING	Telling the other what consequences will occur if he does something or carrying out the consequences (rewarding or punishing).
3.	MORALIZING, PREACHING, SHOULDS AND OUGHTS	Invoking vague outside authority as accepted truth.
4.	ADVISING, GIVING SOLUTIONS OR SUGGESTIONS	Telling the other how to solve a problem, giving him advice or suggestions, providing answers or solutions <u>for</u> him.
5.	TEACHING, LECTURING, GIVING LOGICAL ARGUMENTS	Trying to influence the other with facts, counterarguments, logic, information, or your own opinions.
6.	JUDGING, CRITICIZING, DISAGREEING, BLAMING	Making a negative judgment or evaluation of the other.
7.	PRAISING, AGREEING	Offering a positive evaluation or judgment, agreeing.
8.	NAME CALLING, LABELING, STEREOTYPING	Making the other feel foolish, putting the other into a category, shaming him.
9.	INTERPRETING, ANALYZING, DIAGNOSING	Telling the other what his motives are or analyzing why he is doing or saying something, communicating that you have him figured out or have him diagnosed.
10.	REASSURING, SYMPATHIZING, CONSOLING, SUPPORTING	Trying to make the other feel better, talking him out of his feelings, trying to make his feelings go away, denying the strength of his feelings.
11.	PROBING, QUESTIONING, INTERROGATING	Trying to find reasons, motives, causes; searching for more information to help <u>you</u> solve the problem.
12.	WITHDRAWING, DISTRACTING, SARCASM, HUMORING, DIVERTING, INDIRECTION	Trying to get the other away from the problem; withdrawing from the problem yourself; distracting the other, kidding him out of it, pushing the problem aside.

(FROM TIMBERLAKE ASSOCIATES)

DEALING WITH SITUATIONS

HOW HE ACTS	WHY	WHAT TO DO
 Overly Talkative	He may be an "eager beaver" or a showoff. He may also be exceptionally well informed and anxious to show it or just naturally wordy.	Don't be embarrassing or sarcastic... you may need his traits later on. Slow him down with some difficult questions. Interrupt with, "That's an interesting point...now let's see what the group thinks of it." In general, let the group take care of him as much as possible.
 Side Conversation	May be related to the subject. May be personal. Distracts members and you.	Don't embarrass them. Call one by name, ask him an easy question. OR Call one by name, then restate last opinion expressed or last remark made by group, and ask his opinion of it. If during conference you are in the habit of moving around the room, saunter over and stand casually behind members who are talking. This should not be made obvious to the group.
 Inarticulate	Lacks ability to put thoughts in proper words. He is getting an idea but can't convey it. He needs help.	Don't say, "What you mean is this." Say, "Let me repeat that" (then put it in better language). Twist his ideas as little as possible, but have them make sense.
 Definitely Wrong	Member comes up with comment that is obviously incorrect.	Say, "I can see how you feel" or "That's one way of looking at it." Say, "I see your point, but can we reconcile that with the (true situation)?" Must be handled delicately.

HOW HE ACTS	WHY	WHAT TO DO
 Rambler	Talks about everything except subject. Uses farfetched analogies, gets lost.	When he stops for a breath, thank him, refocus his attention by restating the relevant points, and move on. Grin; tell him his point is interesting; point to the blackboard; and in a friendly manner, indicate we are a bit off the subject. Last resort--glance at your watch.
 Personality Clash	Two or more members clash. Can divide your group into factions.	Emphasize points of agreement, minimize points of disagreement (if possible). Draw attention to objectives. Cut across with direct question on topic. Bring a sour mber into the discussion. Frankly ask that personalities be omitted.
 Obstinate	Won't budge! Prejudiced. Hasn't seen your points.	Throw his view to the group, have the group members straighten him out. Tell him time is short, you'll be glad to discuss it later; ask him to accept the group viewpoint for the moment.
 Won't Talk	Bored. Indifferent. Feels superior. Timid. Insecure.	Your action will depend upon what is motivating him. Arouse his interest by asking for his opinion. Draw out the fellow next to him, then ask the quiet lad to tell the fellow next to him what he thinks of the view expressed. If he is seated near you, ask his opinion so that he'll feel he is talking to you, not the group. If he is the "superior" type, ask for his view after indicating the respect held for experience. (Don't overdo this. The group will resent it.)

(FROM AMERICAN BUSINESS, DECEMBER, 1954)

TRANSFER

1. WHAT IS TRANSFER?

2. EXPLAIN POSITIVE TRANSFER.

3. EXPLAIN NEGATIVE TRANSFER.

4. GIVE EXAMPLES OF HOW YOU USE OR CAN USE THE SIMILARITY OF TWO LEARNINGS IN SOMETHING YOU TEACH:

   A. POSITIVE TRANSFER:

   B. NEGATIVE TRANSFER:

5. GIVE AN EXAMPLE OF HOW TO USE OR CAN USE THE ASSOCIATION OF TWO LEARNINGS IN SOMETHING YOU TEACH.

6. GIVE AN EXAMPLE OF HOW TO USE OR CAN USE THE DEGREE OF ORIGINAL LEARNING IN SOMETHING YOU TEACH.

7. GIVE AN EXAMPLE OF HOW YOU USE OR CAN USE THE IDENTIFICATION OF ESSENTIAL AND UNVARYING ELEMENTS IN SOMETHING YOU TEACH.

TRANSFER OF LEARNING

I. Transfer

A. Definition: The ability to learn in one situation and to use that learning in a modified or generalized form is called transfer of learning.

B. Purpose: Transfer is the basis of creative thinking, problem solving, and other mental processes.

C. Kinds of transfer:

1. Positive: When the old learning assists in the acquisition of the new.

2. Negative: When the old learning interferes in the acquisition of the new.

D. Factors which generate transfer:

1. Similarity of two learnings

2. Association of two learnings

3. Degree of original learning (better the learning, better the transfer)

4. Identification of essential and unvarying elements:

a. Categorization

b. Identification of the critical attributes

c. Preliminary practice

d. Generalization

E. How to teach to transfer:

1. Identify the factors that generate transfer, either positive or negative.

2. Learn to recognize those factors in an instructional situation.

3. Take the factors into account so that they work to the advantage of the learner.

THERE ARE MANY POSSIBILITIES; HERE ARE A FEW.

A. TABLE, DOOR, AND CHAIR BELONG TO THE CATEGORY OF ARTICLES WHERE WOOD IS THE MOST COMMON CONSTRUCTION MATERIAL OR WHOSE TEMPERATURE IS THE SAME AS THE ROOM AROUND THEM OR IN MOST CASES THEY ARE EASILY MOVED. EACH OF THESE ATTRIBUTES EXCLUDES REFRIGERATORS.

B. DOOR, CHAIR, AND REFRIGERATOR BELONG TO THE CATEGORY OF ARTICLES WHERE ONE'S FIRST VISUAL IMPRESSION IS USUALLY VERTICAL RATHER THAN HORIZONTAL OR THEIR NAMES DO NOT HAVE THE LETTER "B" BUT DO HAVE "R" OR THEY (OR PARTS OF THEM) OFTEN MOVE IN USE. EACH OF THESE ATTRIBUTES EXCLUDES TABLES.

C. TABLE, DOOR, AND REFRIGERATOR BELONG TO THE CATEGORY OF ARTICLES WHICH USUALLY PRESENT A SMOOTH FLAT VISUAL IMPRESSION OR WHOSE NAMES HAVE NO CONSONANT DIAGRAPHS (CH) OR WHERE OPENINGS TO, OR STORAGE SURFACES, OR BOTH ARE INCORPORATED IN THE OBJECT. EACH OF THESE ATTRIBUTES EXCLUDES CHAIRS.

D. TABLE, CHAIR, AND REFRIGERATOR BELONG TO THE CATEGORY OF ARTICLES WHOSE HORIZONTAL SURFACES PROVIDE THEIR MAIN UTILITY OR WHICH USUALLY HAVE CONTACT POINTS WITH THE FLOOR OR ARE ASSOCIATED WITH EATING. EACH OF THESE ATTRIBUTES EXCLUDES DOORS.

TRANSFER

Educational Theory			Into	Educational Practice	
Topic	Definition	Factor		Technique	Example
Transfer	The ability of the learner to use past learning in a modified or generalized form	Similarity		Environment Feelings Activities	
		Association		Environment Feelings Activities	
		Degree of Original Learning			
		Essential and Unvarying Elements		Categorization Identification of Critical Attributes Preliminary Practice Generalization	

TOPIC: TRANSFER

FACTOR: Similarity

- Student perceives the degree of commonality in the new learning
- Learner identifies two learnings or concepts with the properties that are the same
- Student perceives that the present is like the past or one learning is like another
- Learnings that look the same

FACTOR: Association

- Student links two learnings or concepts with properties that are related
- Student perceives learnings that go together or are linked
- Learner perceives the connection of two or more learnings
- Learnings that go together

FACTOR: Degree of Original Learning (see Retention)

FACTOR: Essential and Unvarying Elements

- Learner recognizes important parts of the learning
- Learner is able to identify critical attributes of the learning

T .CHING CONCEPTS, GENERALIZATIONS, AND DISCRIMINATIONS

Madeline Hunter

All higher order thinking is based on the thinker's possession and use of concepts, generalizations and discriminations. Thinking is a performance behavior which results from having learned both the necessary content and the thinking process involved. The ability to generalize (perform by thinking) entails the use of concepts rather than specific items of information. To generalize correctly requires the ability to discriminate when a generalization is applicable and when it is not.

CONCEPTS GENERALIZATIONS AND DISCRIMINATIONS DEFINED

A concept is the name of a category (chair, red, mammals, courage) which includes many members. For example, a chair is a piece of furniture with a back, on which only one person typically sits.

A generalization is a statement of relationships between or among concepts. To generalize is to treat perceivably different things as if they were the same. (Elephants, whales and mice are all mammals)

To discriminate is to treat perceivably similar things as if they were different. (A chair is not the same as a stool. A porpoise and a fish are not the same. A "b" is not the same a "d".)

To generalize and to discriminate are mirror images of each other. Both are based on accurate concept formation.

Higher order thinking requires the application of concepts, generalizations and discriminations to a new siutation: a situation to which the person does not have a ready or automatic response. If we wish higher thinking to occur in students, we need to learn how to teach

concepts, generalizations and discriminations so they contribute to the thinking required for creativity, problem solving and the making of responsible and satisfying decisions.

It is important to stress that "teaching" includes all modes of learning for which the teacher is responsible: direct instruction deductive, inductive, discovery learning, cooperative learning, or individual learning, plus use of prepared, written or AV materials. A teacher plans, prepares for and programs students' utlization of these modes of learning. The concept of teaching certainly includes more than direct instruction. (Incidentally, this is a concept many people still have not acquired.)

At times we may wish students to discover concepts, generalizations and discriminations by themselves. At other times we will teach them to students. The important issue is not how concepts, generalizations and discriminations are acquired but that they are acquired. That achievement is primarily the result of the professional skill with which the teacher works regardless of the mode of acquisition.

TEACHING CONCEPTS

A concept is the name of a category rather than a specific instance. To develop a concept, regardless of whether we teach it or students discover it, we first must identify for ourselves the critical attribute(s), or properties, or functions of the concept that make that concept what it is: that determine which members are included in or excluded from that concept or category. "A square is a closed figure with four equal sides and four right angles." Note the critical attributes of a square are themselves concepts: closed, figure, four,

equal, sides, right angles. Each of these concepts must be discriminated from other similar concepts: four from three or five, right angle from other angles, equal from unequal. Then the square must be discriminated from a trapeziod, rectangle or other parallelogram regardless of size, color, position, thickness of lines etc.

The critical attribute of the concept "compromise" is that each party gets some of what s/he wants but not all of what s/he wants. If a boy wants to use the car every Saturday and his father wants him to work in the yard, it is a compromise if some Saturdays he gets the car and some Saturdays he works in the yard. The number of yard and car Saturdays is not the critical attribute. There could be 1 and 3 in a month or there could be 2 and 2. The latter ratio would be the critical attribute of father and son having equal rights to determine what occurs on Saturdays.

Sometimes it is not possible to articulate the critical attribute. Even linguists have not specified the critical attribute of a sentence in a way we can transmit it to a student. In such cases, through the use of examples, we have to develop an intuitive (non articulated) knowledge of the concept. "The ball is in the tree," is a sentence. "The ball," or "The ball is," (subject and verb) or "in the tree" are not sentences.

Nevertheless the articulated or non-articulated (inituitive) critical attribute(s) of a concept must be understood by the student before valid discriminations can occur. Discriminations are made on the basis of presence or absence of critical attributes. "A circle is a continuous line with all points equidistant from the center." "A square is a four, equal sided, closed figure with four right angles." These

critical attributes must be perceived either intuitively or consciously by the learner if s/he is to discriminate a square and a circle from other forms.

Knowledge of the concepts which are related in a generalization is an essential first step before the generalization can be understood and subsequently applied to a new situation.

To certify possession of a concept requires the learner discriminate, generate or select new instances of that concept. This extension of understanding is called "elaboration" and creates a network of relationships in the learner's long term memory. A network is more easily stored and retrieved from memory than are single instances.

TEACHING GENERALIZATIONS

Generalizations include rules, statements of critical attributes and probability statements. A generalization expresses the relationship between two or more concepts. ("Dogs can be friendly." "People live in houses." "Periods go at the end of declarative sentences." "A response which is reinforced increases in probability or frequency.")

To teach or to acquire a generalization, the initial examples or instances of that generalization must be clear and consistant. Then the student should be presented with a wide variety of circumstances in which the generalization is held constant. Only after the generalization is well learned are exceptions presented.

Let's look at a simple example: the generalization that "two of anything plus two more of the same thing equals four of that thing." We represent this generalization by 2 + 2 = 4. To teach that generation, our examples should hold the generalization constant but present it in

the widest possible variety of circumstances. "Two candy bars plus two candy bars equals four candy bars." "2 days + 2 days = 4 days." 2 blocks + 2 blocks = 4 blocks. "2 minutes + 2 minutes = 4 minutes." "2 ideas + 2 ideas = 4 ideas."

When we are teaching the generalization that the letters c-a-t in that order spell "cat" we introduce "cat" on the bottom of the page, on the top and in the middle, in capital letters, in manuscript, in cursive, written on book jackets, on billboards, and on pictures.

When we wish the subject to discover the generalization. "When two or more subjects are joined by 'or', the subject closest to the verb determines the verb form," we introduce examples such as: "Dogs or a cat is in the house." "A cat or dogs are in the house." "He or they or I am going." "I or they or he is going." "He or I or they are going." We will use the same subjects but vary the order, so we focus the student on the relationship between the verb and subject closest to it.

If we plan to teach this same generalization by direct teaching rather than by discovery, we may use the same examples but we will teach the rule rather than have students discover it. Practice will continue with, "Harry or I am responsible." "Carrots or celery has fiber ." "Either you or he goes with me," to make obvious the relationship of the verb form to the closer subject.

TEACHING DISCRIMINATIONS

Making a discrimination is a process which requires the opposite kind of thinking from generalizing. Discrimination requires that of treating perceivably similar things as if they are different.

To teach students to discriminate between concepts or to discriminate between generalizations, we hold surrounding conditions constant and vary the presense or absense of the critical attribute(s) which indicate it is or is not an instance of that concept or generalization. Then the student needs to support or impeach the correctness of the discriminative judgment by identifying the discriminator being used. This will be clarified by the following examples.

To discriminate between the concepts of "addition" and "subtraction," we would hold everything constant except the critical attribute which indicates which operation is appropriate (combining quantities is the critical attribute of the concept of addition, separating parts from a whole is the critical attribute of the concept of subtraction.) "How many pennies would you have if you had three pennies and found two?" vs. "How many pennies would you have if you had three pennies and lost two?" "How many problems would you have done if finished 15 and then did 10 more?" vs. "How many problems would you still have to do if you had to do 15 problems and had already finished 10?"

To develop the discrimination between the generalization that "c-a-t spells cat" and other similar letter configurations we might ask the student to find the name of the animal that says "meow" in the following: can, cap, car, cat, cab, cad.

To test the students ability to discriminate between the concept of "cat" and "skunk" we would need to use pictures of a black and white cat and a skunk.

To develop the discrimination of which subject is closest to the verb, we would ask the students to circle the word that determines the

verb form and underline other subjects that had no effect. To develop the discrimination of that rule from the rule, "Whenever two or more subjects are joined by 'and' the verb is always plural" we would use sentences such as: "He or I ____ going" and "He and I ____ going", then have the student select the correct verb form.

Problems exist in teachers' use of psychological generalizations because discriminators are not taught so teachers can differentiate times when a generalization should be used by the teacher and when it should not because the situation is different. As a result, generalizations in teaching can become false absolutes.

Let's look at a way we might apply the psychological generalization, "Mass practice for fast learning, distribute practice for long retention (remembering)." The concepts of "fast learning" and "long retention" are familiar to teachers. The critical attribute of the concept of "practice" is doing something again to increase accuracy or fluency. The critical attribute of the concept of "massed" is practicing several times without intervening activities. The critical attribute of the concept "distributed" is that other activities occur between practice periods.

Using this generalization as one thinks about teaching, requires discrimination whether, at this point, learning is need and needs to become more accurate or fluent or whether that learning has been reasonably achieved and the objective is students' automating and/or remembering that learning. As an example, when the concept of "square" is being learned, students will mass practice, identifying squares of various sizes, shapes, colors. Once students have learned the concept "square", distributed practice will be utilized as to identify squares

with longer and longer time intervals between identifications so permanence of learning is achieved.

To teach the rule about "subjects joined by 'or'", we would give students many sentences with different subjects and varying numbers of subjects, holding the "or" which joins those subject constant (massed practice). Then we might review the learning the next day, skip a day, review, skip several days, review occasionally for long remembering (distributed practice). Eventually we would have students discriminate between sentences where subjects were joined by "or", and sentence when subjects were joined by "and".

SUMMARY:

To teach a concept, we identify (if possible) the critical attribute(s) of that concept and present that attribute in a wide variety of circumstances. The greater the variety of circumstances the more effective is the learning of that concept and the most accurately that learning will transfer to new situations.

To teach a generalization, we make sure students understand the concepts and the relationship among them. Then we hold the generalization constant in the widest possible variety of circumstances, the greater the variety of circumstances, the more mental operations on the part of the student and the more memorable and transferable that generalization will become.

To teach a discrimination, we hold the circumstances constant and vary only the presence or absence of the critical attribute(s) of that concept or generalization which the student must use to make the discrimination. The more discriminations a student makes when

surrounding circumstances are similar, the more quickly the discrimination will be learned and the longer it will be remembered.

Teaching concepts, generalizations and discriminations effectively is a major contribution to students' ability to think creatively, to solve problems and to make responsible, satisfying decisions.

NAME_____

DIRECTIONS: READ THE STATEMENT CAREFULLY. SELECT THE BEST RESPONSE AND PLACE THE CORRESPONDING LETTER ABOVE THE NUMBER WHICH MATCHES THE STATEMENT YOU ARE WORKING ON. DO THE SAME FOR EACH STATEMENT.

1. TRANSFER - A) THE ABILITY TO LEARN IN ONE SITUATION AND TO USE THAT LEARNING IN ANOTHER SITUATION. B) FOCUSES THE STUDENT ON THE NEW LEARNING.

2. SIMILARITY - C) THE TEACHER VERBALIZES THE DIFFERENCES IN THE TWO LEARNINGS TO GENERATE POSITIVE TRANSFER. E) THE TEACHER VERBALIZES THE DIFFERENCES IN TWO LEARNINGS TO CUT OFF NEGATIVE TRANSFER.

3. POSITIVE TRANSFER - F) IS LIKELY TO OCCUR WHEN A HIGH DEGREE OF ORIGINAL LEARNING OCCURRED IN THE FIRST PLACE. G) HAS NOTHING TO DO WITH SIMILARITY.

4. NEGATIVE TRASNFER - M) NEVER OCCURS IN SIMILAR LEARNINGS. N) INTERFERES WITH NEW LEARNING AND MUST BE CUT OFF.

5. ASSOCIATION - G) IS THE THIRD FACTOR UNDER RATE AND DEGREE. R) IS A CONNECTION IN THE MIND BETWEEN IDEAS OR FEELINGS.

6. DEGREE OF ORIGINAL LEARNING - R) IS THE RESPONSIBILITY OF THE STUDENT, NOT THE TEACHER. S) CAN GENERATE POSITIVE TRANSFER.

7. CRITICAL ATTRIBUTES - S) ARE EASILY IDENTIFIED BY SLOW LEARNERS. 5) MUST BE POINTED OUT BY THE TEACHER TO ASSIST IN POSITIVE TRANSFER.

QUESTION NUMBER:								
	7	5	1	4	6	3	2	5

Factor #1 SIMILARITY OF SITUATION

1. Learning to drive a car with automatic transmission and testing in an automatic transmission.
2. Testing in the same room the learning took place.
3. Testing the student in the mode he was taught.
4. Mock up of 747 cockpit is identical to the real thing.
5. Fire and tornado drills.

Factor #2 ASSOCIATION OF TWO LEARNINGS

1. Use synonyms for vocabulary drill.
2. Use pictures and symbols and have the group determine what the product is.
3. Give the group a word and put down first word that comes to your mind.
4. Show picture and identify the feelings associated with it. Have them record feelings.

Factor #3 DEGREE OF ORIGINAL LEARNING

1. Ask former veterans of armed services to give their service number.
2. Ask workshop participants to give their social security number without checking it first.
3. Have participants think about a poem they learned in their early school years.
4. Rule: i before e with exceptions

Factor #4 IDENTIFICATION OF ESSENTIAL AND UNVARYING ELEMENTS

1. I would know her walk anywhere.
2. As soon as I heard him laugh. . .
3. All mammals feed their young milk.
4. To produce sound, something must vibrate.
5. In a sentence, "I" must always be captialized because it is you and you are important.

GLOSSARY

Active Participation: Active responding by a student. It may be thinking (covert) behavior or observable (overt) behavior. Active participation increases the rate and degree of learning. However, just any activity will not do. Only relevant student responding increases learning.

Affective Domain: Referring to learning involving interest, attitudes and values and the development of appreciation. Krathwohl has categorized objectives in this domain into: receiving, responding, valuing, organization, and characterization.

Analysis: Breaking material into parts and comparing or contrasting those parts. Analysis is the fourth level of Bloom's taxonomy, (knowledge, understanding, application, analysis, synthesis, evaluation). It enables a student to detect relationships among parts and the way they are organized.

Anticipatory Set: An activity designed to prepare the student for upcoming learning. Focus is provided on what is to be learned and previous learning/experience is tied to what is to be learned.

Application: Using appropriate generalizations and skills to solve a problem encountered in a new situation. The third level of cognition in Bloom's taxonomy (knowledge, understanding, application, analysis, synthesis, evaluation). Activities designed at the application level provide practice in the transfer of learnings.

"Birdwalking": To wander off the objective during teaching so that time is wasted and learners lose focus of the learning.

Bloom's Taxonomy: A classification of cognitive objectives into 6 levels: knowledge, understanding, application, analysis, synthesis, evaluation. Serves as a guide in writing objectives, diagnosing student behaviors, and planning activities to extend student thinking.

Check for Understanding: An overt activity in which the instructor ascertains to what degree the student comprehends the new instructional input/information.

Closure: Actively eliciting feedback from learners during appropriate intervals within the lesson in order to determine if learners grasped critical atributes of the learning. Closure is most appropriately used at the conclusion of an instructional objective. Closure can be achieved through Checking for Understanding.

Cognitive Domain: Refers to that area of student learning related to knowledge (knowledge of content, knowledge of concepts, knowledge of generalizations, and knowledge of processes).

Concept: A name for a class of objects or events Example: square is the concept name for any object having 4 equal sides and 4 right angles. A student understands a concept when she/he can discriminate between examples and nonexamples of the concept.

Condition: One component of a behavioral objective that defines that defines limitations, materials, or equipment utilized for instruction and practice during a lesson.

Congruent: Used to describe teacher action and decision when in agreement, harmony or correspondence to a selected objective.

Consequence: Anything not needed or desired by the learner. A consequence following an undesirable behavior may suppress that behavior.

Contaminator: Something that interferes or distracts from the learning; sometimes intentionally done to determine if learners can discriminate correct from incorrect information.

Covert Behavior: Student responses that are not observable. Thinking about the desired learning. This level of active participation takes less time than an overt response but it cannot be monitored by the teacher. Allowing time for covert behavior (thinking) can increase the quality of the overt response.

Critical Attribute: The unique characteristics or elements of a specific learning which make that learning separate and distinct from any other learning.

Diagnostic Survey: A method(s) of determining where a student's learning left off and new learning begins. May be informal (asking oral questions) or formal (written pretest). Usually designed from the task analysis (the sequential learnings leading to the final objective) using questions from easy to more difficult. Used to determine "correct level of difficulty".

Elements of Effective Instruction: A classification system of teacher decision making developed by Madeline Hunter. When teachers make consistent and conscious decisions during instruction, they increase the probability of student learning. The following are the four categories:

1. Select objectives near the correct level of difficulty
2. Teach to objectives
3. Monitor and make adjustments
4. Use principles of learning

Evaluation: The level of thinking at which a person makes a judgment based on sound criteria. There is no right or wrong answer. Evaluation is the sixth level of Bloom's taxonomy (knowledge, understanding, application, analysis, synthesis, evaluation). It involves a combination of all the other levels of the taxonomy.

Extinction: The absence of any reinforcers. To ignore behavior that has occurred results in reduction in the frequency of that behavior. A variable of reinforcement.

Extrinsic Motivation: A variable of motivation. Increases focus by using reinforcers (rewards) not related to the learning itself. Incentives for learning tasks are established by someone other than the learner. The child focuses on a task in order to receive a payoff Examples: doing task to earn a grade, points, star, etc.

Feeling Tone: The atmosphere or climate created by the teacher in the learning environment. Students interact in this environment according to their perceptions of the tone.

Goal: A subjective statement of what is desired (usually long range).

Guided Practice: During the lesson the student practices what has been taught with close teacher monitoring to catch any mistakes before students practice independently. It gives the students successful original learning, promotes retention, and allows the teacher to monitor.

Hemisphericity: Refers to the specialization of the right and left hemisphere of the brain. The left side processes information that is sequential or verbal. The right side processes spatial or visual information.

Individualized Instruction (personalized): Meeting the needs, interests, and abilities of learner.

Interest: Something vivid, different, or meaningful to the learner. One of the variables of motivation. When elements of a lesson are interesting it focuses the learner on the task.

Intrinsic Motivation: When the task is the reward itself for a learner, the learner is motivated to stay on task, i.e., a student reads a book because she/he loves to read. A variable of motivation.

Knowledge: The student recalls or recognizes information. The lowest or first level of cognition in Bloom's taxonomy (knowledge, understanding, application, analysis, synthesis, evaluation). The student needs information that she/he can recall before using that information at nigher levels of cognitive complexity.

Knowledge of Results: Providing the student with feedback about the adequacy of his/her response. This feedback should come immediately after student responses and it should be specific in terms of what the student has done well and what she/he might do to change. A variable of motivation. It helps students focus on the task when they know how well they are doing.

Learning: One component of a behavioral objective that defines the specific content component (information, skill, or process) taught in a lesson.

Learning Styles: An individual's way of acquiring and processing information and experience.

Lesson Plan Format: Step by step process for instruction, review, or diagnosis of a specific learning.

Level of Concern: The degree to which expectations are perceived by the learner. The level may be raised or lowered depending on the desired effect by the teachers.

Level of Difficulty: That the particular learning step being taken toward the objective is an achievable one by the learners--not an objective that is so difficult its achievement is impossible or one so easy it requires no learning effort or it has already been achieved.

Massed Practice: Short, intense practice periods which occur very often after new learning has been taught. Scheduling practice periods aids retention. Promotes fast learning during initial stages of learning.

Meaning: When new learning relates personally to the student in a language which is understood and is perceived as being of value to the student.

Meaningful Processing: Causing students to do more that just read or hear the material one more time. Having students actually demonstrate understanding or ability to apply information will promote retention.

Modeling: Teaching using visual-spatial activities. Will increase rate and degree of learning as well as retention. Learning acquired by modeling activities is processed in the right hemisphere of the brain.

Monitor and Adjust: A process whereby the teacher elicits overt behavior from the students, checks that behavior, interprets it, and decides on appropriate adjustments. Adjustments may be in terms of content, teacher presentation, or principles of learning. It is the third category of teacher decision making in the Effective Elements of Instruction. Allows the teacher to check on the learning of students and to change instruction appropriately (teaching diagnostically).

Motivation: Refers to the focus, attention, or persistence of student behavior. One of the principles of learning. Elements of motivation that can be used to increase focus are: success, knowledge of results, interest, level of concern, and intrinsic/extrinsic motivators.

Objective: The goal toward which teaching is directed. A clear statement the content, thought process, and behavior of the learner. It may also contain the conditions for testing and the performance level required.

Overt Behavior: An observable form of student involvement. One level of active participation. Overt behavior is elicited from students so the teacher can check for understanding, establish closure and provide knowledge of results (monitor student progress). It increases the learning by keeping students actively involved.

Performance Level: Minimum competency expectation to measure achievement of a given learning.

Positive Reinforcement: A strategy used to strengthen productive behavior or change non-productive behavior into productive behavior.

Post Test: Assessment of achievement at the end of a lesson.

Practice: An activity in which the learner develops proficiency by repeating an action. Practice may occur under the close supervision of the teacher (guided) or without supervision (independent).

Pre Test: A brief diagnosis before a lesson to determine if the learning is appropriate for the learners in the group.

Principles of Learning: Fundamental processes identified by psychologists that improve the efficiency of learning; e.g. motivation, retention, active participation, and reinforcement.

Proactive: A Brophy Characteristic factored out of the research to describe effective teachers. Refers to behavior initiated by the teachers themselves--in contrast to reactive behavior that less effective teachers exhibit in situations when students do something that forces them to make some sort of immediate reactive response. Proactive teachers predict possible undesirable situations or behaviors before they occur and attempt to solve or prevent them from occurring.

Psychomotor Domain: Refers to the area of student learning associated with the combined function of body and mind.

Retention: The act of remembering or retaining learning. One of the principles of learning. Variables affecting retention (discussed in this book) are: meaning, modeling, meaningful processing, and practice.

Schedule of Reinforcement: Refers to the relationship between the number of times a behavior occurs and the number of times it is reinforced. A regular schedule (reinforcement after every occurrence of the behavior) makes for fast learning. An intermittent schedule (reinforcing behavior periodically) makes the behavior more persistent and more resistant to forgetting.

Script Taping: A handwritten descriptive narrative of the lesson. It is an objective and non-evaluative technique for collecting observable descriptive data about teacher and student behavior.

Spouge Activities: Activities relevant to the objectives designed to enhance learning during slow or "wait" times.

Success: Refers to the feeling of achievement when one accomplishes a task. A variable of motivation. Success is more probable if tasks are set at the appropriate level of difficulty.

Synthesis: Refers to the putting together of parts into a whole using creative and original thinking. The fifth level of Bloom's taxonomy (knowledge, understanding, application, analysis, synthesis, evaluation). The student must draw upon elements from many sources and put them together into a pattern new to the learner.

Task Analysis: An identification of the sublearning necessary to accomplish a given objective. The process of task analysis involves breaking a learning down into enabling skills and knowledge, and sequencing the list. Can be used to diagnose for correct level of difficulty, as a guide in teaching to an objective, and for monitoring and adjusting.

Teach to an Objective: The part of the teaching-learning process in which the teacher chooses behaviors that are relevant to the intended objective. These behaviors (questions, directions, activities, explanations, responses to learner efforts) lead to the accomplishment of the objective and increase a student's time on task.

Transfer: Using previous or "old" learning in a new situation. Allows learners to build on and expand previous learning.

Understanding: Refers to the student grasping the meaning of the intended learning. This is the second level of Bloom's taxonomy (knowledge, understanding, application, analysis, synthesis, evaluation). Evidence of comprehension or understanding includes being able to translate the information into another form of communication, interpreting by summarizing, and extrapolating or predicting based on trends indentified.

ELEMENTS OF INSTRUCTION
REFERENCES

Blank, W. E. Handbook for Developing Competency - Based Training Programs. Prentice Hall, Englewood Cliffs, New Jersey 07632

Bloom, Benjamin S. Human Characteristics and School Learning. New York: McGraw-Hill Book Company, 1976.

Brandt, Ron. "On Teaching and Supervising: A Conversation with Madeline Hunter." Educational Leadership. 42:61-66, February, 1985.

Costa, Arthur L. and Robert Garmston. "Supervision for Intelligent Teaching." Educational Leadership. 42:70-80, February, 1985.

Cummings, Carol. Managing to Teach. Edmonds, Washington: Teaching, 1980.

Cummings, Carol. Teaching Makes a Difference. Edmonds, Washington: Teaching, 1980.

Eisner, Elliot W. "Can Educational Research Inform Educational Practice?" Phi Delta Kappan. 65:447-455, March, 1984.

Gage, N.L. "What Do We Know About Teaching Effectiveness?" Phi Delta Kappan. 65:87-93, October, 1984.

Gagne, Robert M. The Conditions of Learning. 3d ed. New York: Holt, Rinehart and Winston, Inc., 1977.

Hunter, Madeline. Improved Instruction. El Segundo, California: TIP Publications, 1976.

Hunter, Madeline. Motivation. El Segundo, California: TIP Publications, 1967.

Hunter, Madeline. Reinforcement El Segundo, California: TIP Publications, 1967.

Hunter, Madeline. Retention. El Segundo, California: TIP Publications, 1967.

Hunter, Madeline. Teach for Transfer. El Segundo, California: TIP Publications, 1967.

Hunter, Madeline. Teach More-Faster! El Segundo, California: TIP Publications, 1967.

Hunter, Madeline. "What's Wrong with Madeline Hunter?" Educational Leadership. 42:57-60, February, 1985.

Justiz, Manuel J. "It's Time to Make Every Minute Count." Phi Delta Kappan. 65:483-485, March, 1984.

Lambert, Linda. "How is Right - Madeline Hunter or Art Costa?" Educational Leadership. 42:68-69, February, 1985.

McCarthy, Bernice. The Four Mat System: Teaching to Learning Styles with Right/Left Mode Techniques. Arlington Heights, Illinois: Excel, Inc., 1980.

Phi Delta Kappan. January, 1985.

Raiche, Joseph J. School Improvement Research-Based Components and Processes for Effective Schools. Minneapolis: The Educational Cooperative Service Unit of the Metropolitan Twin Cities Area, 1976.

Ralph, John H. and James Fennessey. "Science or Reform: Some Questions about the Effective School Models." Phi Delta Kappan. 64:689-702, June, 1983.

Sutton, Jack. Teaching-Coaching-Supervising, Fall 1988, Volume 2, Number 1.

EVALUATION FORM

ELEMENTS OF INSTRUCTION WORKSHOP
March 7-9, 1989 MEAD INN - Wisconsin Rapids

Please rate the following and comment in your own word(s).

	Poor		OK		Great
1. Clarity and appropriateness of workshop objectives -	1	2	3	4	5

Comments: _____

_____

2. Applicability of Workshop Content - 1 2 3 4 5

Comments: _____

_____

3. Delivery of Information/Modeling - 1 2 3 4 5

Comments: _____

_____

4. Relevance of Activities - 1 2 3 4 5

Comments: _____

_____

5. Attention to Your Efforts - 1 2 3 4 5

Comments: _____

_____

6. Use of Principles of Learning - 1 2 3 4 5

Comments: _____

_____

7. What is the most significant thing you learned from the workshop?

_____

_____

8. Do you have suggestions that we should consider in planning the next workshop?

_____

_____

9. Your personal comments, suggestions and/or concerns:

_____

_____

Thinking it over ...

I learned:

I liked...

and I ...

I would have liked:

A problem I solved today was:

I would like to know more about:

I am: *optional*

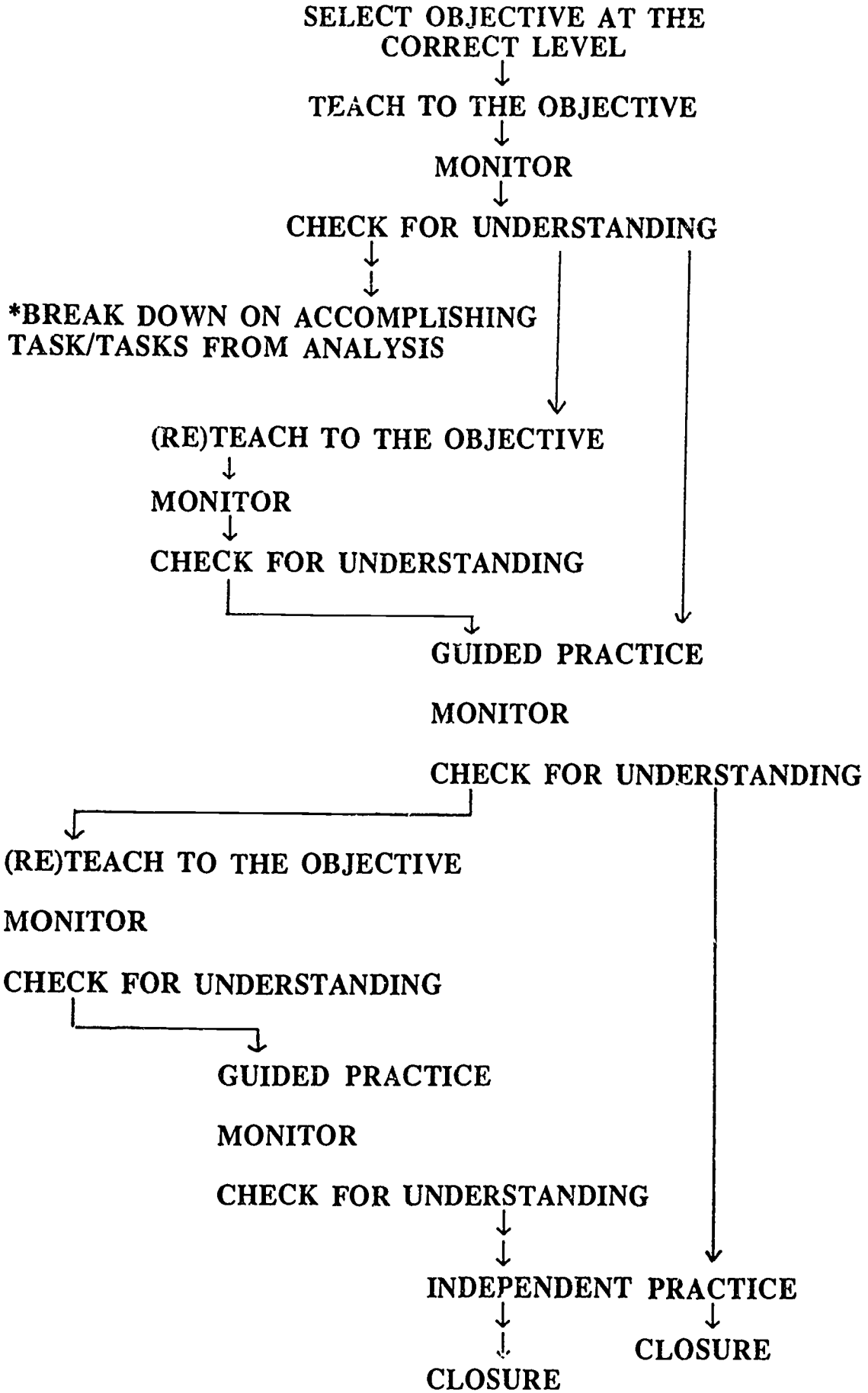
Name _____

School _____

I plan to:

Use reverse side for additional comments and suggestions. Thank you!

Adapted from a form developed by Sidney L. Hahn, University of Nebraska at Lincoln 1985


SELECT OBJECTIVE AT THE CORRECT LEVEL
TEACH TO THE OBJECTIVE
MONITOR
CHECK FOR UNDERSTANDING
*BREAK DOWN ON ACCOMPLISHING TASK/TASKS FROM ANALYSIS
(RE)TEACH TO THE OBJECTIVE
MONITOR
CHECK FOR UNDERSTANDING
GUIDED PRACTICE
MONITOR
CHECK FOR UNDERSTANDING
(RE)TEACH TO THE OBJECTIVE
MONITOR
CHECK FOR UNDERSTANDING
GUIDED PRACTICE
MONITOR
CHECK FOR UNDERSTANDING
INDEPENDENT PRACTICE
CLOSURE
CLOSURE

INDEPENDENT PRACTICE ASSIGNMENT

INPUT

MODEL

CHECK FOR UNDERSTANDING

GUIDED/MONITORED PRACTICE

INDEPENDENT PRACTICE

ANTICIPATORY SET

OBJECTIVE

CAUTION: Remember that not all elements need be present in every lesson.

Jot down examples from the lesson for...

Lesson Design

Set

Objectives

Input

Modeling

Checking for Understanding

Guided Practice

Independent Practice

Participation

Covert

Overt

Teaching to the Objective

What evidence do you have that the teacher did/did not teach to the objective?

Information

Responses to learner

Activities

Questions teach asks

Jot down examples from the lesson for...

Lesson Design

Set

Objectives

Input

Modeling

Checking for Understanding

Guided Practice

Independent Practice

Participation

Covert

Overt

Teaching to the Objective

What evidence do you have that the teacher did/did not teach to the objective?

Information

Responses to learner

Activities

Questions teach asks

Jot down examples from the lesson for...

Lesson Design

Set

Objectives

Input

Modeling

Checking for Understanding

Guided Practice

Independent Practice

Participation

Covert

Overt

Teaching to the Objective

What evidence do you have that the teacher did/did not teach to the objective?

Information

Responses to learner

Activities

Questions teach asks

Jot down examples from the lesson for...

Lesson Design

Set

Objectives

Input

Modeling

Checking for Understanding

Guided Practice

Independent Practice

Participation

Covert

Overt

Teaching to the Objective

What evidence do you have that the teacher did/did not teach to the objective?

Information

Responses to learner

Activities

Questions teach asks

LESSON DESIGN

The components for LESSON DESIGN are...

1.

2.

3.

4.

5.

6.

7.

8.

Each and every lesson does not contain all of the components of LESSON DESIGN. As the diagnostician the teacher determines which components are needed at what particular time in the lesson.

LESSON DESIGN

The components for LESSON DESIGN are...

1.

2.

3.

4.

5.

6.

7.

8.

Each and every lesson does not contain all of the components of LESSON DESIGN. As the diagnostician the teacher determines which components are needed at what particular time in the lesson.

LESSON DESIGN

The components for LESSON DESIGN are...

1.

2.

3.

4.

5.

6.

7.

8.

Each and every lesson does not contain all of the components of LESSON DESIGN. As the diagnostician the teacher determines which components are needed at what particular time in the lesson

LESSON DESIGN

The components for LESSON DESIGN are...

1.

2.

3.

4.

..

6.

7.

8.

Each and every lesson does not contain all of the components of LESSON DESIGN. As the diagnostician the teacher determines which components are needed at what particular time in the lesson.

Planning for Effective Instruction
(Lesson Design)

Doug Russell and Madeline Hunter

Planning is acknowledged to be one of the most influential factors in successful teaching. Should there be a system to this planning or does one hope for a burst of inspiration from which effective instruction will automatically flow? While the writers are all for inspiration, we agree with Edison, that a certain amount of well-directed "planning perspiration" will work wonders in increasing learners' successful achievement. We believe that a systematic consideration of seven elements, which research has shown to be influential in learning and which therefore should be deliberately included or excluded in planning for instruction, will make a great deal of difference in learners' success or lack of it.

It is assumed that before a teacher begins to plan for a particular day's teaching, the following steps, which make effective instruction possible, will have been taken:

A. Within each general content area, the teacher will have determined the particular strand for immediate diagnosing and teaching. For example, in the general content area of reading, the teacher might diagnose for and teach to inference skills.

B. The teacher will have identified a major target objective in that strand and have located students' educational positions in relation to that objective. For example, the teacher will identify which students can make only simple inferences and which can make more complex ones.

C. On the basis of the diagnosis, the teacher will have selected the specific objective for a particular group's daily instruction.

Now the teacher is ready to plan for that instruction regardless of whether the plan is implemented by input from the teacher, by materials or by the student him/herself.

For each instructional session, the teacher must consider the following seven steps separately to determine whether or not it is appropriate for the particular objective, for these students, and whether it should be included, excluded, or combined with a subsequent step. If the step is included, how to effectively integrate it into an artistic "flow" of instruction is the essence of the planning task.

1. Anticipatory Set

Anticipatory set is the result of an activity which occurs during the time that students are physically arriving or mentally "shifting" gears from the activity just finished. Anticipatory set elicits attending behavior (deliberate focus) and a mental readiness or "set" for the content of the ensuing instruction. Planning an effective activity to develop anticipatory set will

a. focus the students' attention,

b. provide a very brief practice on previously achieved and (if possible) related learnings and/or

c. develop a readiness for the instruction that will follow.

This anticipatory activity should continue only long enough to get students ready so that the major portion of instructional time is available for the accomplishment of the current objective.

Examples of activities that produce anticipatory set might be having students:

Give synonyms for common words, when the current objective is improvement in descriptive writing.

Create word problems to go with a numeral problem on the chalkboard when the current objective is computational practice.

Review the main ideas of yesterday's lesson which will be extended today.

State ways the new material might be useful in daily life.

Practice speedy answers to number facts for a quick review before today's math lesson.

2. The Objective and Its Purpose

This step involves teacher communication which informs the student what (s)he will be able to do by the end of instruction and why that accomplishment is important, useful and relevant to present and future life situations.

Examples:

"You were slowed down yesterday because you had trouble with _____. Today you are going to practice in order to develop more speed and accuracy."

"We are going to learn the correct form of letter writing so you can write for the materials you need in your social studies project."

"Today we are going to learn ways of participating in a discussion so we each get turns and learn from other peoples' ideas."

3. Instructional Input

To plan this step, the teacher must determine what information (new or already processed) is needed by the student in order to accomplish the present objective. Often students' are expected to achieve an objective without having been taught that which is necessary in order to do so.

Once the necessary information has been identified, the teacher must select the means for "getting it in the students' heads." Will it be by the teacher, a book, film, records, filmstrip, diagram, picture, real object, demonstration? The possibilities are legion.

Examples:

The teacher explains.

A film is used to give information or demonstrate an activity.

Students' use library resources.

Students' discover the information.

4. Modeling

It is facilitating for students' to not only know about, but to see examples of an acceptable finished product (story, poem, model, diagram, graph) or a process (how to identify the main idea, weave, articulate thinking while proceeding in the assignment, kick a ball).

It is important that the visual input of modeling be accompanied by the verbal input of labeling the critical elements of what is happening (or has happened) so students are focused on the essentials rather than being distracted by transitory or nonrelevant factors in the process or product.

Examples:

"I am going to use my thumb to work the clay in here like this so the tail has a firm foundation where it is joined by the body to the animal. In that way, it's less likely to break off."

"Watch while I do this problem and I'll tell you what I'm thinking as I work."

"Notice that this story has a provocative introductory paragraph that catches your interest by the first question the author asks."

5. Checking for Understanding

The teacher needs to check for students' possession of essential information and also needs to observe students' performance to make sure they exhibit the skills

necessary to achieve the instructional objective. This can be done by:

a. Sampling: Posing questions to the total group in order to focus them on the problem and develop readiness to hear the answer, then getting answers from representative members of the group.

b. Signaled responses from each member of the total group. Selecting 1st, 2nd, 3rd, 4th answer by showing that number of fingers, thumbs up or down for "agree" or "disagree," to the side for "not sure," raising hand when examples are correct, etc.

c. Individual private response, usually written or whispered to teacher so each student is accountable for demonstrating possession of, or progress toward achievement of the needed skills.

Examples:

"Signal me whether you 1) add, 2) subtract, 3) multiply, or 4) divide, by holding up that number of fingers."

"Thumbs up if what I say is correct; down if incorrect. Thumbs to the side if you're not sure."

"Raise your hand if you know the answer to this question."

"Write the names of the three important categories we have discussed."

"Do this problem on your paper."

6. Guided Practice

The beginning stages of learning are critical in the determination of future successful performance. Consequently, the students' initial attempts in new learning should be carefully guided so they are accurate and successful. Having instructed, teachers need to circulate among students to make sure the instruction has "taken" before "turning students' loose" to practice independently. The student needs to perform all (or enough) of the task so clarification or remediation can occur immediately as it is needed. In that way, the teacher is assured that students will be able to perform the task satisfactorily without assistance rather than practicing mistakes when working by themselves.

7. Independent Practice

Once the student can perform without major errors, discomfort or confusion, (s)he is ready to develop fluency by practicing without the availability of the teacher. Only then students' can be given a written or verbal assignment to practice the new skill or process with little or no teacher direction.

Simply "knowing" the seven steps in planning for effective instruction will not ensure that those steps are implemented with artistry. But, simply having an "artistic knack with kids" will not ensure the elements that promote successful learning are included in instructional planning. Both the science and the art of teaching are essential. It is the belief of the writers that deliberate consideration of the seven elements which can promote effective instruction constitutes the launching pad for student attainment in stratospheres of success never before thought possible.

ANALYSIS OF TEACHING

1. Did the teacher teach to an objective?
   Cite evidence: _____
   _____
   _____

2. Was the objective at the correct level of difficulty?
   Cite evidence: _____ _____
   _____
   _____

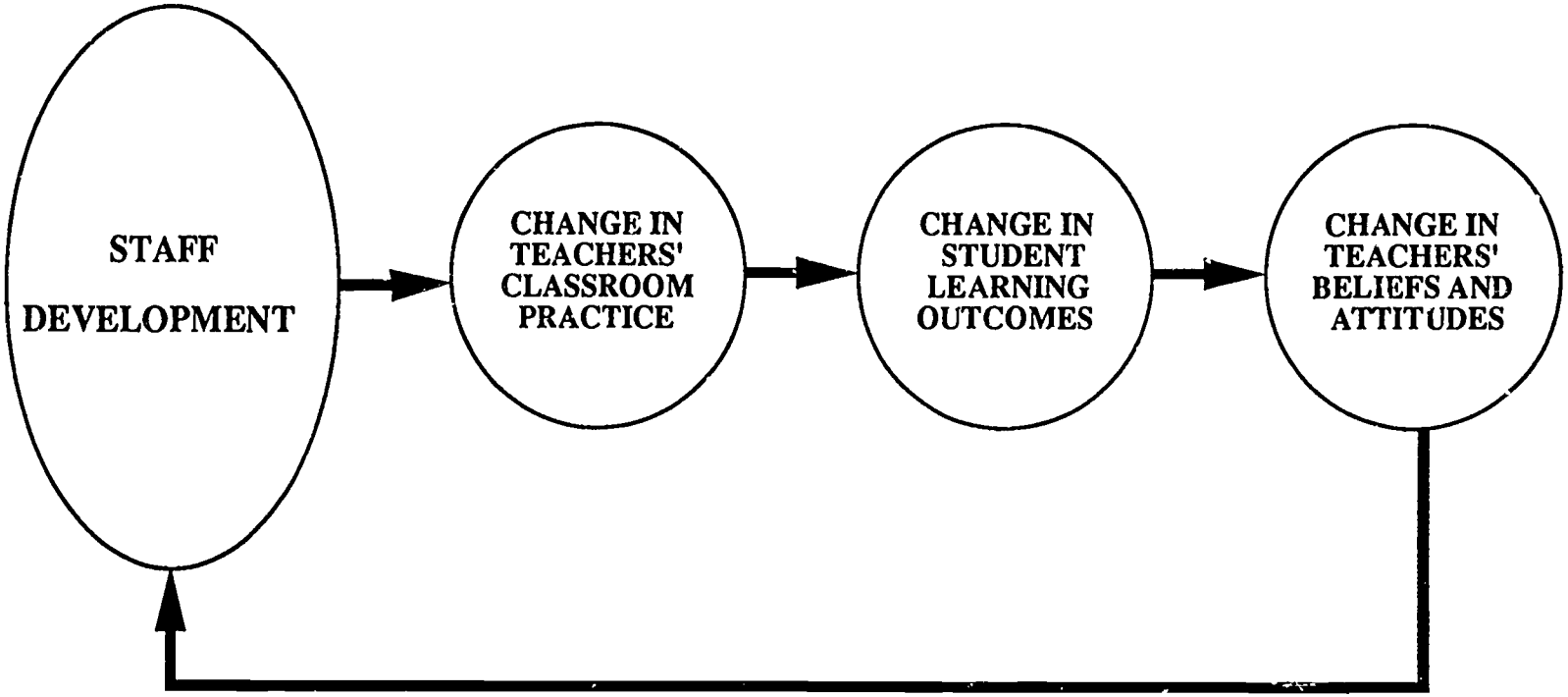
3. Did the teacher monitor the students and adjust the teaching?
   Cite evidence: _____
   _____
   _____

4. Did the teacher use the principles of learning?

   Cite evidence: _____
   _____
   _____
   _____
   _____

ATTACHMENT D

Transparency Masters


STAFF DEVELOPMENT
CHANGE IN TEACHERS' CLASSROOM PRACTICE
CHANGE IN STUDENT LEARNING OUTCOMES
CHANGE IN TEACHERS' BELIEFS AND ATTITUDES

A Research Based Process For Improving Instruction Focusing On Decisions And Actions of Teachers As They Plan And Conduct Instruction

SOME QUESTIONS. . .

- Why are you here?
- How will you benefit from being here?
- How will your students benefit from you being here?
- What should our objectives be?

196

STAFF DEVELOPMENT

(Generic)

An *ON-GOING PROCESS* which is *JOB RELATED* for the purpose of *MAINTAINING AND REFINING* the competence of district employees

PRINCIPLES OF LEARNING*

MOTIVATION	RATE & DEGREE	RETENTION	TRANSFER
Success Knowledge of Results Interest Feeling Tone Level of Concern Attribution	Meaning Participation Modeling Motivation (Intent) Reinforcement Set Transfer Practice Schedule Level of Aspiration Degree of Oringinal Guidance Hemisphericity Vividness Observation Knowledge of Results Learning Task Properties [Closure]	Meaning Degree of Original Learning Feeling Tone Practice Schedule Transfer	Past to Present Situation Identification of Similarity Degree of Original Learning Generalization Rules Probability Statements Critical Attributes Present to Future Situation Relationship of Similarity to Future Situation (Simulation) Degree of Original Learning Generalization Rules Probability Statements Critical Attributes

* UCLA Model

Training and Staff Development

An **on-going process** which is **job-related** for the purpose of **developing, maintaining and enhancing** instructional competence.

Training and Staff Development

An **on-going process** which is **job-related** for the purpose of **developing, maintaining and enhancing** instructional competence.

The probability that learning will occur improves to a great degree when reality of input, comfort, talk-communication, and feed back are present.

Leslie Hart

Promote Effective and Efficient Learning

(Apply Principles of Learning)

- Direct Mind of Learner on What is to be Learned (Focus)
- Foster Rate and Quantity of Learning
- Increase Probability of Retention of Learning
- Promote Transfer of Learning

UNCONSCIOUS INCOMPETENCE

CONSCIOUS INCOMPETENCE

UNCONSCIOUS COMPETENCE

CONSCIOUS COMPETENCE

LEARNING

A PROCESS BY WHICH ONE:

- Acquires Information
- Recognizes the Value of the information
- Intends to Act on the Information
- Acts on the Information

Ronald Lippit

ESSENTIAL ELEMENTS OF EFFECTIVE INSTRUCTION

- Select objectives at the correct level of difficulty.
- Teach to the objective
- Monitor and adjust
- Use principles of learning

"As a professional, you do not have the right not to know the body of knowledge related to your field".

Madeline Hunter

" TEACHING IS A STREAM OF DECISIONS, THE IMPLEMENTATION OF WHICH INCREASES THE PROBABILITY THAT LEARNING WILL OCCUR."

MADELINE HUNTER

TEACHING DECISIONS

- CONTENT
- DESIRED LEARNING BEHAVIOR
- TEACHING BEHAVIOR

Anticipatory Set

Anticipatory Set

The focusing of students on upcoming learning.

A. The activity designed to prepare students so everyone has the same opportunity to start at the same place.

B. An opportunity for the learner to bring forward prior knowledge or experience to the current learning situation.

Factors of Set

① Relate to the objective.

② Relate to the the past.

③ Actively involves the student.

When do we use Set?

① At the beginning of a lesson.

② After an interruption.

③ Change of objective.

Anticipatory Set - True or False Quiz

___ 1. Set is only to be used at the beginning of a lesson.

___ 2. Set must be relevant to the objective.

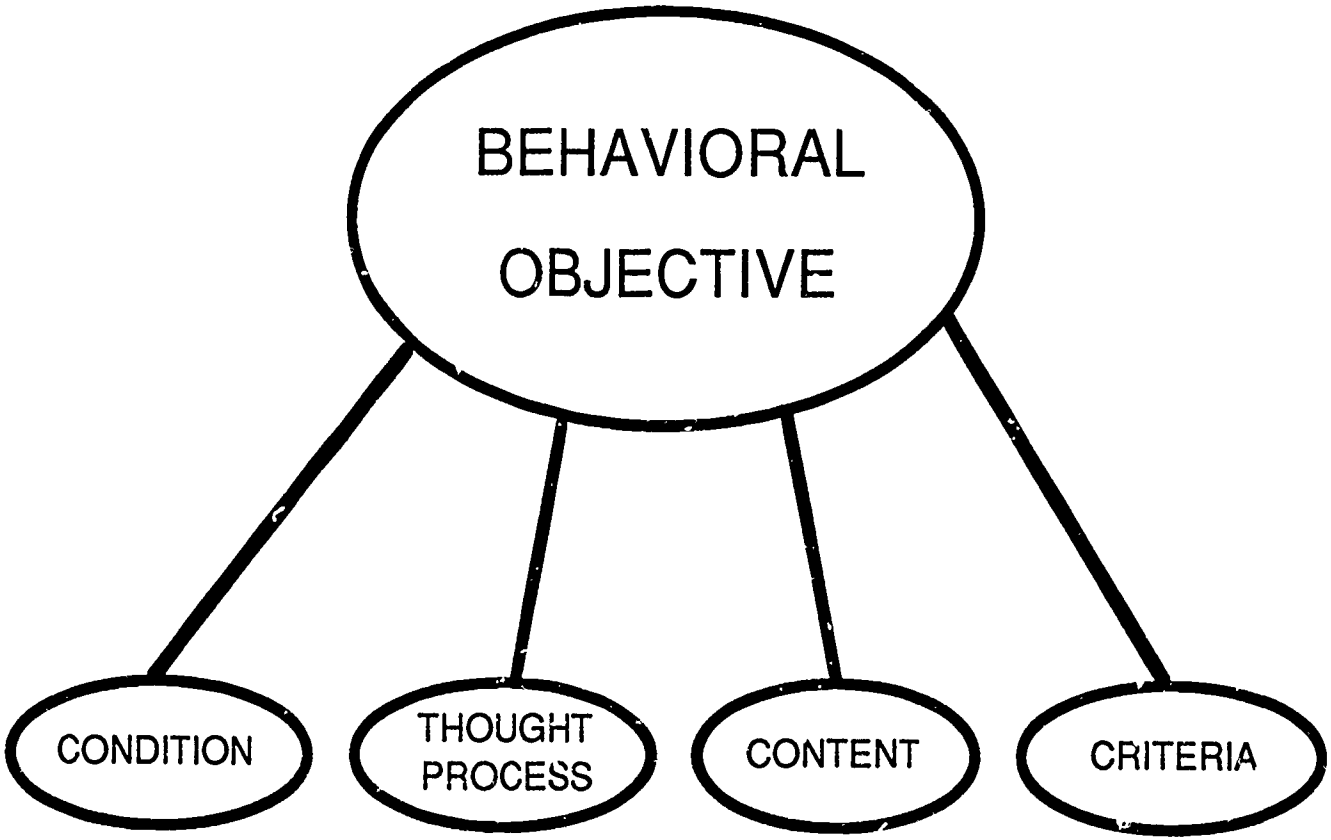
___ 3. Set involves only future learning.

___ 4. Active participation is a critical attribute of set.

___ 5. Set should be used with every lesson.

Selecting Objectives at the Correct Level

The decisions and actions of a teacher which **match** the learner to the task to be learned or outcome desired.


BEHAVIORAL
OBJECTIVE
CONDITION
THOUGHT
PROCESS
CONTENT
CRITERIA

LEARNING

Regarding Intuitive Teaching...

Good teachers don't violate the principles of learning. However, they may not be able to articulate or verbalize what they do.

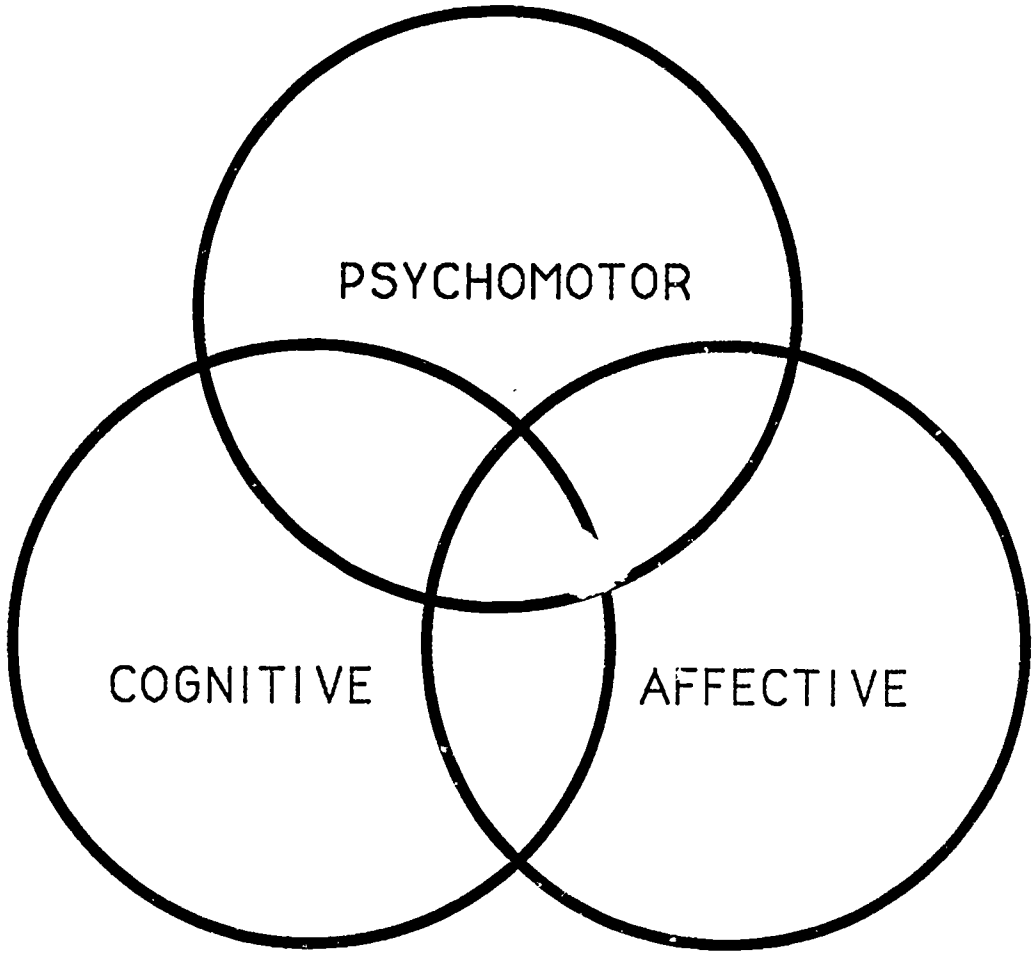
Madeline Hunter

OBJECTIVES

- Clarify and communicate what is expected
- Provide direction in selecting and organizing learning activities
- Form the basis for assisting student achievement

The difference between teaching and keeping school or supervising students while they learn, lies primarily in the use of [funded] knowledge to make learning or achievement of an educational goal, easier, more rapid, and more predictably successful for a student

Madeline Hunter


PSYCHOMOTOR
COGNITIVE
AFFECTIVE

AFFECTIVE

RECEIVING

RESPONDING

VALUING

ORGANIZATION

CHARACTERIZATION

COGNITIVE

KNOWLEDGE

COMPREHENSION

APPLICATION

ANALYSIS

SYNTHESIS

EVALUATION

PSYCHOMOTOR

PERCEPTION

SET

GUIDED RESPONSE

MECHANISM

COMPLEX RESPONSE

ADAPTATION

ORIGINATION

COMPLEXITY LEVELS OF BEHAVIOR

PSYCHOMOTOR **COGNITIVE** **AFFECTIVE**

CONTENT ANALYSIS

THE PROCESS OF IDENTIFYING WHAT IS TO BE TAUGHT

SELECTING OBJECTIVES AT THE CORRECT LEVEL

Decisions (By Instructor)

- Content Identification
- Difficulty Level of Content
- Complexity Level

Role Selection in Instructional Process

- Facilitator
- Guide
- Educator
- Trainer

CLINICAL TEACHING

SELECT OBJECTIVES AT THE CORRECT LEVEL

- Complete a Task Analysis of Content
- Translate Content Into Objectives
- Formulate Objectives
- Assess Learner Competence
- Plan Instructional Activities to Teach to the Objective

Teacher Actions

1. Provide Information

2. Ask Questions

3. Respond to the Efforts of the Learner

4. Design Activities

Teach to an Objective

The part of the teaching-learning process in which the teacher selects behaviors that are relevant to the intended goal.

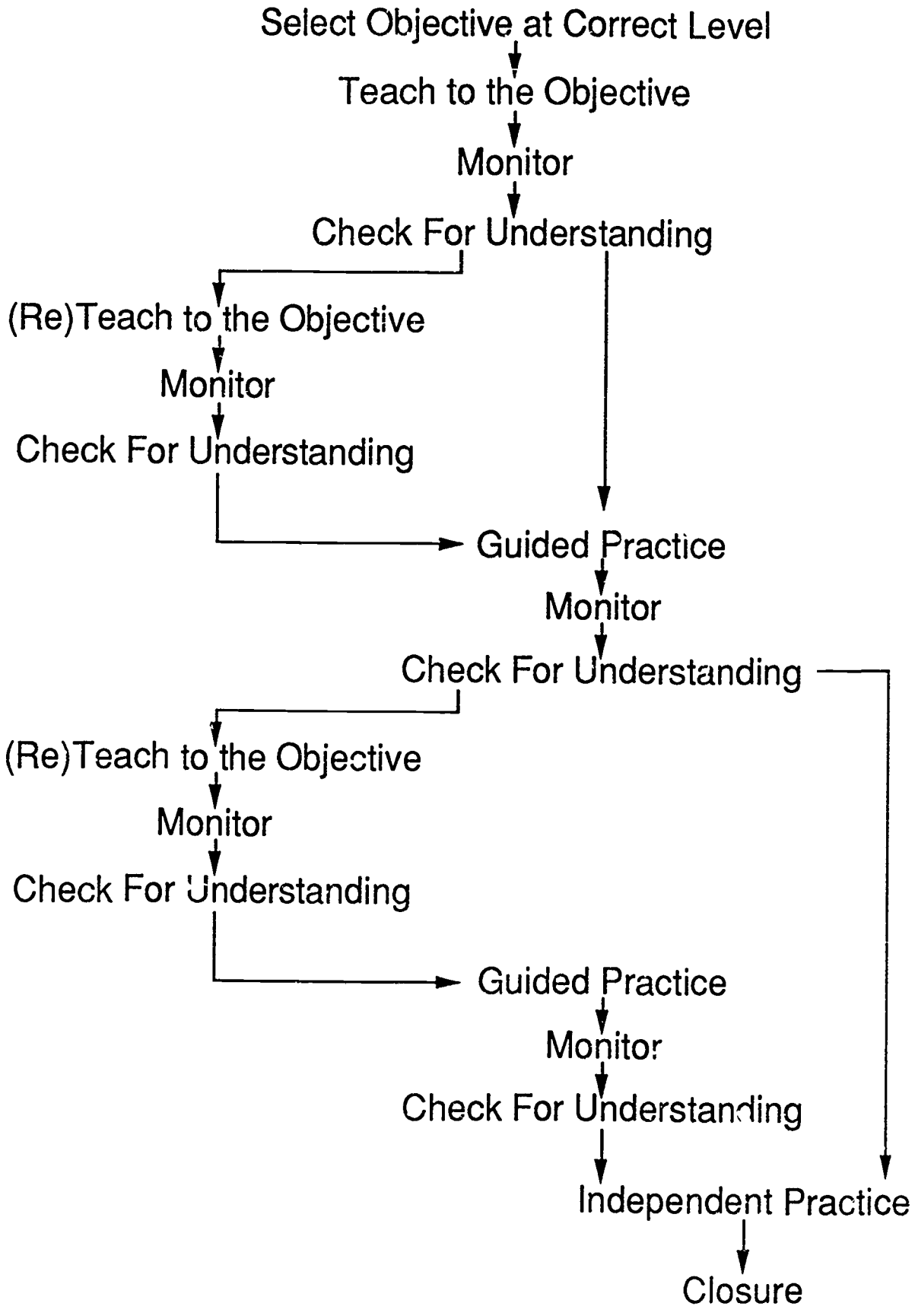
A. When teaching to the objective, the teacher's behavior matches what the students are to learn.

B. Once content for a lesson has been established, delivery of that content can be observed in the classroom.

Teach to an Objective

Teaching to an Objective Focuses the Teacher on the Behaviors that are Congruent to the Lesson.

Teach to an Objective



Teach to the Objective

The decisions and actions of a teacher in selecting congruent teacher and behaviors during an instructional episode.

Monitor and Adjust Helps the Student:

- With feedback on performance
- By increasing the rate and degree of learning
- By increasing retention
- By ensuring that the learning is at the correct level of difficulty

The function for the teacher with Monitor and Adjust is:

- Providing on going diagnosis
- Giving direction to future learning
- Helping the teacher meet the individual needs of students

A. Move On

B. Practice

C. Reteach

D. Abandon

Monitor and Adjust

The decisions & actions of a teacher to ascertain if learning is occurring as a result of appropriate teacher & learner behaviors.

It is not important for the teacher to teach the material, it is important for the student to learn it.

On going diagnosis is critical if teachers are going to monitor student progress and make effective instructional decisions.

Interpret the Behavior

A. There is no problem.

B. There is a problem with the task.

C. There is a problem with the teaching.

Who do teachers monitor?

Teachers afford fewer response opportunities to students perceived as low achievers.
High achievers initiate significantly more interactions with the teachers.

If teaching were the same as telling, think how smart we would be.

Learning is a *process* which can be *observed* and *evaluated* as it is taking place.

The apparent attention of the student is not a gauge to the learning process. Observers rated the students' apparent attention to the teacher and compared it with the testing of recall the next day. There was no correlation between apparent attention and learning.

Brothy and Evertson

Monitor and Adjust

The process whereby the teacher elicits an overt response from the student, checks that behavior, interprets it, and decides on appropriate adjustments.

1. Elicit overt response

2. Check the behavior

3. Interpret the behavior

4. Act on the interpretation

A TWO PART PROCESS

- KNOWLEDGE OF THE ESSENTIAL ELEMENTS OF INSTRUCTION INTERACTING WITH PRINCIPLES OF LEARNING

AND

- FOLLOW-UP ACTIVITIES DESIGNED TO PROVIDE FEEDBACK TO THE TEACHER REGARDING THE APPLICATION OF THE ESSENTIAL ELEMENTS OF INSTRUCTION IN A LIVE TEACHING EPISODE

Putting It All Together - Clinical

CHARACTERISTICS OF THE INSTRUCTIONAL IMPROVEMENT PROCESS

- Recognizes improvement as an on-going process
- Facilitates professional growth
- Provides consistent, relevant feedback
- Relates directly to "teaching" decisions and actions
- Focuses on elements of instruction that increase the probability that learning will occur
- Builds commitment to improve instruction
- Fosters relationships between staff and administration which are built on trust
- Recognizes research-based content as the foundation for planning instructional improvement
- Fosters instructor to instructor support for improving teacher action and decision making

Elements of Instruction

"Any growth demands a temporary loss of security... a period of creative floundering."

Madeline Hunter

The model is equally effective in elementary, secondary, and university teaching. In fact, it applies to every human interaction that is conducted for the purpose of learning.

Madeline Hunter

There are three things that can lead to success:

do what's right;

do the best you can;

treat others as you'd like to be treated.

There are three things that someone is always going to ask of you

can I trust you ?

are you committed to excellence ?

do you care about me ?

- Lou Holtz

"Teaching is a performance behavior.
It is not just a cognitive behavior.
To maintain and refine performance
requires guided practice."

Madeline Hunter

What do "good" teachers do when they demonstrate effectiveness ....

- in setting directions?
- in a teaching situation?
- in finding out where students are?
- in meeting the needs of the learner?

Excellent teaching is like an iceberg...

There is much more to it than appears on the surface.

Madeline Hunter

Competent people are those who can render valuable or worthy performance without using excessively costly behaviors.

Thomas Gilbert

We should not confuse the "plow" with the "crop".

(Behavior) (Accomplishment)

Thomas Gilbert

Check For Understanding

(of information)

Signaling

Choral Response

Sampling

"Say It To Yourself" and Be Prepared To...

Tell me and I will forget,

Show me and I might remember,

Involve me and I will understand.

Chinese Proverb

If....	*Then*
You want students to desire knowledge	Give them a reason
You want students to understand the content clearly and quickly	Define the concept
You want students to understand the immediate usefulness of that content	Let them try it themselves
You want that understanding to lead to a further and higher level questioning	Let the students create the questions

Effective Instructional Design Cannot Take Place Without the Designer Having a Basic Understanding of How the Human Being Learns.

Conceivably, if persons who have responsibility for designing instruction "know" how the brain works, they will be able to design instruction.

Conversely.....

Lesson Design

_ Anticipatory Set
_ Objective (Plan And Its Purpose)
_ Instructional Input
_ Model
_ Check For Understanding
_ Guided Practice
_ Independent Practice
_ Closure

ATTACHMENT E

Certificate of Completion

CVTAE
CENTER FOR VOCATIONAL TECHNICAL AND ADULT EDUCATION
715-232-1382

UNIVERSITY OF WISCONSIN
STOUT
MENOMONIE WISCONSIN 54751

March 16, 1989

It was a pleasure having you participate in the **Elements of Instruction VTAE Workshop** at Wisconsin Rapids, March 7-9, 1989. Summary of the evaluation results indicate the workshop was well received. We appreciate your many fine comments.

Enclosed is a certificate for your participation. You should be proud of your involvement in the Elements of Instruction Workshop and display this certificate and share this accomplishment with other teachers and students.

The follow-up **Instructional Supervision VTAE Workshop,** will be held March 28-30, 1989, at the Mead Inn - Wisconsin Rapids. This workshop is intended to develop supervision skills focused on instruction. Please confirm your attendance with your instructional services administrator. We will be calling the instructional servi administrators a few days before the workshop for a final count.

Those attending should bring and review the materials from the first workshop. Also, make your hotel reservations early.

Sincerely,

Howard Lee
CVTAE
(715) 232-2343

cc: Instructional Services Administrators

Enclosures

Elements of Instruction VTAE Workshop

Certificate of Completion

This is to certify that

Ron Sellnau

Participated in 18 hours of Instruction March 7-9, 1989, Wisconsin Rapids

Howard Lee, Instructor

Bill Mamel, Instructor

A project sponsored by the Wisconsin State Board of Vocational, Technical and Adult Education and the University of Wisconsin-Stout, Center for Vocational, Technical and Adult Education

ATTACHMENT F

Rating Scales

Center for Vocational Technical and Adult Education
Group numbers based on the PRIMARY group for this analysis
Analysis on 05-Apr-89 at 01:49 PM. Data from file: ELEML9
Survey analysis of response to 6 questions, by 15 people

==========
Question: 1
==========

Clarity and appropriateness of workshop objectives.
(1)=Poor (3)=OK (5)=Great

Group	Mean		Stand Dev		Number		Quartile			
	Omit	No Omit	Omit	No Omit	People	Checks	First	Median	Third	IQR
0	4.47	4.47	0.64	0.64	15	15	3.96	4.56	5.03	1.07

Omit	1	2	3	4	5	
0.00	0.00	0.00	0.07	0.40	0.53	People
0	0	0	1	6	8	

==========
Question: 2
==========

Applicability of Workshop Content
(1)=Poor (3)=OK (5)=Great

Group	Mean		Stand Dev		Number		Quartile			
	Omit	No Omit	Omit	No Omit	People	Checks	First	Median	Third	IQR
0	4.80	4.80	0.41	0.41	15	15	4.56	4.88	5.19	0.63

Omit	1	2	3	4	5	
0.00	0.00	0.00	0.00	0.20	0.80	People
0	0	0	0	3	12	

==========
Question: 3
==========

Delivery of Information/Modeling
(1)=Poor (3)=OK (5)=Great

Group	Mean		Stand Dev		Number		Quartile			
	Omit	No Omit	Omit	No Omit	People	Checks	First	Median	Third	IQR
0	4.53	4.53	0.64	0.64	15	15	4.05	4.67	5.08	1.03

Omit	1	2	3	4	5	
0.00	0.00	0.00	0.07	0.33	0.60	People
0	0	0	1	5	9	

Center for Vocational Technical and Adult Education
Group numbers based on the PRIMARY group for this analysis
Analysis on 05-Apr-89 at 01:49 PM. Data from file: ELEML9
Survey analysis of response to 6 questions, by 15 people

==========
Question: 4
==========

Relevance of Activities
(1)=Poor (3)=OK (5)=Great

Group	Mean		Stand Dev		Number		Quartile			
	Omit	No Omit	Omit	No Omit	People	Checks	First	Median	Third	IQR
0	4.87	4.87	0.35	0.35	15	15	4.63	4.92	5.21	0.58

Omit	1	2	3	4	5	
0.00	0.00	0.00	0.00	0.13	0.87	People
0	0	0	0	2	13	

==========
Question: 5
==========

Attention to Your Efforts
(1)=Poor (3)=OK (5)=Great

Group	Mean		Stand Dev		Number		Quartile			
	Omit	No Omit	Omit	No Omit	People	Checks	First	Median	Third	IQR
0	4.87	4.87	0.35	0.35	15	15	4.63	4.92	5.21	0.58

Omit	1	2	3	4	5	
0.00	0.00	0.00	0.00	0.13	0.87	People
0	0	0	0	2	13	

==========
Question: 6
==========

Use of Principles of Learning
(1)=Poor (3)=OK (5)=Great

Group	Mean		Stand Dev		Number		Quartile			
	Omit	No Omit	Omit	No Omit	People	Checks	First	Median	Third	IQR
0	4.67	4.67	0.49	0.49	15	15	4.25	4.75	5.13	0.88

Omit	1	2	3	4	5	
0.00	0.00	0.00	0.00	0.33	0.67	People
0	0	0	0	5	10	

ATTACHMENT G

Participant Comments

ELEMENTS OF INSTRUCTION WORKSHOP - March 7-9, 1989

1. All related to the objective of teaching.

1. Sections of material hard to sort. Need a clear break and a new title for each part.

1. They were identified for both overall and each day.

1. I was "lost" at first, but things really came together at the end.

1. Elements of instruction infused throughout.

1. Very good.

1. Day 1 initially blew my socks off. Day 2 a good recovery.

2. Also related to the objective of the workshop.

2. Just what I needed!

2. New thinking is uncomfortable - but vital.

2. Very good.

2. Some appropriate examples and framework to utilize in instruction.

2. Very useful.

2. A base line for unbiased observation at any level.

3. Excellent teaching models.

3. Bill and Howard are excellent models and presentors!

3. We moved very fast - I will need to do processing on my own.

3. Delivery - too fast in a few instances. Modeling great!

3. Sometimes the picture of what you want needs to be presented more or clearer.

3. You were excellent models for teaching.

3. One of best I've attended.

3. Organized and repeated.

3. Enthusiatic presentation.

4. On point.

4. Enjoyable and relevant!

4. Very relevenat.

4. Howard did a real good job with this.

4. All were congruent to the objectives the items built on the previous.

4. Learning must be fun, and it was.

4. Relevant for (1) establishing comfort and (2) reflecting on content and it's application.

4. Yes - certainly

4. Have lots of application very relevant.

4. Congruent!!!

5. All positive reinforcements criterions well handled.

5. Appreciate the help!

5. I worked on homework and on teaching assignment.

5. Day 1 I felt confused, disorganized, day two (post) I studied.

5. Not quite sure what you mean.

5. Positive reinforcement for involvement.

5. Positive reward certainly help my self-concept and impetus to using this information.

5. Good pcsitive feedback to student concerns.

6. Taught to the objectives of the workshop.

6. Observing others was good experience and helped me focus on them.

6. Workshop helped to organize some ideas.

6. Could have used some retention devices earlier; otherwise, correct!

6. Excellent.

6. You practice what you teach.

6. It got rushed at the end (and transfer was the most interesting topic for me).

6. Yes.

6. Very good - I learned a lot from them.

6. Time worked against you, but your level of concern high grade.

7. Give PEO time to answer.

7. Monetary and adjusting instruction.

7. Focusing on an objective and designing teaching experiences around it.

7. A better awareness and insight to some new elements of instruction. Especially in monitor/adjust interpreting the behavior.

7. Where to find additional materials to discover how important these workshops are.

7. A new way of organizing some principles and some new connections.

7. That there's a lot more I need to know.

7. To evaluate performance not content as an evaluator! To use more monitoring as a teacher!

7. Apply it.

7. That the "elements" take time (lots) to implement and not one is expecting perfection tomorrow.

7. How the model related to the role of the teachers as a "decision-maker".

7. Motivation - praising effort new idea to me and other many ideas.

7. New ideas which is what I always look for.

7. Build personal confidence in supervising areas not specifically trained in.

8. Begin not end with hints for remembering the material.

8. On the first day review/cover the material in the notebook. So, we have a reference we can use to look up things at night.

8. Have book a little better layed out.

8. Organize binders a bit better.

8. Reduce materials to the most significant content. Provide some materials prior to workshop.

8. Plan 1/2 hour to close rooms.

8. More time for interaction between and amoung prarticipants.

8. Make it open-ended, so everyone stays till you've covered everything as thoroughly as you and all participants want.

8. Continue to do what you have done.

8. No - you've thought of so much.

8. I would like to see the notes numbered and referred to. I spent a lot of time rifling through looking because I'm a poor notetaker and prefer preprinted.

8 Lay more groundwork prior to intro of Hunter model.

9. Thank you.

9. Two super instructors - I enjoyed it all. Thanks!

9. I had a super time and I feel the instructors made the whole course.

9. Bill and Howard compliment each other very well. I'd like a list of participants. Transfer is a very interesting topic but I think people were to restless to do it justice on Thursday afternoon.

9. I truly enjoyed the days after my initial unease and ego protection left which is to your credit!

9. Good

9. As I have learned the elements of instruction the instuctors have used them to present and facilitate the learning.

9. I enjoyed!

9. The two of you complimented each other; you were both organized and coordinated the effort -- not sets of disjunctive content or activities. Thanks.

9. Keep it up - positive approaches to instruction, great.

9. One of the better workshops that I've attended and I'm anxious to get to the application stage.

9. Learned much...looking forward to next session.