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ABSTRACT

The document recounts in a narrative scenario how fictional nursing teachers and a consultant in a work-session developed a matrix which helped the teachers organize their clinical nursing courses more effectively by discriminating carefully among knowledge, performance, and attitude objectives. Placing the objectives on the matrix revealed the degrees to which the courses were balanced. Concise language was encouraged in a series of Socratic exchanges. The document is titled "illustrated" because, in itself, it illustrates what a learning module should be, or, serves as a model, in which the reader may discern by analysis the components of a successful module. There are no illustrations in the usual sense of graphic embellishment, nor are there explicit instructions provided on developing a learning module, beyond the note that a module contains objectives, pretests, learning environments, and post-tests, just as the document does. The reader is pretested and post-tested on his knowledge of the matrix-development scenario. Thirty-two pages of the document are devoted to sample nursing education course objectives, and one completed matrix is provided for barbers. Implications for career ladders and lattices must be drawn by the reader. (AJ)

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TITLE

AN ILLUSTRATED SELF-EVALUATIVE
HOW TO DO IT KIT
ON DEVELOPING FAIL-SAFE, STUDENT-PACED,
INDIVIDUALIZED LEARNING MODULES
FOR OCCUPATIONAL EDUCATION
CAREER LADDERS AND LATTICES
(WORK SESSION 1)

U.S. DEPARTMENT OF HEALTH,
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AN ILLUSTRATED SELF-EVALUATIVE HOW TO DO IT KIT ON DEVELOPING FAIL-SAFE,
STUDENT-PACED, INDIVIDUALIZED LEARNING MODULES FOR OCCUPATIONAL EDUCATION
CAREER LADDERS AND LATTICES (WORK SESSION I)

Illustrated

This document is ILLUSTRATED in the sense that it tries to practice what it teaches. This document teaches that a module is composed of four components: objectives, pretests, learning environments, and posttests. Thus, objectives are found on page I. Pretest items are found on page III. Learning environments are found on page IV. Posttest items are found on page V. In addition, each of these pages indicated by Roman numerals provide a cross-section analysis of the entire work and its contents.

Self-Evaluation

This document is SELF-EVALUATIVE because it provides a number of diagnostic and mastery testing instruments. For example, a diagnostic instrument is found beginning on page 33. A mastery instrument is found beginning on page 36.

How to Do It Kit

This document is a HOW TO DO IT KIT because the narrative format of work section I tries to give the typical scenario between the educator and the consultant explaining the module system. This question and answer format is intended to simplify the process of developing modules. As a result of going through this scenario dialogue, the educator should be able to develop modules in a reasonable period of time. As a unifying theme, the career path proposed in this document is a combination of an upward career ladder and a sideways career lattice that gives every individual the maximum opportunity for advancement and variety in an interesting and challenging occupation.

THE PURPOSE OF THIS WORKSHOP

The purpose of this workshop is to develop objectives in the clinical situation.

The traditional approach to nursing education has been to stress procedures. These procedures involve step-by-step learning techniques. Sometimes, the student thinks that because step A, step B, and step C have been learned that there is no other way to do it. This implication may have been inspired by the obvious fact that teachers sometimes teach only one way to do a specific procedure.

By making the transition from the procedures' approach to the principles' approach, the nursing educator sets up objective standards. An example of an objective standard would be asepsis or sterile technique. After the teacher has zeroed in on asepsis as the purpose of a particular lesson, it is made clear to the learner that there are many ways to achieve asepsis or sterile technique.

This transition from procedures to principles can be called problem solving in action. The learner is made aware that there are many ways to achieve a specific result such as asepsis. In addition, the learner is prepared for changes and new discoveries that will directly influence the step-by-step accomplishment of asepsis in the future.

In this way, new developments in sterile technique will be incorporated into the learners professional functioning on the job. Similarly, even new discoveries in the area of germ theory will not be seen as a contradiction but as a continuation of the principles absorbed in learning.

In order to achieve this purpose of developing objectives based upon principles rather than upon procedures in the clinical area, it is necessary to spell out the first two steps:

STEP 1

The fundamentals course will be operationally defined in terms of objectives that center around such topics as asepsis, observation of patient, and communications in a functional job rather than around traditional subject matter.

STEP 2

These principles will be learned in clinical specialty areas: such as med-surg and maternal-child health.

While the primary focus of this workshop will be on overall objectives, evaluations and resources will be integrated into the workshop in order to provide nursing educators with usable yardsticks and with relevant technology.

Recognized nursing procedures will be prescribed since most of these techniques have stood the test of time. There are only so many professionally acceptable techniques. However a wider variety of teaching methods will be used to achieve these acceptable procedures in light of indepth principles.

1. DEVELOP OBJECTIVES-in the clinical situation

- A. Principles: (A. Objective standards) → Zero in on the purpose
(B. Many ways to get there)
- B. Procedures: (A. Step-by-step: A,B,C) → Teach one way, step by step
(B. The way to do it)
- C. Problem Solving in action:
(A. Many ways to do it) (Asepsis)
(B. New discoveries) (Advances)

2. OVERALL OBJECTIVES:

- A. Evaluation: From test and measurement to observation
- B. Resources: Media, technology

3. NEEDS:

- A. Clinical Specialty Area: Med-Surg, Maternal-Child Health
- B. Fundamentals: Asepsis, Observation of Patient, Communications in a Fundamental Job

4. LENGTH:

HOW MANY:

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OBJECTIVES FOR WORK SESSION I

As a result of work session I, participants will be able to organize existing materials, fill-in a matrix completely and accurately, and improve upon existing materials and matrices.

These objectives can be subdivided into: Knowledge Objectives (KO), Performance Objectives (PO), and Attitude Objectives (AO). These three objectives can be summarized as:

- KO: ORGANIZE existing materials
- PO: FILL-IN a matrix completely and accurately
- AO: IMPROVE upon existing materials and matrices

An overview of work session I is provided on page 10 which furnishes a matrix. The KO, PO, and AO components of this matrix on page 10 have been explained above.

This matrix also contains Knowledge Evaluations (KE), Performance Evaluations (PE), and Attitude Evaluations (AE). These matrix components can be used to come up with appropriate yardsticks for knowledge, performance, and attitude.

The matrix on page 10 also contains Knowledge Resources (KR), Performance Resources (PR), and Attitude Resources (AR). These matrix components provide a number of different learning activities and environments that can serve as resources for knowledge, performance, or attitude.

Careful analysis of page 10 reveals that each matrix component is cross-referenced to a specific page or pages in work session I. These cross-references can serve as an index to work session I.

PRETEST FOR WORK SESSION I

Pages 33 and 34 of this document contain a pretest for work session I.

This pretest is a very simple way to preview the material covered in work session I. Since there is a wide variety of materials in work session I, it is to the advantage of the reader to be aware of how all the pieces fit together.

Several readers have become familiar with the ideas contained in work session I. These readers who find the pretest very simple and obvious should go directly either to the LEARNING ENVIRONMENT FOR WORK SESSION I or to the POSTTEST FOR WORK SESSION I.

One of the outcomes of work session I is the ability to plan and develop units or modules of instruction. These units or modules of instruction will be fail-safe in the sense that each learner can obtain success since failure is almost impossible. These units or modules will be student-paced in the sense that each learner can proceed at an individualized speed or rate of mastery.

In order to develop fail-safe student-paced modules, the teacher needs a lot of practice in analyzing, organizing, and balancing existing materials. This analysis, organization, and allocation of resources is the outcome desired by work session I.

Going through the pretest can help the reader determine individual stages of readiness for this task.

LEARNING ENVIRONMENT FOR WORK SESSION I

The following materials contained on pages 1 to 32 can be interpreted in a large sense as a good learning environment for work session I. This means that the learner should read the material carefully and try to understand the message.

Reference back to the pretest and the posttest can also serve as spurs to learning.

The theory behind this presentation is translated into practical examples on pages 1 to 10.

Pages 1 to 11 provide various samples of products that can result as the outcome of work session I.

Pages 18 to 32 provide objectives, evaluations, and learning resources that are cross-referenced into a matrix format.

Going through this material carefully should give the learner the basic principles in the format of practical suggestions and examples that can be easily implemented elsewhere.

POSTTEST FOR WORK SESSION I

Pages 36 and 37 of this document contain a posttest for work session I.

This posttest is a very simple way to verify mastery of the objectives spelled out on page ii.

The true-false questions on pages 36 and 37 provide a rapid overview of the content.

The performance evaluation items, on page 37 give a better idea of progress made as a result of using this material.

The successful learner will be able to do the following as a result of mastering the objectives of this module :

DEVELOP a module with

- (a) OBJECTIVES
- (b) PRETEST
- (c) LEARNING ENVIRONMENTS
- (d) POSTTEST

in such a way as to

DOCUMENT learner success directly due to this fail-safe and student-paced learning module.

1

WORK SESSION I
A TYPICAL SCENARIO

CGA: Where do you want to begin organizing for a module?

RN: With my 100 pages of notes?

CGA: Start with only 1 page.

RN: Which one?

CGA: It's up to you.

RN: Let's start with blood pressure.

CGA: OK. Start with the first sentence.

RN: I'm going to teach blood-pressure.

CGA: Do you want teacher-centered or learner-centered modules?

RN: Learner-centered, so I guess I should say, "Students will learn b.p."

CGA: Do the students talk or listen?

RN: They listen.

CGA: Why not say, "listen" instead of "learn."

RN: Students listen to a lecture about b.p.

CGA: Is that an objective, evaluation, or resource?

RN: An objective.

CGA: Do you really want the critical minimum behavior to be "listening?"

RN: No, listening is a means to get to the objective.

CGA: That's what we call a resource.

RN: What kind of resource?

CGA: What do you think?

RN: What choice do I have?

CGA: KR (KNOWLEDGE RESOURCES),
PR (PERFORMANCE RESOURCES), or
AR (ATTITUDE RESOURCES).

RN: I think all three, KR, PR, and AR!

CGA: Why KR?

RN: When learners listen to theory and principles, it's
KR or KNOWLEDGE RESOURCES.

CGA: Why PR?

RN: When I spell out clinical procedures, it's PR or
PERFORMANCE RESOURCES.

CGA: Do you stress hands on procedures in PR?

RN: Yes, sometimes I show what to do so the learners can imitate.
I mean that learners can imitate what they observe.

CGA: Listening to hands on procedures can be PR.

RN: Why do you say, "can be"?

CGA: Because watching procedures to be imitated is an even better PR.

RN: Why?

CGA: KR is knowing or remembering.
PR is doing or performing.

RN: I see!

CGA: Why AR?

RN: When we discuss good attitudes, it's AR or ATTITUDE RESOURCES.

CGA: You see, you're already:
(a) going beyond telling or showing for AR, and
(b) becoming more learner-centered.

RN: Well, I'm starting to see the light.

CGA: Keep it up.

RN: What do I do with all my paper and pencil tests?

CGA: Are they objectives, evaluations, or resources?

RN: Evaluations!

CGA: KE (KNOWLEDGE EVALUATIONS),
PE (PERFORMANCE EVALUATIONS), or
AE (ATTITUDE EVALUATIONS)?

RN: Strictly speaking, KE or KNOWLEDGE EVALUATIONS.

CGA: Mark "Pass paper and pencil tests" in the KE component of the matrix.

RN: Do you mean, "Pass out paper and pencil tests?"

CGA: No. "Pass" is what the learner does after he succeeds on an exam.

RN: That's right. A matrix is learner-centered, but what about checklists I fill out.

CGA: Where do you fill out these checklists?

RN: In the clinic during learner evaluation.

CGA: Are you evaluating knowledge, performance, or attitude?

RN: Performance.

CGA: Then, that means?

RN: PE or PERFORMANCE EVALUATION.

CGA: Right!

RN: How do I evaluate attitudes?

CGA: That's a tough question!

RN: What should I do?

CGA: What do you do?

RN: That's easy. The learners keep a diary of daily reactions, emotional and judgmental!

CGA: How do learners use the diary?

RN: Sometimes, we use it to measure the progress learners have made since the first month in the clinic.

CGA: Which component is that?

RN: I'm not sure.

CGA: Is it K or KNOWLEDGE?
P or PERFORMANCE? or
A or ATTITUDE?

RN: It's A or ATTITUDE!

CGA: Is it O or OBJECTIVES?
E or EVALUATIONS? or
R or RESOURCES?

RN: Since we measure, it's AE or ATTITUDE EVALUATIONS.

CGA: What else do you do with the attitude diary?

RN: We discuss the diary entries to pick up realistic values from one another and professional peers.

CGA: Is that AE or AR?

RN: Well, since AE means ATTITUDE EVALUATIONS and AR means ATTITUDE RESOURCES, this discussion would seem to be AR.

CGA: I agree.

RN: How does all this refer to the matrix?

CGA: Let's fill in what you've said so far!!!

RN: Let me do it!!!

CGA: OK. That's the way it should be.

RN: Here's how I sum up what the learner should demonstrate:

KO	PO	AO
KE <u>Pass</u> paper and pencil tests	PE <u>Merit</u> "pass" on pass/fail clinical checklist ratings from supervisors	AE <u>Measure</u> personal and group progress since the first month in the clinic
KR <u>Listen</u> to lecture on blood pressure	PR <u>Act out</u> the procedures <u>Imitate</u> the instructor's demonstration of how to take a blood pressure	AR <u>Weigh</u> what the instructor presents as a good attitude <u>Discuss</u> good attitudes in group setting <u>Keep</u> a diary of emotions and judgments <u>Pick up</u> realistic values from peers

CGA: How do you like it?

RN: It's easier than I had expected. Am I done?

CGA: Do you see any empty components?

RN: Yes. KO, PO, AO. Do I fill them in?

CGA: Yes.

RN: Where do I start?

CGA: Wherever you want.

RN: After that, what do I do?

CGA: You pick your brain for other ideas that pop up as you reread the matrix.

RN: How's this as a filled in matrix?

<p>KO</p> <p><u>Read</u> the b.p. instruments properly</p>	<p>PO</p> <p><u>Take</u> the b.p. of a clinical patient</p>	<p>AO</p> <p><u>Treat</u> the patient professionally and humanely</p>
<p>KE</p> <p><u>Pass</u> paper and pencil tests</p> <p><u>Explain</u> each procedure to instructor's satisfaction</p>	<p>PE</p> <p><u>Merit</u> "pass" on pass/fail clinical checklist ratings from supervisors</p> <p><u>Place</u> the cuff properly</p>	<p>AE</p> <p><u>Measure</u> personal and group progress since the first month in the clinic</p> <p><u>Set</u> the patient at ease during and after b.p.</p>
<p>KR</p> <p><u>Listen</u> to lecture on blood pressure</p> <p><u>Interact</u> with AV media on b.p.</p>	<p>PR</p> <p><u>Act out</u> the procedures sheet</p> <p>Imitate the instructor's demonstration of how to take blood pressure</p>	<p>AR</p> <p><u>Weigh</u> what the instructor presents as a good attitude</p> <p><u>Discuss</u> good attitudes in group setting</p> <p><u>Keep</u> a diary of emotions and judgments</p> <p><u>Pick up</u> realistic values from peers</p>

CGA: Can you still improve this matrix?

RN: Yes.

CGA: Then, keep on revising.

RN: Where?

CGA: Where are you most interested?

RN: In the attitudes and performances!

CGA: Only one at a time!

RN: OK, then, attitudes!

CGA: Where in attitudes?

RN: How do I influence values?

CGA: How about conditions, consequences, and modeling?

RN: What's modeling?

CGA: A fancy name for premeditated good example.

RN: Is that all?

CGA: It's easy to insert in the matrix.
The hard part is doing it with restless learners.

RN: What are the conditions I can influence?

CGA: Conditions refers to "setting the stage."

RN: You mean like flowers?

CGA: Yes, but what do you do when the florist is closed?

RN: We dress neatly.
Only the competent get to wear the cap.

CGA: That's the way.
I supply the matrix.
You fill in only the best details.

RN: What do you mean by consequences?

CGA: Did you feel better when you filled in the matrix for the first time after only 10 minutes of training?

RN: Yes, so consequences should include feelings of success.

CGA: Yes, and a chance to practice!

RN: Is that why we went to examples immediately?

CGA: Yes. Even teachers don't like to sit back and be talked to like tape recorders.

RN: Now, I see what you mean!

CGA: The important thing is to practice.

RN: Is that enough?

CGA: Yes, if you're motivated.

RN-2: I don't see any sense in the matrix.

CGA: Tell me more.

RN-2: Everything in the matrix was already in my head.

RN-1: But, now it's on paper and open for all to see.

CGA: Remember, the matrix is a tool not a POLICY or EDICT....

RN-3: The matrix developed so far isn't what I want at all.

RN-1: What do you want?

RN-3: I want more emphasis on performance testing.

CGA: You want more PE!!!

RN-2: So do I, along with more practical procedures sheets.

CGA: You want more PR!

RN-1: But, my emphasis was on attitudes since I can buy KO and KE from texts and various associations.

CGA: These sources for KO and KR belong in the matrix so other teachers can use them.

RN-3: How can we squeeze all that PE into a tiny rectangle?

CGA: You don't.

RN-2: What do I do?

CGA: Don't throw away detailed clinical evaluation, but organize it to make sure your total program is balanced.

RN-1: So that's what you mean by organize. We use the matrix to X-RAY and ORGANIZE but not to REPLACE existing materials.

CGA: Yes, balance your program on the one page matrix before investing a lot of time, effort, and money in a lopsided module.

Let's sum up work session I in a matrix x-ray.

Then, we can look at the questions ~~that~~ need to be answered to fill in the typical matrix (page 11).

After that, we can discuss three sample matrices (pages 12-14).

This should get us ready for a typical x-ray result (pages 15-61) and for an objective to place on the matrix (page 17).

MATRIX X-RAY OF
WORK SESSION I

<p>KO</p> <p><u>Organize</u> existing materials (pp. 8-9)</p>	<p>PO</p> <p><u>Fill in</u> a matrix completely and accurately (p. 6)</p>	<p>AO</p> <p><u>Improve</u> upon existing materials and matrices (p. 7)</p>
<p>KE</p> <p><u>Execute</u>: sort 1 (K? P? A?) sort 2 (O? E? R?) (pp. 3-4)</p> <p><u>Improve</u> the matrices of colleagues (pp. 12-13)</p>	<p>PE</p> <p><u>Translate</u> personal opinion evaluations into checklists that are open for discussion (p. 3)</p> <p><u>Borrow</u> ideas from fellow teachers in different disciplines (p. 14)</p>	<p>AE</p> <p><u>Check</u> to make sure that the learner is the center (p. 1)</p> <p><u>Apply</u> the matrix x-ray for immediate results and benefits (pp. 15-16)</p>
<p>KR</p> <p><u>Define</u> terms taken for granted, for example, "talk = teach" or "listen = learn" (pp. 1-2)</p> <p><u>List</u> currently available objectives, evaluations, and resources (p. 5)</p>	<p>PR</p> <p><u>Distinguish</u> operationally: (a) knowing from remembering (b) knowing from doing (pp. 2-3)</p> <p><u>Practice</u> the matrix "two step" (p. 11)</p> <p><u>Say</u> more in fewer words (p. 17)</p>	<p>AR</p> <p><u>Start</u> where most comfortable and with familiar activities (p. 1)</p> <p><u>Influence</u> values by: (a) conditions (b) consequences (c) modeling (p. 7)</p> <p><u>Practice</u> what is recommended for others (p. 10)</p>

The MATRIX "TWO STEP"

Step 1: Teachers answer these questions orally, at great length, in a group discussion setting.

Step 2: Teachers boil down the answers to a one page matrix.

<p>KO</p> <p>What should students know as a result of this learning matrix?</p> <p><u>Knowledge Objectives</u> (Targets)</p>	<p>PO</p> <p>What can students do now to apply this knowledge?</p> <p><u>Performance Objectives</u> (Targets)</p>	<p>AO</p> <p>What attitudes help students most in learning and in applying all this?</p> <p><u>Attitude Objectives</u> (Targets)</p>
<p>KE</p> <p>How can the successful learner be distinguished from the unsuccessful student?</p> <p><u>Knowledge Evaluations</u> (Tests)</p>	<p>PE</p> <p>How can students themselves distinguish between the various degrees of hands on success?</p> <p><u>Performance Evaluations</u> (Tests)</p>	<p>AE</p> <p>How can subjective attitude evaluation be made less subject to individual whim and prejudice?</p> <p><u>Attitude Evaluations</u> (Tests)</p>
<p>KR</p> <p>What has worked in getting these goals across to students?</p> <p><u>Knowledge Resources</u> (Technology)</p>	<p>PR</p> <p>What can be done to get students to perform on their own in real life settings?</p> <p><u>Performance Resources</u> (Technology)</p>	<p>AR</p> <p>What can students do together to develop the give-and-take necessary to foster good attitudes?</p> <p><u>Attitude Resources</u> (Technology)</p>

BEGINNING COURSE
MATRIX

<p>KO</p> <p>Visualize expectations Preview course outline</p>	<p>PO</p> <p>Familiarize self with <ul style="list-style-type: none"> •hospital •data •procedures •profession <p>Work with patients in an institutional or clinical setting</p> </p>	<p>AO</p> <p>Analyze grading system Choose from a variety of learning tools</p>
<p>KE</p> <p>Problem solve List information services</p>	<p>PE</p> <p>Ask questions Procure course outline</p>	<p>AE</p> <p>Meet ethical standards Give humane care</p>
<p>KR</p> <p>Locate help and supplies</p>	<p>PR</p> <p>Go through typical procedures Operate machines</p>	<p>AR</p> <p>Experience patient needs Determine nursing implications</p>

Livening Up an Anatomy Unit

<p>KO</p> <p><u>Name</u> the bones of the skull</p> <p><u>Recognize</u> medical terminology in MD's orders, both oral and written</p>	<p>PO</p> <p>As a nurse</p> <p>In a clinical setting</p> <p><u>Care</u> for the patient</p>	<p>AO</p> <p><u>Act</u> friendly</p> <p><u>Act</u> enthusiastic</p>
<p>KE</p> <p><u>Point out</u> the bones</p> <ul style="list-style-type: none"> • on the chart • on your body 	<p>PE</p> <p><u>Evaluate</u> a procedure</p> <p><u>Demonstrate</u> a procedure</p>	<p>AE</p> <p><u>Meet</u> the list of criteria given</p> <p><u>React</u> humanely and calmly to patient's worries and fear</p>
<p>KR</p> <p><u>Read</u> text chapter</p> <p><u>Look at</u> slides, films</p>	<p>PR</p> <p><u>Study</u> required procedures</p> <p><u>Look up</u> diet in the hospital diet manual</p>	<p>AR</p> <p><u>Look at</u> list of attitude criteria</p>

THE BARBER'S SELF-IMPROVEMENT MATRIX

<p>KO</p> <p><u>Communicate</u> with the customer in a two-way dialogue</p>	<p>PO</p> <p><u>Care</u> for the hair needs of individual</p>	<p>AO</p> <p><u>Keep</u> the customer satisfied</p>
<p>KE</p> <p><u>Find out</u> what customer wants</p>	<p>PE</p> <p><u>Meet</u> all professional standards</p>	<p>AE</p> <p><u>Function</u> as an ethical professional</p>
<p>KR</p> <p><u>Probe</u> a range of clients from communicative and uncommunicative</p>	<p>PR</p> <p><u>Practice</u> new techniques (e.g., puff drying) newly acquired at refresher seminars</p>	<p>AR</p> <p><u>Grow</u> with latest research, skills, and marketing techniques</p>

TYPICAL X-RAY RESULT
(RAW SCORE)

<p>KO</p> <p>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX</p> <p>XXXXXXXX XXXXXXXX XXXXXXXX</p>	<p>PO</p> <p>XXXXXXXXXX XXXXXXXXXX</p>	<p>AO</p> <p>XXX</p>
<p>KE</p> <p>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX</p> <p>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX</p>	<p>PE</p> <p>XXXXX</p>	<p>AE</p> <p>X</p>
<p>KR</p> <p>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX</p> <p>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX</p>	<p>PR</p> <p>XXXXX XXXXX XXXXX</p>	<p>AR</p> <p>X</p>

TYPICAL X-RAY RESULT
(DETAIL)

<p>KO</p> <p>KNOW KNOW KNOW KNOW KNOW KNOW KNOW KNOW KNOW KNOW KNOW</p> <p>MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE MEMORIZE</p>	<p>PO</p> <p>CARE CASE COUNSEL TEACH</p>	<p>AO</p> <p>ATTITUDE VALUES ATTITUDE</p>
<p>KE</p> <p>TF MC MATCH TF MC MATCH TF MC MATCH TF MC FILL IN TF MC FILL IN TF MC FILL IN TF MC ESSAY TF MC ESSAY TF MC ESSAY TF MC RECITE TF MC RECITE TF MC RECITE</p>	<p>PE</p> <p>PLEASE SUPERVISOR</p>	<p>AE</p> <p>DON'T BE NASTY</p>
<p>KR</p> <p>BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE NOTES BOOK ARTICLE ENCYCLO- BOOK ARTICLE PEDIA BOOK ARTICLE PDR</p>	<p>PR</p> <p>ONE SET OF PROCEDURES</p>	<p>AR</p> <p>MOTIVATE</p>

AN OBJECTIVE TO BE PLACED
ON THE MATRIX

CONDITION: Given the following conditions

1.11 Access to supply room

1.41 Selected Patients

PERFORMANCE: The student will

2.10 Select equipment

2.40 Give a complete bed bath

EXTENT: Evaluated according to the following criteria

- 3.11 Wash hands
- 3.12 Bath towel
- 3.13 Face towel
- 3.14 Wash cloth
- 3.15 Bath blanket
- 3.16 Pt. gown
- 3.17 Bath basin
- 3.18 Soap and soap container
- 3.19 Skin lotion
- 3.20 Talcum powder
- 3.21 Deodorant
- 3.22 Water at 105-115° F. (maintained throughout bath)
- 3.23 Bed pan
- 3.24 Urinal
- 3.25 Articles for nail and hair care
- 3.26 Prepared (in regard to room temperature and position)
- 3.27 Privacy and convenience (screen patient)
- 3.41 Head to toe following accepted procedure (one area at a time)
- 3.42 Far to near side (principle of from clean to dirty)
- 3.43 Urinal or bed pan offered
- 3.44 Patient not exposed during entire procedure
- 3.45 Don't leave soap in basin of water; no dripping on patient
- 3.46 Hair care
- 3.47 Oral hygiene
- 3.48 Observe patient's status. (mental and physical)
- 3.49 Observation and procedures charted
- 3.50 Wash hands afterwards
- 3.51 Put equipment away
- 3.52 Patient's comfort

OVERVIEW OBJECTIVES FOR
PAGES 19 to 32

Pages 19 to 32 give an example of what one teacher did after reading pages 1 to 10. These pages contain objectives, evaluations, and resources that try to tie together an overview of the course.

As a result of objective 1 to 6, the successful learner will:

OBJECTIVE 01

- 1. TIE TOGETHER information building blocks into higher level processes.
- 2. GO BEYOND what to do and how to do it to stress the reason why.

OBJECTIVE 02

- 1. FUNCTION professionally as trained by supervisors.
- 2. WORK OUT one's own professional response.

OBJECTIVE 03

- 1. GROW in ability to function in crises.
- 2. RELATE humanly to others in stress and strains that can be anticipated.

RN
 BL #00 (INTRODUCTION TO THE SYSTEM)
 UN #00 (OVERVIEW)
 OBJ #01 (KO) (MASTERY)

1.00 CONDITIONS: Given the following conditions

- 1.11 Content to memorize
- 1.12 Books to research
- 1.13 Classroom presentation
- 1.14 Group-work sessions
- 1.21 Theories to conceptualize
- 1.22 Current magazine articles
- 1.23 Independent research projects
- 1.24 Explanations of clinical techniques

2.00 PERFORMANCE: The successful learner will

- 2.10 Tie together information building blocks into higher level processes (KO) (MASTERY)
- 2.20 Go beyond "what" to do and "how" to do it to stress the reason "why" (KO) (MASTERY)

3.00 EXTENT: Evaluated according to the following extent criteria

- 3.11 Pinpoint up-to-date information (KE)
- 3.12 Identify outdated "facts" (KE)
- 3.13 Participate actively (AE)
- 3.14 Establish team cooperation (AE)
- 3.21 Apply concepts to cases and examples (KE)
- 3.22 Seek out latest research on area of speciality (AE)
- 3.23 Create imaginative approaches (PE)
- 3.24 Motivate oneself and others (AE)

RN
 BL #00 (INTRODUCTION TO THE SYSTEM)
 UN #00 (OVERVIEW)
 RES #01 (~~KR~~) (~~MASTERY~~)

LEARNING RESOURCE 01 (TEACHING TECHNIQUES)

Go beyond teaching "content" to stress "processes" that provide built-in self-renewal potential.

LEARNING RESOURCE 02 (DEMONSTRATION)

Explain what you're doing in lay terms with enough to ask questions and to voice any fears. Give a chance to ask questions. Don't explain as if you were a recording. This applies to all nursing procedures in everything a PN does.

LEARNING RESOURCE 03 (DISCUSSION) (REPORTS)

Learners can miss the point in discussions, in magazines, and in books. Teacher questions can get learners to go beyond jargon. Words must be backed up with experiences and examples.

LEARNING RESOURCE 04 (INTEGRATION)

Many of these emotional aspects examples could refer equally to BL 09 UN 05 on cancer, to BL 09, UN 12 on gastro-intestinal.

SOCRATES says, "Know thyself."
 CICERO says, "Control thyself."

LEARNING RESOURCE 05 (CONTENT)

Learners can't be expected to learn every name (Freud, Maslow, Alport, Jung, Adler, etc.) in personality theory. Similarly, theories of learning need not be squeezed into a few hours. Provide a couple of good examples that get the point across, rather than data to memorize even when it doesn't apply. PN must deal with people, talk to them, and meet their needs. THUS: eliminate unnecessary items.

LEARNING RESOURCE 06 (TEACHING TECHNIQUE)

Illness here is really "physical illness and its effects upon the person's emotions." (This is not the place to give a mini-course on psychoanalysis.)

- RN
- BL #00 (INTRODUCTION TO THE SYSTEM)
- UN #00 (OVERVIEW)
- RES #01 (KR) (MASTERY)

LEARNING RESOURCE 07 (TEXT NOTE)

Kearnes' text goes into too much details about antigens in the allergy section. PN's don't have to go into details that don't relate to job functions. There is a danger here that students studying such unnecessary complexities may waste time and/or get confused. (Two or three pages could sum up all PN's need to know on some topics.)

LEARNING RESOURCE 08 (TEACHING TECHNIQUE)

Complex math and formulas are very rare on the PN job. Certain things must be learned: terminology, equivalences, usual dosages, classifications, and side effects, antagonists. Teachers must revise lesson plans to stress common sense applications: e.g., 1.5 grains is not 3 times 5 grains.

LEARNING RESOURCE 09 (PN ROLE)

Every nurse is a teacher. Patients must be told what to expect. With mellowing and experience, people can become more flexible and adaptive.

LEARNING RESOURCE 10 (EXAMPLES)

Body image and self-concept are related. A surgical change (e.g., mastectomy) can influence the patient's personality and recovery. This equally applies to the emotional aspects of cancer.

LEARNING RESOURCE 11 (TEACHING TECHNIQUE)

Adjust preplanned materials to the objectives you have in mind. Avoid needless details.

LEARNING RESOURCE 12 (BOOK)

Read the teacher's manual. Select those ideas you can implement. Avoid those you reject.



RN
 BL #00 (INTRODUCTION TO THE SYSTEM)
 UN #00 (OVERVIEW)
 EVAL #01 (KE) (MASTERY)

TEST ITEM 01 (TESTING TECHNIQUE)

Use multiple choice questions for evaluating beginner-level knowledge objectives.

Do not use multiple questions as your exclusive means of evaluating higher level knowledge objectives.

TEST ITEM 02 (CRITERIA)

Each school establishes its own criteria: e.g., prerequisites 2 units of science; biology; chemistry; physics; math. One of which must be biology.

Be sure you can live with whatever criteria you come up with.

- ANSWER : A. staff acceptance C. easy to explain
 B. student acceptance D. easy to defend

RN
 BL #00 (INTRODUCTION TO THE SYSTEM)
 UN #00 (OVERVIEW)
 OBJ #02 (PO) (MASTERY)

1.00 CONDITIONS: Given the following conditions

- 1.11 Highly supervised clinical experiences
- 1.12 Clearly defined, albeit limited, nursing responsibilities
- 1:21 Moderately unsupervised clinical responsibilities

2.00 PERFORMANCE: The successful learner will

- 2.10 Function professionally as trained by supervisors (PO) (MASTERY)
- 2.20 Work out one's own professional response (PO) (MASTERY)

3.00 EXTENT: Evaluated according to the following extent criteria

- 3.11 Chaff not under on the spot criticism (AE)
- 3.12 Do more than following directions blindly and inhumanly (AE)
- 3.13 Do no harm (PE)
- 3.14 Comfort patient (AE)
- 3.21 Meet medical/nursing standards (PE)
- 3.22 Demonstrate individuality (AE)
- 3.23 Listen to patient (AE) (PE)
- 3.24 Respond to patient (PE)

RN
 -BL #00 (INTRODUCTION TO THE SYSTEM)
 UN #00 (OVERVIEW)
 RES #02 (PR) (MASTERY)

LEARNING RESOURCE 01 (PROCEDURES)

Before doing a procedure, the nurse should explain what is being done. Don't perform procedures while remaining silent. Communicate. This must be stressed over and over again.

LEARNING RESOURCE 02 (ANECDOTE)

"Don't refer to a patient by bed number."
 "Learn the name even if you learn nothing more"
 "Don't mispronounce the name."
 "Ask him or her how to pronounce the name properly."
 "Avoid a name not wanted by patient."

LEARNING RESOURCE 03 (DEMONSTRATION)

When there is a long interval between demonstration and application, theory never gets a chance to develop into clinical skill. Tie things together.

LEARNING RESOURCE 04 (JOB EXPECTATIONS)

Some hospitals expect a graduate to do everything. The hospitals must not expect too much from a PN who is not trained for supervisory roles. The first days are difficult enough with all the unexpected.

LEARNING RESOURCE 05 (REINFORCEMENT)

Programmed instruction won't work for most PN's unless it is followed immediately by on the job applications.

LEARNING RESOURCE 06 (DEMONSTRATION)

Don't teach details only one way when they vary from hospital to hospital. We need to get learners interested, but not confused. Don't ruin a good film by showing it too soon or at the wrong time.

LEARNING RESOURCE 07 (NO NO List)

Errors:

- not wait for instructor
- give it on one's own
- needless to correction

RN

BL - #00 (INTRODUCTION TO THE SYSTEM)

UN #00 (OVERVIEW)

EVAL #02 (PE) (MASTERY)

TEST ITEM 01 (EVALUATION)

In evaluating for a grade in the clinical area, do not penalize the learner for self-correction. Thus, if a learner contaminates a catheter, this is an error. However, if the learner replaces the contaminated catheter with a sterile catheter, this is not an error. It is a case of good judgement and professional conduct on the job.

Such self-correction on the job is similar to erasing an answer on an answer sheet before turning the paper in for a grading.

TEST ITEM 02 (GRADING)

It is sometimes difficult to decide when to use a clinical evaluation for a grade. Some schools rate the student either S for satisfactory or U for unsatisfactory. This S or U rating takes place on each clinical lab day. Similar grading is used in the testing situation. When properly worked out, each U can represent a minus one from the final grade. This is true when the U has not been corrected or replaced. A grade of U is usually reserved for a growth error.

TEST ITEM 03 (EVALUATION KITS)

Develop skill evaluations. Place all necessary equipment together, e.g., in a shoe box.

TEST ITEM 04 (CLINICAL EVALUATION)

Clinical evaluation takes time and effort. We can measure specific skills by observation. This works in fundamentals. Yet, certain safety failures require absolute accuracy. In a clinical setting, we need to evaluate many skills at the same time. The Do or Fail list must stress critical minimum behaviors.

ANSWER : A. produce your DO OR FAIL list
B. publicize it
C. defend it against all comers -- or change it

RN
BL #00 (INTRODUCTION TO THE SYSTEM)
UN #00 (OVERVIEW)
OBJ #03 (AO) (MASTERY)

1.00 CONDITIONS: Given the following conditions

- 1.11 Medical team
- 1.12 Hospital routine
- 1.13 Wide range of patient demands

- 1.21 Shift responsibilities
- 1.22 No more than normal supervision
- 1.23 Very little surveillance
- 1.24 Typical human relations bottlenecks

2.00 PERFORMANCE: The successful learner will

- 2.10 Relate humanly to others in stress and strains that can be anticipated (AO) (MASTERY)
- 2.20 Grow in ability to function in crises (AO) (MASTERY)

3.00 EXTENT: Evaluated according to the following extent criteria

- 3.11 Get along with peers (AE)
- 3.12 Divide up the care given (PE)
- 3.13 I-L-C for more than agreeable patients (AE)
- 3.14 Empathize with "others" unlike oneself (AE)

- 3.21 Meet obligations (PE)
- 3.22 Self-evaluate (AE)
- 3.23 Develop a perspective (AE)
- 3.24 Relax via double techniques (AE)

RN
 BE #00 (INTRODUCTION TO THE SYSTEM)
 UN #00 (OVERVIEW)
 RES #03 (AR) (MASTERY)

LEARNING RESOURCE 01 (SELF-IMAGE)

Body odors, messy appearances, and sloppiness convey a message to the patient. "Since I don't care about myself, I don't care about you." Good grooming is therapeutic.

LEARNING RESOURCE 02 (COMMUNICATIONS)

Nurse patient relations and communications with one another both verbally and non-verbally on a one to one basis must be stressed both now and in psych (BL 06, UN 04). Stress nurse-patient interaction right from the start.

LEARNING RESOURCE 03 (COMMUNICATIONS)

- A. Know yourself
- B. One-to-one relationships
- C. Verbal and non-verbal communications
- D. Nurse-patient relationship

LEARNING RESOURCE 04 (DATA)

Most hospital patients are elderly. Students must learn how to like working with them in a professional manner. Not all the elderly are senile. Nurses need to feel the pride of "I know how to treat professionally the elderly sick no matter what the medical complication." Real nurses go beyond, "I deal only with the elderly gems who never complain or demand care."

LEARNING RESOURCE 05 (FILM)

Use Concept Media to get points across.

LEARNING RESOURCE 06 (FILM)

Learners must begin to relate media and class discussions to actual patients. We can't always choose the type of case we may need for a specific lesson.

LEARNING RESOURCE 07 (MOTIVATION)

How to motivate _____ →

- Enthuses
- Lose interest (Each part counts)



RN
BL #00 (INTRODUCTION TO THE SYSTEM)
UN #00 (OVERVIEW)
RES #03 (AR) (MASTERY)

LEARNING RESOURCE 08 (GROUPING PRINCIPLES)

TRACK STUDENTS

- a. Common care
Speciality options
- b. Class activities
Individdal learning experiences
- c. Take the course
Challenge the competency via an external agency (RED)

LEARNING RESOURCE 09 (INDIVIDUALIZATION)

When using machines to individualize, you can lose contact with students. Time will be spent with them, even many more hours, but you may not get to know learners as well as before.

LEARNING RESOURCE 10 (SCHEDULING PRINCIPLES)

An easy scheduling solution. Put up a list from which students can sign up.

RN
BL #00
UN #00
EVAL #03 (AE) (MASTERY)

TEST ITEM 01 (EVALUATION STRATEGIES)

Progress at own rate

- Deadlines (Wide enough)
- Auto-tutorial

TEST ITEM 02 (GRADING)

Unsafe - critical - unrecognized - uncorrected → U

ANSWER . You must come up with easy to understand examples of what U or UNSATISFACTORY means. You must go beyond vague general terms.

RN
BL #00 (INTRODUCTION TO THE SYSTEM)
UN #00 (OVERVIEW)
OBJ #04 (KO) (BEGINNER)

1.00 CONDITIONS: Given the following conditions

1.11

1.12

1.21

1.22

2.00 PERFORMANCE: The successful learner will

2.10 Translate memorized data into clinical examples (KO) (BEGINNER)

2.20 Ask questions about techniques before doing (KO) (BEGINNER)

3.00 EXTENT: Evaluated according to the following extent criteria

3.11

3.12

3.21

3.22

RN
BL #00 (INTRODUCTION TO THE SYSTEM)
UN #00 (OVERVIEW)
OBJ #05 (PO) (BEGINNER)

1.00 CONDITIONS: Given the following conditions

1.11
1.12

1.21
1.22

2:00 PERFORMANCE: The successful learner will

2.10 Carry out professional orders with procedures already practiced
(PO) (BEGINNER)

2.20^r Care for patient orderly and responsibly in non-crisis
treatments (PO) (BEGINNER)

3.00 EXTENT: Evaluated according to the following extent criteria

3.11
3.12

3.21
3.22

RN
BL #00 (INTRODUCTION)
UN #00 (OVERVIEW)
OBJ #06 (AO) (BEGINNER)

1.00 CONDITIONS: Given the following conditions

1.11

1.12

1.21

1.22

2.00 PERFORMANCE: The successful learner will

2.10 Not over-react to criticism (AO) (BEGINNER)

2.20 Pinpoint one's strengths and weaknesses (AO) (BEGINNER)

3.00 EXTENT: Evaluated according to the following extent criteria

3.11

3.12

3.21

3.22

PRETEST FOR WORK SESSION I

DIRECTIONS: Circle true or false before each statement to indicate the answer chosen.

- TRUE FALSE 1. The Knowledge Objective (KO) of work session I is to update existing materials by organizing them in terms of knowledge, performance, and attitude, in the three dimensions of objectives, evaluations, and resources.
- TRUE FALSE 2. A Performance Objective (PO) of work session I is to fill in this organizational pattern on a matrix.
- TRUE FALSE 3. The Attitude Objective (AO) of work session I is to put together a better learning system by matrix analysis, organization, and improvement.
- TRUE FALSE 4. Page 11 provides nine questions that can be used to fill in the matrix analysis.
- TRUE FALSE 5. The matrix on page 12 is an example of what a teacher did after reading the first ten pages of work session I.
- TRUE FALSE 6. The matrix on page 13 is an example of how another reader of pages 1 to 10 used the matrix to make an anatomy lesson more interesting and more functional than brute memorization.
- TRUE FALSE 7. The matrix on page 14 is a summary of the example developed on pages 1 to 10.
- TRUE FALSE 8. The matrix on page 14 is a matrix developed by a barber who read pages 1 to 10.
- TRUE FALSE 9. Each X in each component of the matrix on page 15 stands for the presence of a matrix component.
- TRUE FALSE 10. The X in the AR component of page 15 indicates that the material examined had one attitude resource (AR).
- TRUE FALSE 11. The three X's in matrix component AO on page 15 indicates that the material examined had two components, identified as attitude objectives (AO).

- TRUE FALSE 12. A rapid analysis of the X's on page 15 indicate that the material examined was top heavy in the area of knowledge, that is, KO, KE, and KR.
- TRUE FALSE 13. According to the typical x-ray results found on page 15, the material examined had the least material in the performance area, that is, PO, PE, and PR.
- TRUE FALSE 14. The detailed x-ray results of page 16 shows that there were only five main categories of knowledge resources (KR), that is, books, articles, notes, encyclopedias, and PDR.
- TRUE FALSE 15. The detailed analysis of page 16 shows that the two main categories of performance evaluation (PE) were to please one's supervisor and to compare one's performance with the checklists provided.
- TRUE FALSE 16. The detailed objective printed on page 17 contains everything appearing in the matrix printed on page 6.
- TRUE FALSE 17. The long list of criteria appearing in the objective printed on page 17 boil down to an equipment checklist and a procedure checklist.
- TRUE FALSE 18. This pretest has been used as a preview device of work session I and the accompanying documentation.
- TRUE FALSE 19. The objectives found on page 13 give an overview of the objectives, evaluations, and resources found on pages 19 to 32.
- TRUE FALSE 20. On page 19, conditions 1.11 to 1.14 and criteria 3.11 to 3.14 refer to the performance 2.10 that ties everything together.
- TRUE FALSE 21. The learning resources found on pages 20 and 21 are directly correlated to the objectives found on page 19.
- TRUE FALSE 22. The test items found on page 22 are directly correlated to the objective found on page 19.
- TRUE FALSE 23. The objectives found on page 23, the resources found on page 24, and the test items found on page 25 are directly correlated one with another.
- TRUE FALSE 24. The objectives found on page 26, the learning resources found on pages 27 and 28, and the test items found on page 29 are not directly correlated one with another.
- TRUE FALSE 25. The incomplete objectives, the missing learning resources, and the missing test items on pages 30, 31, and 32 are left as an exercise to the learner.

ANSWER KEY TO WORK SESSION I

DIRECTIONS: Use the following answer key to check for correct answers.

- | | |
|-----------|-----------|
| 1. TRUE | 13. FALSE |
| 2. TRUE | 14. TRUE |
| 3. TRUE | 15. FALSE |
| 4. TRUE | 16. FALSE |
| 5. TRUE | 17. TRUE |
| 6. TRUE | 18. TRUE |
| 7. FALSE | 19. TRUE |
| 8. TRUE | 20. TRUE |
| 9. TRUE | 21. TRUE |
| 10. TRUE | 22. TRUE |
| 11. FALSE | 23. TRUE |
| 12. TRUE | 24. FALSE |
| | 25. TRUE |

Readers who have succeeded on the pretest may go directly to the posttest.

Readers who want more information should proceed at this time to the section entitled, LEARNING ENVIRONMENT FOR WORK SESSION I.

POSTTEST FOR WORK SESSION I

DIRECTIONS: For the following questions, circle true/false in front of the correct answer.

- TRUE FALSE 1. A matrix is a one-page learning plan.
- TRUE FALSE 2. A matrix gives an overview of an entire fail-safe student-paced module.
- TRUE FALSE 3. As developed in work session I, a matrix can be compared to a blueprint of a module.
- TRUE FALSE 4. The easiest way to develop a matrix is to develop a module first.
- TRUE FALSE 5. Any teacher who has given a successful course should be able to develop a matrix in one hour or less.
- TRUE FALSE 6. Any teacher who has developed a successful course should be able to identify existing pieces of both the matrix and the module in the material currently being used for instruction and learning.
- TRUE FALSE 7. According to the philosophy of work session I, nothing among pre-existing materials should be incorporated into a module or matrix.
- TRUE FALSE 8. This document and the accompanying explanations provided shows that usually speaking, a module is composed of (a) objectives, (b) pretests, (c) learning environment, and (d) posttest.
- TRUE FALSE 9. The "O" section of the matrix is found in the objectives component of the module.
- TRUE FALSE 10. The "E" component of the matrix is found only in the pretest component of the module.
- TRUE FALSE 11. The "R" component of the matrix is found in the learning environment component of the module.
- TRUE FALSE 12. In general, the matrix and the module for the same objectives are identical except that the matrix is much longer and much more complete.

- TRUE FALSE 13. A true/false test is not sufficient if the objective of the module is performance mastery beyond circling true or false.
- TRUE FALSE 14. To be adequate, any posttest of work session I should include the opportunity to develop at least a matrix.
- TRUE FALSE 15. A even better posttest for work session I would be an opportunity to develop a module, at least, in part.

DIRECTIONS: Answer the following questions separately by following the directions given.

16. Gather together the best materials available on a specific topic.
17. Organize these materials into three piles: Objectives, evaluations, and resources.
18. Develop a sample matrix that includes the best materials available and the best needed components.
19. Assemble the best materials available into a module type format.
20. Exchange these materials with colleagues in order to fill in the gaps in both the matrix and the module.

ANSWER KEY

POSTTEST FOR WORK SESSION I

1. True
2. True
3. True
4. False
5. True
6. True
7. False
8. True
9. True
10. False
11. True
12. False
13. True
14. True
15. True

16. See Instructor
17. See Instructor
18. See Instructor
19. See Instructor
20. See Instructor