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ABSTRACT

This module on principles of teaching is 1 in a series of 10 modules written for vocational education teacher education programs. It is designed to enable the teacher to do the following: (1) identify subject matter and integrate that subject matter with thought-provoking questions; (2) organize and demonstrate good questioning techniques; and (3) evaluate responses and encourage all possible solutions. Introductory materials are as follows: lists of competencies and objectives methods of instruction, and suggested resources, and management logistics. The content of the module focuses on problem-solving techniques for teachers. Activities are provided to enable teachers to use the material learned. A domain identification form is included for identifying which objectives are primarily cognitive, psychomotor, or affective. An evaluation procedure is provided. (YLB)

MODULE:
Principles of Teaching

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MODULE: PRINCIPLES OF TEACHING

Competencies:

Identify and nurture effective classroom questioning techniques.

Develop questions that will check for key points of instruction.

Organize subject matter with questions to identify basic concepts.

Arrange material and questions in such a way to encourage critical thinking.

Demonstrate problem solving techniques that will stimulate interaction among students.

Demonstrate problem solving techniques that will stimulate interaction between the students and teacher.

Identify and utilize Bloom's Taxonomy of Education Objectives.

Objectives:

After completion of this module, the teacher will be able to:

1. Identify subject matter and integrate that subject matter with thought provoking questions.
2. Organize and demonstrate good questioning techniques.
3. Evaluate responses and encourage all possible solutions.

Methods of Instruction:

1. Lecture
2. Role playing
3. Student lectures and demonstrations

Suggested Resources:

1. Supplies: Textbook, Chalkboard and chalkboard equipment, Overhead projector
2. Handouts:

   Bloom, Benjamin S., Cognitive Domain Levels of Learning

   Bloom, Benjamin S., Affective Domain Levels of Learning

   Bloom, Benjamin S., Psychomotor Domain Levels of Learning

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Bloom, Benjamin S., Taxonomy of Educational Objectives Handbook I: Cognitive Domain. New York: David McKay Company, Inc., 1964.

Simpson, Elizabeth Jane. The classification of educational objectives psychomotor domain. Illinois Teacher of Home Economics, Volume X, Number 4, Winter 1966-67, pp. 110-144.

Krathwohl, David R.; Bloom, Benjamin S.; and Masia, Bertram B., Taxonomy of Educational Objectives Handbook II: Affective Domain. New York: David McKay Company, Inc., 1964.

3. Videos/Film:

4. Guest Lecturers:

5. Assignment:

   a. Read the listed literature from the American Association for Vocational Instructional Materials, conduct group discussions, panel discussions, symposiums, employ brainstorming, buzz groups, and question box techniques.

   b. Employ oral questioning techniques.

   Prepare a written lesson plan over a task of your choice. Develop the technique and questions you would use to create more thought in the classroom.

6. References/Bibliography:

   a. Miller, W.R., Instructors and Their Jobs, American Technical Publishers, Inc., 1990, Homewood, Illinois 60430, Chapter 7.

   b. Hawley, Susan H. and Hawley, Robert C., A Teacher's Handbook of Practical Strategies for Teaching Thinking, E.R.A. Press, 1987, Education Research Associates, Amherst, Massachusetts, 01004.

   c. Gronlund, Norman E., Stating Behavioral Objectives for Classroom Instruction, The McMillan Company, 1970.

   d. Thiagarajan, Sivasailam, Take Five for Better Brainstorming, Training Development Journal, February 1991.

   e. American Association for Vocational Instructional Material, Employ Oral Questioning Techniques, Second Edition, 1984, The University of Georgia, 120 Driftmier Engineering Center, Athens, GA 30602.

   f. Category B - Instructional Planning, Module B-2, Develop Student Performance Objectives, American Association for Vocational Instructional Materials, The University of Georgia, 20 Driftmier Engineering Center, Athens, GA 30602.

   g. Instructional Planning, Module B-2, Develop Student Performance Objectives, American Association for Vocational Instructional Materials, The University of Georgia, 20 Driftmier Engineering Center, Athens, GA 30602.

Notes

7. Activities:

   a. Select a student performance objective in your occupational specialty. Then, briefly outline the material you would cover to introduce, present, and summarize a lesson designed to achieve that objective. You may use a lesson plan you have developed previously.

   b. Prepare two or three oral questions at each of the six taxonomic levels that could help you introduce, present, or summarize the material in your lesson plan. When writing questions at the comprehension level, write one question at each of the three sub-levels. Number each question for easy reference during feedback.

   c. Select a student performance objective in your occupational specialty and develop a detailed lesson plan for achieving that objective. As part of your plan, develop a series of oral questions to direct and motivate student's thinking throughout the lesson in a well-organized and meaningful way. Be sure to include questions at the higher taxonomic levels. Instead of developing a lesson plan, you may select a lesson plan that you have developed previously and adapt that plan so that it includes the use of oral questioning techniques.

   d. In a simulated classroom situation, present your lesson to a group of two to five peers. These peers will serve two functions: (1) they will role-play the students to whom you are presenting your lesson, and (2) they will evaluate your performance. If peers are not available to you, you may present your lesson to your resource person.

   e. If you wish to self-evaluate, you may record your performance on videotape or audiotape so you may view/listen to your own presentation at a later time.

   f. As you plan your lessons, decide when oral questions could be used effectively to aid you in meeting the lesson objectives. Based on that decision, employ oral questioning techniques. This will include -
   - selecting, modifying, or developing a lesson plan that includes the use of oral questions to introduce, present, and/or summarize the lesson.
   - including in the lesson a series of oral questions at different taxonomic levels
   - presenting the lesson to the class.

   NOTE: Your resource person may want you to submit your written lesson plan to him/her for evaluation before you present your lesson. It may be helpful for your resource person to use TPAF from Module B-4, "Develop a Lesson Plan" to guide his/her evaluation.

   Adapted from American Association for Vocational Instructional Materials, Employ Oral Questioning Techniques, Second Edition, 1984, The University of Georgia, 120 Driftmier Engineering Center, Athens, GA 30602.

Management Logistics:

1. Evaluation/Grading: Final grades will be based on student achievement in terms of the objectives. Measurement of student achievement constitutes class attendance, oral interaction in class discussion, completion of written assignments, written examinations, and cooperation and performance in group activities.

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2. Suggested Schedule/Time: Nine hours of instruction

3. Other:

Content/Instructional Strategies

1. Pre-requisite information: None

2. Introduction: We must assume that part of education is developing the student's ability to think critically and act responsibly. Critical thinking starts with questions. Questions quickly identify problems that need solutions.

3. Body of Lesson:

   A. Problem Solving Techniques for Teachers

      1. Develop "Thinking" in the classroom
         a. Preparing the students for thinking
         b. Shifting thinking responsibility from the teacher to the students

      2. Identify the Problem: Develop the Ability to Question
         a. Branch thinking
         b. Branch thinking strategies
         c. Develop an amalgamation of knowledge
         d. Bloom's Taxonomy of Learning

      3. Identify the Elements Involved
         a. Unresolved questions
         b. Identify further research

      4. Procuring Information Pertinent to the Problem
         a. Identifying knowledge and information in the classroom
         b. Identify questions needing further study
         c. Identify sources for further study
         d. Focalization of knowledge and information

      5. Guided Formulation of Solution
         a. Identify possible solutions to the problem
         b. Discussion of advantage of all possible solutions
         c. Discussion of disadvantage of all possible solutions
         d. Identify additional research if necessary

      6. Evaluation of all Possible Solutions
         a. Discussion of possible solutions
         b. Identifying factors that will effect selection of a solution

      7. Testing Possible Solutions
         a. Develop evaluation system

      8. Assessing Results and Making Selection

   B. Learning Experience

Notes

1. Prepare a series of questions over a task of your choice that you might use to create thought in the classroom.

4. Summary and Reviews:
   a. Methods of preparing students to think in classroom
   b. Branch thinking
   c. Methods of guiding the formulation of solutions
   d. Solutions evaluation

5. Activities:

A. **Take Five for Creative Problem Solving**

An activity that usually requires from 20 to 40 minutes depending on the depth. The activity is ideally played with 20 to 30 individuals divided into five equal teams but is not limited to that number. The activity will work equally well with fewer than or more than the suggested number of individuals.

The materials for each player includes paper and pencil plus chalk and chalkboard or flipchart and felt marker for the activities leader.

How to Get Started on Take Five Activity

1. Explaining the procedure. Identify the topic or topics for the conference. Example: Methods of motivation, discipline techniques, stimulate thinking, identification of discipline problems, causes of discipline-student related and teacher related. Think back as a student and try to remember those things that affected you. What motivated you or what action or reaction seemed to cause the most discipline problems? How could it have been changed, etc.?

2. Individual activity - each individual is given 2 or 3 minutes to prepare a personal list of ideas related to the topic. Work individually and without consultation.

3. Group management - after the 2 or 3 minutes of individualized activities is completed ask the individuals to form groups of five. Provide a brief introduction and then give each group 5 minutes to compile a long list of ideas drawn from each individual from within the group.

4. Compiling a group conscious list - call the meeting back together and instruct each team of 5 to contribute one item from its list. Each team should work together to select and restate the team's most important item into one clear statement. The team's statement is to be written on the chalkboard or flipchart. Each team is instructed to select its most important item. There should be no repetition of ideas on the chalkboard. The list should include no more than 10 ideas.

B. Not all students performance objectives are alike. As a teacher, you not only will want your students to be able to perform certain skills but also will be concerned about the knowledge they possess and the attitudes they have about themselves, their co-workers, and their jobs. Read the following information sheet to learn how to recognize and write objectives that deal with these areas of your teaching.

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(optional) For further information on the cognitive and affective domains and the levels within each domain, you may wish to review Bloom, Taxonomy of Educational Objectives: Handbook I: Cognitive Domain; and/or Krathwohl, Taxonomy of Educational Objectives: Handbook II: Affective Domain.

(optional) You may wish to meet with your resource person or with peers who are also taking this module to discuss the different domains. You could discuss specific competencies from your own service area that would fit each domain. Or, you could review objectives in curriculum guides and attempt to categorize them by domain and by taxonomic level.

C. The following activity checks your comprehension of the material in the information sheet, Performance Objective Domains, pp. 31-37. Each of the following objectives is primarily cognitive (C), psychomotor (P), or affective (A). Reach each student performance objective, and indicate its primary domain by placing the appropriate letter (C, P, or A) in the blank to the left of the item.

Domain Identification Form

____ 1. Following a demonstration of techniques for stitching heavy materials, you will stitch given materials so that they will pass simulated inspection guidelines.

____ 2. Given samples of various legume seeds, you will identify each by name with 100% accuracy.

____ 3. Upon completion of the section on alternatives in business careers, the students will have increased their awareness of options available to them, as demonstrated by their being able to identify 50% more of the opportunities on the post-test than on the pre-test.

____ 4. You will define the editing symbols on a given list with 90% accuracy.

____ 5. On the assigned hospital ward, you will transfer doctors' orders to the appropriate forms for those orders. All forms must receive a "satisfactory" rating on the critical points outlined on the clinical evaluation form.

____ 6. Given ten lists of from 4 to 15 three-digit numbers, you will calculate totals for the lists on any of the four makes of adding machines found in the simulated office practice laboratory.

____ 7. You will specify any missing or incomplete information on the five completed short-term loan contracts provided with 80% accuracy.

____ 8. In the clinical setting, you will demonstrate concern for apprehensive patients by --
- answering call lights promptly,
- staying with an apprehensive patient or seeing that someone will be present,
- talking with the patient about the apprehension and answering questions about the unknown, and
- explaining all procedures before using them with patients.

Notes

____ 9. Given a series of Ohm's Law problems that contain any two of the values for current, voltage, or resistance, you will calculate the missing value with 100% accuracy on at least 80% of the problems.

____ 10. Provided the necessary soil test data and necessary crop information, you will determine the kinds of nutrients to be applied to the soil to grow a crop.

____ 11. Using a soil survey report, determine the quantities of nutrients needed and outline the rationale for your decision using previous crop and test information.

____ 12. The student, when confronted with a safety hazard, will demonstrate concern for safety practices by --
- pointing out safety hazards to others,
- turning off all machinery when it is not being used by self or others, and
- observing all caution signs.

____ 13. Given ten shafts with differing measurements, you will measure the diameter of each with a micrometer within ± .001" of the instructor's measurement.

____ 14. You will compose a resume' that outlines your qualifications for a given job and contains all the components identified in the lesson on writing resumes'.

____ 15. You will change any cash register tape within two minutes so that the register is ready for tabulation.

____ 16. When confronted with a situation requiring the clarification of instruction, you will ask for clarification before proceeding.

____ 17. Given a written situation involving the adaptation of basic procedures, you will outline the method you would use to accomplish the task within the restrictions established.

____ 18. After viewing a videotaped sales presentation, you will critique the presentation, using the outline form provided. Your critique must match the model on all critical points identified.

____ 19. You will grease all critical points, as outlined by the manufacturer, on any car coming into the auto mechanics laboratory requiring routine maintenance.

____ 20 You will identify the objectives on a given list as primarily cognitive, psychomotor, or affective.

Compare your written responses on the domain identification form with the model answers given below. Your responses should exactly duplicate the model responses.

You may wish to go through the list of objectives again, identifying the general taxonomic level of each objective. Refer to samples 4, 5, and 6, or to the supplementary readings listed in this learning experience if you need help. If

Notes

you still have questions about the level of an objective, check with your resource person.

Evaluation Procedure

1. Prioritizing the conscious list - get the teams together and instruct each team to select from the conscious list the one item considered by the group to be most important. Remind them that they are selecting the one most important and not necessarily their own preference. Each team should select one and write it on a piece of paper. Allow two minutes for the selection.

2. Lay aside the common list developed by each group and work only with those items selected as being important.

3. The leader should rewrite, in abbreviated form, each of the selected items of importance.

4. Tally the results - each team reports the 1 choice they feel as a group is most important. Scoring is dependent on how many teams select the same item. Each team's score is equal to the number of teams that chose the item. Example: five teams are involved in the activity and 3 teams select item 1 and other 2 teams select item 5. Each team selecting item 1 will receive 3 points while those that selected item 5 will receive 2 points. Thus the three teams selecting item 1 each receive 3 points and the two teams selecting item 5 each receive 2 points.

5. Selecting on second round. Ask the teams to select from the remaining list of their nine top rated items. Use the same procedure as before with the same scoring system. At the end of each round eliminate the item receiving the most points. Continue this process until the top five items have been identified.

6. In case of a draw - if a round should develop into a draw, use the same procedure for scoring but don't eliminate any of the items. Provide the teams 1 minute to prepare arguments to support their choice. Give each team 30 seconds to present their arguments. As soon as the top 5 items have been identified recognize the team with the highest score.

Thiagarajan, Sirasailam, Take Five for Better Brainstorming, Training Development Journal, February, 1991.