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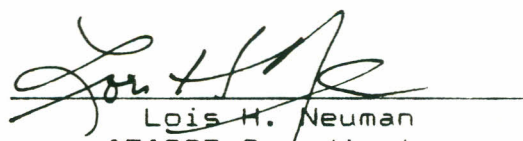January 17-18, 1991

Compiled by
Lois H. Neuman

FORWARD

This volume represents the research, practices and experience of a number of educators whose expertise is in community college education. AFACCT was fortunate to have many outstanding presentations at this first Annual Conference. The conference presenters who chose to submit their papers for publication here were among those who made the conference a thought-provoking and dynamic educational experience.

This conference was the result of the combined efforts of the AFACCT Board of Representatives who planned and participated in every aspect. Credit also goes to our colleagues and the Maryland Community College Vice Presidents and Deans for their support and participation. The faculty and staff at Chesapeake and Prince George's Community Colleges receive special thanks for their help and encouragement.

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PROCEEDINGS

Table of Contents

USING COOPERATIVE LEARNING STRUCTURES IN A NURSING CURRICULUM

Elaine Bishop Kennedy, RN, MS

Abstract

The knowledge that new graduates need increases daily. Patients in hospitals require increased nursing skill and may not be suitable to assign to a student for care. Decision-making and teamwork are unequivocal requirements in the quick paced "high tech" world of modern health care facilities.

Kagan (1989) states there is a socialization void in our society today stemming from changes in family structure and from television. Thus, young men and women are coming into nursing programs with fewer and less well used social skills.

Case method can successfully address many of the problems met when students need directed practice but patients need skillful nursing care. Case method is also an excellent vehicle for direct instruction in critical thinking skills, and for directed practice in group work.

Critical thinking, competence, and caring qualities are the attributes of excellence in nursing. Nursing faculty will help students to achieve those goals by adding cooperative learning structures to curricula.

Introduction

Nursing is in a state of constant evolution. In 1859, Florence Nightingale published Notes on nursing: what it is and what is not, a book for non-nurses that gave modern nursing it's first formalized theoretical framework and curriculum plan. In 1860 her plan was implemented at St.

1

Thomas' Hospital in London. Similar to the models used by education and medicine, nursing education combines theoretical knowledge with psychomotor knowledge in directed exercise. The great debate over what and how best to teach nurses has continued.

Dinham and Stritter (1986) claim that the task of educators is to move students from confusion to familiarity. Nursing curricula reveal disharmony when they do not use strategies that would optimize acquisition of skills for critical thinking and interpersonal relationships. These skills are crucial competencies needed to realize the role of nurse.

Content Knowledge

Theorists in nursing have formulated a number of theories and definitions for nursing. There are several themes that recur among all the theories. Kozier and Erb (1987) list nine common themes including nursing 1) is caring for and caring about people, 2) involves individuals, families, and the community; these entities are interrelated, and 3) as a science involves critical thinking. Additionally, nursing provides direct actions to and with people to improve or maintain their health.

There is constant tension placed on nursing curricula. The content knowledge that new graduates need increases daily. At the same time, patients in hospitals require increased nursing skill and may not be suitable to assign to a student for care. Further, in the quick paced "high tech" world of modern health care facilities, decision-making and teamwork are unequivocal requirements.

Decisions about content what content to teach are being directed by processes such as the nationwide job skills analysis of new graduates sponsored by the National Council for State Boards of Nursing. Additionally, faculty and program advisory committee input from observations of changing practices in health facilities where students are assigned keep content knowledge in a state of change.

Case Method

Case method can successfully address many of the problems met when students need directed practice but patients need skillful nursing care. Types of case method presentations include case problems, case reports, case studies, and research cases. Case method instruction also includes the use of simulation and gaming. The level of the information and the complexity ascends from case problems to research cases. Marquis (1987) offered the following list of benefits of using case method:

  (1) teachers can use cases to make a concept more
       concrete.

(2) case studies permit gaining and sharing experiences without actual involvement in a situation.

(3) there is less risk to students and clients when decision-making skills are practiced outside of a clinical setting.

(4) teachers can see students as mature problem-solvers.

(5) students can gain confidence in their problem-solving abilities.

(6) students can use insights gained in decision-making exercises for self growth.

(7) students can begin to determine widespread applications to problems that are familiar.

Among the disadvantages to the case method are (1) difficulty in making individuals accountable in a group process, (2) increasing focus on the correct solution rather than the process, (3) the number of cases needed to show the commonalities and differences is large, and (4) the number of students and groups needs to be large in order to demonstrate the diversity of problem-solving approaches.

Critical Thinking

Most programs in nursing, as part of their philosophy, state that nursing process is part of the framework on which nursing practice is built. Kozier and Erb (1987) state that nursing process is " a systematic, rational method of planning and providing nursing care."

The theoretical foundations for nursing process are found in nursing theory, humanistic theory, general systems theory, problem-solving/ decision-making theories, and perception theory. Mastery of nursing process depends on necessary skills such as critical thinking and the ability to synthesize information from both the physical and the social sciences.

Marzano et al (1988) state "we can improve students' ability to perform the various processes by increasing their awareness of the component skills and by increasing their skill proficiency through conscious practice." While the debate of content-specific problem-solving instruction versus general problem-solving skills instruction continues, nursing curricula use content-specific instruction in order to teach nursing students how to use nursing process. Detailed instruction in the core thinking skills of focusing, information gathering, remembering, organizing, analyzing, generating, integrating, and evaluating should be taught in the context of nursing process. Further, explanation and guidelines need to be given to assist students to learn problem-solving skills and decision-making skills in the framework of nursing process.

In addition, skill in using nursing process has been increased by the following measures: 1) guidance on how to use nursing process; 2) repeated drills using nursing process to formulate a plan of nursing care; 3) careful selection of

learning materials and nursing textbooks that support nursing
process; 4) other selected learning activities such as case
studies and direct clinical practice.

Cooperative Learning

Kagan (1989) notes "The most frequent reason for
individuals to be fired from their first job is not lack of
job related skills, but rather lack of interpersonal skills."
Kagan further notes that there is a socialization void in our
society today stemming from changes in family structure and
from television. In particular, television poises difficulty
in that (1) much of the content is antisocial, (2) advertising
fosters the belief that buying something will solve problems
rather than increased social skills, and (3) families interact
little or not at all during programs. Thus, young men and
women are coming into nursing programs with fewer and less
well used social skills.

The result of fewer interpersonal skills are calam-
itous for nursing. Leininger (1984) states that caring is an
important characteristic of nursing and is

"the direct (or indirect) nurturant and skill-
ful activities, processes, and decisions
related to assisting people in such a manner
that reflects behavioral attributes which are
empathetic, supportive, compassionate, pro-
tective, succorant, educational, and others
dependent upon the needs, problems, values,
and goals of the individual or group being
assisted."

In short, students can not accomplish one of nursing's major
role attributes without interpersonal skills.

Kagan divides interpersonal skills into task skills
and social skills. The task skills include those relating to
(1) agenda management such as setting an agenda, sticking to
an agenda, and managing time and (2) giving and receiving
ideas such as setting an open atmosphere, communication
skills, conflict resolution, and building on best ideas. The
social or maintenance skills include (1) encouraging and
appreciating such as seeking the participation of all and
processing feelings, and (2) guiding group process such as
checking for understanding and creating and assigning group
roles and responsibilities.

Dishon and O'Leary (1984) state "Cooperative
learning . . . is a model for teachers to use to teach the
skills necessary for effective group work." They identify five
principles that shape teacher behavior which in turn produces
desired student behaviors. Those principles are:

- The principle of distributed leadership
    All group members share responsibility for
    the functioning and leadership of the group.
- The principle of heterogenous groups
    In order to appreciate differences, groups
    must provide the opportunity to encounter

differences.

- The principle of positive interdependence
  All group members need to learn that they
  are dependent upon the other members.
- The principle of social skills acquisition
  The ability to work successfully in groups
  depends upon learning the necessary social
  skills which can be taught and learned.
- The principle of group autonomy
  Group members are more likely to solve
  problems if they are not rescued by the
  teacher.

The five principles of cooperative learning are activated
by the use of various structures that are recommended for the
development of cooperative skills, practice, and concept
development. For example, the use of task structuring and
reward structuring can foster positive interdependence and
address the knotty issues of individual versus group
accountability. Planned use of Self - Peer - Group - Teacher
evaluations will permit the students and the teacher to share
accountability.

Summary

Cooperative learning structures alone will not
achieve nursing curriculum goals. Rather, a blend of
structures that support cooperative, individual, and
competitive behavioral skills acquisition is desirable. The
greatest promise of accomplishing the task of producing
thoughtful, competent, caring nurses is through the planned,
deliberate use of case method exercises, critical thinking
skills instruction, and cooperative learning structures. Those
structures can be designed into theory presentation, into
campus-based skills acquisition laboratories and into clinical
settings.

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USING INTERACTIVE VIDEODISC TECHNOLOGY TO TEACH TECHNOLOGY

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Abstract

Interactive videodiscs combine the best of videotape, slides, audio, and computer assisted instruction into one comprehensive teaching module. This multimedia, multisensory activity assists students in technical fields work with expensive or dangerous equipment prior to on site practice. The decision making skills developed by the students from the videodisc activities transfer to the work site.

The use of interactive videodisc in technical fields is increasing with the introduction of more sophisticated software. Educators attempting to evaluate the material available need to have a basic understanding of this emerging technology. This presentation will describe interactive videodisc terminology; identify current research on student learning concerning time on task, cost effectiveness, and technological applications; and describe the parameters of our project to develop interactive videodiscs for re-entry nurses.

Interactive Videodisc Terminology

To assist in understanding videodisc applications, a basic understanding is required of the components, concepts and terminology. Interactive videodisc technology has been available for about ten years with hundreds of programs produced. As educators begin to explore the possibilities of videodisc applications, use has steadily increased. To provide for the most capability in interactive video, videodisc player and a computer that interface with each other are necessary. Some types of integrated videodisc computer systems are the Sony "ViewSystem"; the IBM "Infowindow"; and the Apple MacIntosh in which the text is presented in an overlay over the video pictures. A videodisc is a 12" plastic disc with the video pictures encoded in an analog format. The images on the disc are picked up by laser and projected onto the screen. The separate computer program directs the laser of the player to the appropriate cell on the disc and generates the text display. The videodisc provides storage capacity for either data or video. The videodisc has the capacity to hold 54,000 slides or 30 minutes of motion video per side.

There are different type of videodiscs recorded for different uses. The amount of interactivity available from a specific program determines the level of the disc. A Level I disc is controlled by a key pad that is attached to the videodisc player. Usually the small microchip computer memory is in the key pad or videodisc player. This type of disc is used like slides or short film clips. Faculty can plan their sequence of slides and movie clips to use for a class and preprogram it into the key pad for use the next day. Level II videodiscs have the computer program encoded onto them. The program is loaded into the player's memory or entered with a keypad. Interaction and branching is controlled by the program in the memory of the videodisc player. Examples of Level II discs are the commercial advertisements used in malls for directions and information. Level III discs are controlled by an external computer disk which provides an instructional program with text overlay and sequences developed in conjunction with the videodisc content. The learner can proceed at their own pace and interact with the program. The specific educational application desired will determine the level of videodisc needed for a program.

Addition videodisc terminology will help understand the parameters of the current technology. When videodiscs are made, they can be either CAV, CLV or CD-ROM format.

Constant Angular Velocity (CAV) is the format most commonly used for interactive applications. The 12" disc holds 54,000 video frames and rotates at a constant speed of 1,800 rpm, one revolution per frame. Each frame is identified and presented individually within a few seconds. Up to 30 minutes of motion video with sound is recorded on each side of a 12" disc and two audio tracks are individually or simultaneously played along with the video.

Constant Linear Velocity (CLV) is the videodisc format most commonly used for longer applications such as movies or concerts. The rotation speed varies from

600 to 1,800 rpm while maintaining a constant track length for each frame. This format allows for recording up to 60 minutes of motion video on each side of a 12" disc. However, this prohibits addressing or displaying specific frames by location so searching is limited to pre-encoded chapter stops. Some videodisc players save a CLV image in video memory and display it on the monitor. There is some degradation in access speed and image quality but it is effective for selected applications.

Compact Disc Read Only Memory (CD-ROM) provides a large capacity computer storage medium. CD-ROM is a 4.72 inch circular optical storage medium which is used to store data, numbers, and graphics. It holds over 500 million characters of information which are stored in a digital format. The CD-ROM is used primarily for large volumes of reference material such as dictionaries. Use of the CD-ROM disc requires a CD-ROM player hooked to a computer. Search software is usually included which allows the user to quickly locate information on the disc by responding to options on a menu. More recent mixed media versions are capable of delivering a variety of data types including limited video.

Authoring Systems are high-level computer programs based on a programming language like BASIC or Pascal, used for developing computer assisted educational programs. This allows for the integration of the computer based text, numbers and graphics with the video and audio from the videodisc player into an instructional program. Such a program reduces the number of instructions involved and translates these into a language resembling English. Some interactive videodisc authoring systems are Ten Core, Quest, Icon Author, and Showcase.

Interfaces are the devices for connecting a computer to the videodisc player. Some are a simple industry standard RS-232C serial cable, others connect to a parallel port, others incorporate video overlay capabilities. This allows superimposing/overlaying computer graphics, text and icons onto the videodisc image. A special monitor is required for overlaying. The interface needed depends on the combination of computer and videodisc player being used. Many applications can be very effective using separate monitors for the computer and the videodisc player. Such a two monitor system is the least expensive and does not require an interface which handles overlays.

By understanding the levels of interactivity and types of recording, it makes the information in the videodisc catalogues easier to match with specific educational applications. The levels and types of videodiscs are also an indication for the cost variance $50-$2500 for videodisc programs. The least expensive tend to be the Level I discs and the most expensive the Level III discs with more sophisticated programming. For example, if a faculty member wanted to develop a videodisc from the extensive slide collection what application could be used? A CAV, Level I disc, which would provide a complete index of the slides and quick access. If a faculty member wanted to purchase a disc for chemistry area that the faculty will repurpose with an authoring system, what would be appropriate? A CAV, Level 1 or 3 disc,

that could be repurposed using an authoring system. If a theater faculty wanted to purchase a package of video clips to be used in a theater arts course, what would be purchased? A CLV, Level 1 disc, that would allow the faculty to access the film clips. The level of interactivity and the type of videodisc recording are indicated on all the materials commercially prepared to assist in the knowledgeable purchase of the discs.

Learning Benefits

What are the learning benefits to students? How can the improve on traditional teaching methods? Rockley Miller identified the following ten learning benefits found from research in interactive learning technologies.

Reduced Learning time - Studies conducted to determine the reduced time using interactive video over traditional methods have found a decrease of approximately 50%. Some of the factors identified to assist in decreasing the learning time are that the format is easily understood, consistent reinforcement of concepts and content, and accommodates different learning styles. In self paced instruction students gain content mastery more quickly by using areas of strength and spending more time on weaker areas.

Reduced Cost - The cost per student is reduced as more students use the same program with the break-even point at 100-200 students. With traditional delivery methods, costs remain constant or increase as more students place greater demands on fixed resources. The greatest cost is in design and production to create a videodisc and in the investment in hardware to run the programs.

Instructional Consistency - The content and mode of presentation does not vary in quality from place to place nor does it become tired or have a bad day.

Privacy - The medium encourages students to explore, answer questions, and make mistakes without loss of esteem from peers or faculty. It also allows for privacy for topics that are difficult to explore openly.

Mastery of Learning - The interactive system does not move on until the content is mastered. Material is presented in alternate ways to insure that students have the basis for the subsequent topics.

Increased Retention - The interactive nature of the experience significantly increases the content retention over time. Studies have demonstrated an average of 25% improvement in retention.

Increased Safety - Students can view or use potentially dangerous substances in electronics, chemistry, and physics without risk.

Increased Motivation - The interactive system helps to focus attention and

provides corrective remediation that proves to be highly motivating to students.

Increased access - Videodisc systems deliver subjects in environments where equipment might be too expensive or qualified teachers are unavailable. Provides greater and more equal access to quality education.

Learners Enjoy Learning - Students have greater control and responsibility for their learning. They become seekers of knowledge not passive recipients of instruction.

Although the potential of interactive videodisc instruction is exciting, it is a another tool to assist with learning but not applicable to all situations nor to all types of learners. The administrator as well as faculty must be certain of the educational objectives when selecting videodisc programs to purchase or produce.

Re-entry Nurses Videodisc Production Project

The videodisc development project titled, "Enhanced Re-entry Nurses's Education using Interactive Videodisc for Assessment/ Instruction," has 71% grant funding from the U.S. Department of Education, Office of Vocational and Adult Education, Cooperative Demonstration Program (High Technology). The purpose of the videodisc is to assess the learning needs of nurses returning to nursing in re-entry program on the latest technological innovations in clinical settings. Nurses hesitate to come back into nursing after an absence due to their anxiety about their competence within the high tech hospital environment. The project goal is to provide a safe and individualized way to introduce nurses to the equipment and changed expectations in nursing as they return to clinical practice.

The project began in January 1990 and will be completed by June 1991. The Advisory Committee, representing two area community colleges and hospitals, has been extremely valuable in defining the content areas and providing guidance in the concept design. The input from the nurses in the practice areas helped the developers clarify what the problem areas were and what the re-entry nurses need as the final product. The committee identified three priority content areas: intravenous volume regulators, enteral feeding devices, and catheter management. The first set of discs will include material on intravenous volume regulators, specialty pumps, and different types if IV administration sites. The videodiscs will supplement the existing course which includes theory, skills and clinical practice. materials.

The production of the videotape with examples of common use and clinical problems is complete. The college nursing lab was used to shoot the patient situations using actors for the patients and nurses for the nursing parts. The production of the videotape which is the basis for the videodisc required preparation of the lab, gathering needed equipment and supplies, and refining the scripts. A subcontractor provided all the production and programming support for the disc development. Even with this support making a commercial quality videotape is

tedious work. The production took us five, twelve hour days to produce twelve reels of videotape. Our concept design for each of the videodiscs includes three chapters: one on hardware or basic content; the second on common clinical uses; and the third on common clinical problems. For every topic sequence, there are defined objectives, exercises and feedback, identified text remediation, and application tests. The development of the completed discs including editing, graphics, text and programming has taken five months.

To generate enthusiasm for this re-entry nurses project at other college nursing programs, two levels of support are identified. First, ten Peer Reviewers were identified across the country to review the initial program design and content outline to determine the broadest applicability of the content areas. Second, Pilot Colleges which are interested in interactive materials in the pilot form to be used with a group of students and provide feedback on the use of the videodisc. We plan to pilot the videodiscs in programs in preparation for implementing the materials in courses at two sites this Spring.

Faculty in technological fields need to investigate possible applications of interactive videodisc in their institutions. The learning benefits to the diversity of student learners make interactive videodisc an exciting learning tool for the future.

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COOPERATIVE LEARNING AND BIOLOGY

Florence Nash Rieken

Abstract

Cooperative learning techniques may be applied in the instruction of the biological sciences in the community college setting not ony to enhance social skills acquisition, but also to emphasize the scientific process in small groups. Examples are provided in process skills, content cooperation, whole class feedback, and evaluation, in both the theoretical and laboratory learning components.

Cooperative learning:

Cooperative learning models have four key attributes of positive interdependence (mutual goals, division of labor, division of resources or information among members, assigning students, joint rewards); face-to-face interaction among students; individual accountability; and appropriate use of interpersonal and small-group skills (Glatthorn, 1987). It is one technique that can be used in the teaching of biology.

Biology:

Biology is one of the sciences and science education is under fire as a result of national testing, national educational goals, and the focus of Project 2061 (Linn, 1987; Marquand, 1986; NSTA Reports! , 1990.p. 3). Science is both a way of knowing and a way of doing. To construct knowledge, to help with classroom management, to help improved self-confidence, and to introduce students to the cooperative enterprises of science and technology, cooperative learning use reflects the way scientists themselves work in teams. If the goal is a way of knowing, "a combination of cooperation and competition may be regarded as the best method of instruction in science classes fostering student achievement" (Okebukola, 1986a, p. 507). If the goal is a way of doing, and ". . . if improving students' attitudes toward laboratory work is the goal, the cooperative learning technique may be the means" (Okebukola, 1986b, p. 569.). "Science teaching can contribute to making science a part of students' lives, related to school for a while and then integrated into everyday life" (Hassard, 1990, p. x).

Approaches to Change:

To integrate the science of biology into everyday life, a change in approach may be necessary.

Changing science instruction to create a cooperatively structured classroom need not be difficult, but it probably won't be simple. There's a considerable difference between putting students physically into groups (merely rearranging desks) and structuring groups for cooperative learning (promoting positive interdependence and collaborative skills). (Johnson & Johnson, 1986, p. 32)

Instructors may be "overusing competition, misusing the individualized instruction approach and underusing cooperation in their classrooms" Abbott, Bates, Boyer, Broga, Lien, & Tostevin, 1986, p. 348). Emphasizing student-centered teaching strategies will lead to the treatment of science as a process rather than a collection of facts" (Abbott et al. 1986, p. 349). It may also change the role of instructor from information-giver to facilitator. (Sharan, 1990).

At the collegiate level, in overcoming obstacles in teaching large-enrollment laboratory courses, Leonard, Journet, and Ecklund (1988) state:

It is difficult for students to develop an understanding of science as investigation because years of high school training have taught them that science is knowledge and memorization for multiple-choice exams. Before they can fully appreciate complex hypothesis construction and refutation, they must gain practice and confidence in developing reasonable conjectures. Students must also learn to be comfortable with being wrong. (p. 24)

In the development of science processes, Leonard, Journet, and Ecklund (1988) include: exploring prior knowledge, experience, and interest; observing or consulting information sources; seeing patterns and making generalizations; making predictions, testing predictions; and re-evaluating the generalization (p. 24). However, they state:

the dominant mode of laboratory instruction in college introductory biology requires students to follow detailed, recipe-like instructions while making observations of biological phenomena. Students have little opportunity to mkae choices or think through a procedure. . . . [even though] the more science students are involved in the learning process (as active participants), the more they acquire science process skills. (p. 26)

Cooperative learning structures:

Whether in the theory or laboratory component of a biological science, selected cooperative structures may be used, even if one starts out on a small scale (Cooper, 1990). Roundrobin (expressing ideas and opinions) is useful for teambuilding; corners (seeing alternative hypotheses, values, problem-solving approaches) for classbuilding; numbered heads together (for review, checking for

knowledge, comprehension), color coded co-op cards (for memorizing facts), and pairs check (for practicing skills) for mastery. Concept development may employ the three-step interview (sharing personal information, reactions, and conclusions), think-pair-share (generating and revising hypotheses, inductive reasoning, deductive reasoning, application), and team word-webbing (for analysis of concepts into components, understanding multiple relations among ideas, differentiating concepts) (Dishon & O'Leary, 1964; Johnson & Johnson, 1987; Kagan, 1989; 1990).

Although a paucity of research incorporating science education in biology and cooperative learning at the communty college level exists, the potential use of this pedagogical technique is tremendous. Try it. You might like it!

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A CLASSROOM EXERCISE IN CREATIVE LIGHTING VIGNETTES

Margaret V. Wylie with Dorothy E. Miller

Abstract

This lecture/video presentation demonstrates a
classroom exercise in creating lighting vignettes.
Interior Design students gain practical experience
in composing their own projects and evaluating the
group projects of others. It synthesizes their
knowledge of lighting composition and specific
lighting techniques which complement the basic
principles and elements of design. Students
create group lighting vignettes, using found
materials. Students apply their knowledge of
lighting composition and specific lighting
techniques and basic design principles and
elements to their projects. Innovative group
projects require not only knowledge of design, but
the development of group problem solving and
communication skills which are favored by adult
learners and which are the core of the practice of
interior design. It reveals the students'
excitement and enthusiasm for the subject, and
their developing self-confidence encourages
innovation.

Introduction

This lecture/video presentation demonstrates a classroom exercise in creating lighting vignettes. Interior Design students gain practical experience in composing individual projects and in evaluating the group projects of others. It synthesizes their knowledge of lighting composition and specific lighting techniques which complement the basic principles and elements of design.

About the Students

The total number of Harford Community College Interior Design students enrolled in the day and evening sections of the Color and Light Course was 32 and included one male. Twenty seven were reentry or non-traditional age students, with the balance traditional age students.

Research has found that reentry women are highly motivated and often earn grades which are one grade higher than students of a traditional age. These women have life experiences from which to draw, but can lack self-esteem and confidence in approaching the college classroom experience. Working in groups has been demonstrated to be a successful and preferred method of learning for these women.

The Problem

Teachers of interior design, as those in other fields, have the responsibility to develop both knowledge and skills in their students. For example, a precise knowledge of historic and contemporary periods and styles promotes the ability to recognize and compare the sometimes subtle differences between furniture. Textile characteristics must be considered when selecting an appropriate fiber or blend and weave to suit a client's program. Mastery of drafting skills permits drawing a scaled line of the correct weight. A quick colored sketch allows a client to envision what a drapery treatment or a renovated kitchen might look like.

To create effective spaces, however, interior designers need to provide the mood and atmosphere the client desires. They must be able to predict and specify with certainty the furnishings, materials, colors and lighting which will assure that elusive element, satisfaction.

A lighting course should include technical knowledge and require creative applications of that knowledge. For example, students should understand differing terminology such as what a lumen, watt, and footcandle represents or measures, how to select a light source, i.e., either

incandescent lamps, which include halogen and low voltage, or gaseous-discharge lamps, such as low or high pressure sodium, fluorescent or metal halides, and know their optical characteristics, electrical efficiency and color rendering. However, merely identifying these terms or describing processes such as selecting fixtures and discussing and diagramming their beam shapes, or the effects of the different types of mounting, lenses and accessories does not begin to challenge students to apply this information in creative ways. Moreover, as time passes, specifications change as new materials are introduced into the marketplace.

So how can a teacher encourage experimentation and creativity in the classroom where there is little budget for lighting equipment, or nuture student confidence, and assess students' success with lighting an area? One workable method is the use of lighting vignettes.

The Classroom Exercise in Creating Lighting Vignettes

The exercise of student groups creating lighting vignettes in the classroom evolved to answer some of the concerns expressed by students: "Okay, we've passed the tests so we know we've got a lot of facts under our belt, but I'm not sure how everything might really turn out." "Now that we've done this great lighting plan and some calculations, how do we know what this space would really look like? Would it really work?" I could tell them only, "Yes, I really think so," or "Perhaps it's too overlit here," or "Maybe the footcandles need to be increased in this area of primary brightness or where you have this sculpture highlighted."

Listening to the students' concerns encouraged me to bring from my own home a variety of lighting sources and accessories to illustrate the principles I had taught. Initially I told these students to "play" with these materials and see what happens. I wanted them to discover the scope of their own creativity in developing special lighting effects.

From these informal learning situations, I developed the formal lighting vignettes which permitted both creative expression on the part of the students and a structured experience which I could assess consistently.

Students' grades are assessed according to each group's success in using the compositional techniques of achieving areas of primary and secondary brightness, and a touch of magic, as well as the use of specific lighting techniques. These techniques can include:

20

1. Highlighting--an object is lit with five times the amount of brightness in comparison with its background, which draws attention and affects where people sit and will move through a space.
2. Wallwashing--a wall is lit uniformly to unify various objects mounted on it, or to flatten its texture.
3. Beam play--clear glass lamps or gobos (stencils which are placed in lighting fixtures) allow the shape of light beams to form patterns on a less brilliant surface.
4. Shadow Play--the shape of shadows form patterns on a more brilliantly lit surface.
5. Silhouetting--an object is placed in front of a brightly lit area so that only its silhouette is seen.
6. Backlighting--a light source is placed behind a translucent material which diffuses and holds the light, allowing it to become luminous.
7. Structural lighting--lighting mounted or custom built into furnishings or architectural constructions such as beams and cornices.
8. Downlighting--overhead light which emphasizes horizontal surfaces.
9. Uplighting--a low source of light is directed up to emphasize a higher point of interest.
10. Grazing--overhead or uplighting close to a vertical surface which emphasizes the texture of that surface.
11. Sparkle--tiny light sources which add a festive atmosphere to the environment.
12. Light as Art--luminous art created from varying light sources and forms, such as neon.

Classroom Methods

One week before the vignettes are to be presented, the project is assigned. Students form into groups of three or four to brainstorm ideas and identify materials and props. They plan a lighting vignette of their own choosing, using the Design Process specific to interior designers, to define the Design Statement, e.g., "The purpose of this exercise is to create a romantic dining atmosphere for Susan and Todd Matthew's third wedding anniversary in their home in Bel Air," or "The purpose of this exercise is to use lighting as a means to attract and to draw people into a travel agent's office in the Harford Mall." This process promotes the development of group problem solving and communication skills which are favored by adult learners and which are basic to the practice of interior design. Each student is given a 3"x 5" card on which to write each group member's name and telephone number. This ensures ease and accuracy of communication out of class. At the end of the class, each group hands the instructor a card on which is written members' names and their Design Statement.

Subsequently, students work both out of class and during a second class period on the next steps in the design process, Research and Programming. The activities, needs and requirements of their hypothetical clients, as well as any external factors affecting the design, are researched, analyzed and written up as a Program, which directs the design solution. During the Design Development phase, students brainstorm ideas and select the best to implement the design.

On the day of the presentation, students bring their materials, props and lighting fixtures, never before seen by their group members, and create their vignette. They make an oral presentation to the class, and are critiqued by a member of another group.

Five video clips of the vignettes illustrate the process of setting up and experimenting to get "just the right look". This gives a feel for the time and effort that is expended to achieve the project theme, to collect the materials, lighting fixtures and props, to bring them from car to classroom and to arrange them, to present and critique the vignettes, and to take them apart and home-- perhaps all on a rainy day! The vignettes today include a sushi bar in a New York apartment; a foyer with an Oriental theme; a kitchen; a bedroom, and a travel agency. Vignettes not shown are a restaurant featuring candlelight and the silk ficus adorned with white Christmas lights for sparkle; a residential dining room with a Valentine Day's theme and candlelight, sparkle hearts and the uplit ficus tree; a gentleman's den and a lady's vanity area.

Innovation in these group projects captured the touch of magic. The classroom was transformed as whiteboards were draped with fabric to resemble wallcovered backgrounds; wallpaper borders were stapled to bulletin boards; desks arranged into a L-shaped grouping to simulate a kitchen, with an aluminum foil oval representing the sink, and metal graters sprayed a coordinating peach for lighting fixtures over the "counter"; a brocade Chinese kimono was suspended from a metal ceiling grid at an appropriate height for the sushi bar; the silk ficus tree from the instructor's office did quadruple duty as a prop for a variety of lighting techniques, including uplighting, shadowplay and a touch of magic. In addition, a wall-hung silk rug from Persia spotlit with red/orange colored lighting, and uplit ficus trees, transformed the foyer of the classroom building into an exotic environment for the travel agency office.

Recommendations

Vignettes may easily be adapted to other activities in the Interior Design curriculum. In fact, this lighting

exercise is a spinoff from an original classroom exercise in creating an accessory grouping for the Introduction to Interior Design course.

This type of exercise is particularly well suited to the reentry student who typically takes the interior design courses at a community college. These students often have experience in decorating a home and have many more resources to call upon than the traditional age student. The bedroom vignette illustrates this principle. It was the only group composed of all traditional aged students and the only vignette in the nine presentations which showed a lack of depth and complexity of lighting composition and specific lighting techniques.

The enthusiasm and confidence generated a year ago by first-year students from this exercise remains today. "Lighting is really exciting and I'm conscious of its effects everywhere I go." It revealed itself in the extra research, attention to detail and pizzaz shown in their projects last semester, and in the excitment they express as they describe what they have done in their own homes and in other interior environments. It has become a love affair students say they never will give up.

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HEALTH ISSUES IN THE 90S

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Abstract

The decade of the 90s promises to be oriented more towards health promotion and disease prevention. In order for this to happen, education is the first step in developing and reinforcing positive behaviors and attitudes towards self health. Addressed in this presentation will be health related issues of the 90s and health promotion strategies for use in the classroom.

Introduction

In my years at Prince George's Community College, I've been fortunate to participate in administration, a grant supported project and teaching. Over the years, my teaching responsibilities have always been in nursing. For the first time this past semester, Fall, 1989, I ventured into new territory.

Two recent events contributed to this adventure. The first occurred several years ago when I participated in the Fipse supported project, Integrating Scholarship Across the Curriculum. Presentation of the project results was part of past AFACCT Conferences. For me, issues related to scientific research, health and specificially women's health emerged as critical concerns. The second event took place after Prince George's Community College emphasized faculty development and created mechanisms to support faculty innovation and creativity. The two factors, the Fipse project and PGCC's initiatives for faculty development came together for me last semester.

At Prince George's Community College we have a wonderful course for the promotion of health. No one from nursing ever taught the course and I never taught courses other than nursing. Using what I learned in the Fipse project and supported by the college's initiatives, I forged ahead. Last Fall semester, for the first time I taught a course outside of nursing.

I approached this new undertaking with a mixture of caution, adventure and excitement. I ended up having an absolutely superb time! So much so that I am scheduled to teach the health course again this semester and, in Fall, 1991, plan to contribute to an expansion of course offerings by developing and teaching a women's health course.

This health course gave me the wonderful opportunity to combine my background in the profession of nursing the sick with

my new found interest in health and wellness. As a result of my experiences with the Fipse project, the health course and nursing, I am more convinced than ever that we must take control of our own health and focus more on the prevention of disease.

In this session, Health in the 90s, I will identify the problem, provide some statistics and then relate the issue of health to our classrooms. By the end of the session, you will have some ideas to apply to the "health" of your classroom and possibly to your own health.

Health Related Issues of the 90s

In January, the Washington Post carried an article by Michael Schrage in which he discussed "bionarcissism." He identified this as "the single most important force now transforming technology, innovation and pop culture." A bionarcissist is defined by Schrage as a person who is "relentlessly absorbed with their own sense of physical well-being." Examples given to support his notion include the high cost people are willing to pay for health care; the growth of medical technology to support life; concerns about the use of life-support technology; environmental concerns and the animal rights movement. Major concerns exist about the quality of life.

This notion is further supported by the growing number of health magazines, diet foods, diet publications, health related advertisements, athletic clothes, athletic stores, fitness equipment, fitness videotapes and spas. Our health and how we look is also big business.

Quality of life and the related ethical issues is taught in my nursing courses with the focus primarily on the patient, not the student. In this health class I decided to focus on student behavior and its contribution to the quality of their own lives. I placed the major emphasis on prevention of disease and promotion of health with less attention on the treatment of disease.

Behaviors Contributing to Health Problems

I will use examples from the health class to illustrate behaviors which contribute to health problems. Demographically, in this class the age range was approximately 20 to 50 years, with the average age being 25. Five students were married and 4 had children. There were 13 females and 4 males. All identified an interest in their own health as a reason for taking the course.

When we talked about their lifestyles, a clear picture emerged about priorities and use of time. Students were waking between 4 a.m. and 6 a.m. and averaging 6 to 8 hours of sleep per day. Breakfasts consisted of microwaved hot dogs, cold cereal eaten while standing watching television, and fast food or doughnuts eaten while driving to work. Some had no breakfast and

some ate breakfast after arriving at work. Lunch was nonexistent, "eaten at my desk," or "purchased from the vendor across the street." A few students took lunch of sandwiches, chips and/or fruit. Dinners consisted of microwaved packaged dinners, fast food of hamburgers and french fries, or was not eaten at all. No one spoke of going to restaurants other than fast food establishments.

Exercise included aerobic classes, the gym, hiking, bike riding and using the steps instead of the elevator. The statement "if I have the time" often accompanied the activity. Only one student admitted to being a former cigarette smoker and none admitted to being active smokers.

Where was their time going? Obviously it was not spent eating or exercising. Answers were work, school and transportation. Many said they were not aware of the dangers associated with their lifestyle, especially related to food. Some of the students realized their eating habits and food choices could be improved but considering their time constrictions, did not know how to change or what to eat. All agreed stress was a major factor in their lives, demonstrated by behaviors such as nailbiting, excessive coffee drinking, inability to sleep, and being irritable with others. Several attributed their absences from class to stresses in their lives, such as a grandmother being hospitalized or having to work overtime. Seventy per cent of the students had three or less absences and indicated attending the class was important to them.

These examples are from one class in one semester but we know their life style is replicated by large numbers of people. We also know eventually this life style can lead to a breakdown of the human body, mind and spirit. This certainly does not enhance the quality of life. These students admitted to wanting to improve their lives and were concerned with their physical well being. They were very receptive to what they could do to improve their own health.

When I teach nursing, I see many patients who are dealing with a breakdown to their health. These are the same health breakdowns that can touch the lives of our students. Many of these breakdowns can be avoided with proper knowledge and appropriate lifestyle changes.

Health Disorders and their Prevalence

The following health related information and statistics further emphasize the problems:

1 in 500 college students is HIV+, that is, carrying the AIDS virus.

The incidence of sexually transmitted diseases (STDs) is on the increase.

Every year approximately 1.1 million girls become pregnant; 45 percent undergo abortions. In the past, most teenage mothers were married. Today most are not.

An increasing number of medical researchers now believe that stress is our number-one health enemy and the greatest single contributer to disease.

Recently, I received an advertisment for films to use in the classroom. The subject matter of these films provides a concise summary of current health issues plaguing our society. Examples include: teenage pregnancy, stress, smoking, drugs, alcohol and mental illness.

So far, the emerging picture from the literature, marketplace and classroom tells us that people say they are concerned about their health and well being but are not living lives which contribute to promoting health, preventing disease and enhancing the quality of their own lives.

Health Promotion Strategies for Use in the Classroom

Can our classrooms make a difference? I believe it is a beginning. Let me suggest some ideas.

Environment is one of the many factors contributing to health. Our classrooms can be hostile or friendly environments which can contribute to increasing or decreasing stress levels. The more comfortable learning environment reduces stress and enhances the student's ability to learn.

As faculty, we represent authority and have the accompanying power. We are also the recipients of many responses such as fear, respect, hostility, anger, trust and distrust. Some of these are appropriate and some are not. In relationships with students in our classrooms, we can turn students on and off to learning, depending on how we work with them.

We can be receptive to student's concerns. This does not mean solving the problem for them but listening to them and helping in problem solving. I am sometimes approached by students having a variety of health problems but I do not give therapy, treatment or abandon them. What I will do is refer them to the proper person or facility, such as the health room on campus.

Another way we can be supportive of students improving their health is to encourage their participation in health related activities on campus, such as drug or alcohol awareness days. If appropriate to your course material, you might consider giving credit for participation in such events.

Another avenue is supporting the vending machine companies that make nourishing foods available for students. There is an

increasing number of vending companies who supply popcorn, apples, juices and pretzels which are much more nourishing than candy bars, potato chips and cheese crackers.

We must be alert to being role models and setting an example by our own behavior. Our own health habits such as eating, drinking coffee and/or soft drinks, personal hygiene and appearance are carefully scrutinized by our students. Showing interest in students can decrease their stress and increase their mental health. Students who are successful feel better about themselves and have more self confidence. We can contribute to this.

I had an interesting experience at the end of the health class. Throughout the semester, I tried to convey my own feeling that each student was important and this class mattered. I truly believe this. The week before the final exam, we discussed reactions to the class. The time passed quickly. Before we knew it the clock indicated the class was over but no one moved. Everyone continued to talk. This was very unusual since the standard operating procedure for the entire semester was to start on time and end on time. Five minutes over the ending time, I pointed out the time. Finally one student said "I guess you can see how much we enjoyed the class because no one wants to leave." Since grades were based strictly on objective examination scores, I had to believe the comment was genuine, the class was special and the students did not want it to end.

Aside from our own role, we can attend to our classroom environment. We can try to decrease noise pollution, have good lighting, and give students room to move around.

Our lives can become enriched when we encounter motivated, enthusiastic students who care about themselves and their own learning. I find that when I clearly show positive interest in what my students say in class or to a patient, my students become more alert and responsive. Their voices and faces reflect emotion and concern. They are involved in their own learning.

Would you like to be a student in your own class? Would you be turned on to learning? Would you want to take another class with you as the teacher? How would you feel during and after the class: inspired, challenged, excited, overwhelmed, anxious, frightened? Would you emerge less or more sure of yourself? All of these reactions contribute to raising or lowering a student's sense of well being.

I recognize there are many stressors impacting on the lives of our students. However, I submit that faculty can play a major role in promoting health and contributing to the quality of life of our students.

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SUCCESSFUL MARYLAND METHODS OF CLASSROOM RESEARCH

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Abstract

Three Maryland Community College faculty members and two administrators who teach were trained at the Faculty Development Institute Workshop on Classroom Research in Berkeley, California in June of 1990. During the Fall, 1990 semester, each has experimented with various forms of Classroom Research finding efforts exciting and rewarding. The presentation, Successful Maryland Methods of Classroom Research, includes a summary of each member's experiences, a video tape of examples of Classroom Research and an overview defining Classroom Research.

Classroom Research Defined

The label Classroom Research is an umbrella term for various assessment techniques teachers can use to increase learning by finding out WHAT and HOW students learn. The RESEARCH part of the term should not frighten off the uninitiated. Statistical compilations and control groups are not part of this notion. Classroom Research as conceptualized by Pat Cross and Tom Angelo is simple in design, easy to use, and substantial in profit.

Classroom Research assumes that one of the most promising ways to improve learning quality is to encourage and enable faculty to develop methods to assess the effects of their reaching on student learning. The methods (called C.A.T.s or Classroom Assessment Techniques) are straight forward, learner centered, teacher directed, continuous, and self-renewing. Techniques can be as simple as asking students to respond to a single question at the end of a class period. The purpose is for the teacher to discover something useful about learning what will facilitate improved teaching. The results of Classroom Research are, therefore, most appropriately used by the teacher and are note intended to be used for formal evaluation purposes.

Classroom Research is based on seven (7) assumptions:

- —that learning is directly related to teaching;
- —that improvement of teaching is based on student feedback;
- —that improvement of learning is based on student's receiving feedback;
- —that the beat method of soliciting and obtaining feedback is for a teacher to create questions for his/her own classes;
- —that Classroom Research is a powerful source of motivation, growth, and renewal;
- —that Classroom Research is not mysterious, esoteric (as educational research can be) but is best entrusted to dedicated college teachers; and
- —that Classroom Research is more often qualitative than quantitative.

Examples

English Professor

Classroom Research can measure student awareness. One English professor, using peer evaluation as a method of helping students refine their writing, asked students at the close of one peer session to record their response to two questions:

- —What did you learn today from others that will help you improve your writing?
- —How did you help others in your group to improve?

The professor discovered that some students hadn't previously realized their responsibilities to their peers. They simply couldn't answer the second question. She found she needed to be more specific in her instructions. Through using this new information, students achieved much more productive peer evaluation sessions AND student essays improved.

Psychology Teacher

Classroom Research can measure if students are applying what they are learning. On psychology teacher wondered if students applied course material to their lives. Following a three week unit on human learning in an introductory course, he asked:

- —Have you applied anything you have learned in this unit to your own life?

Twenty-two out of thirty-five students responded affirmatively, but several didn't realize they should be applying concepts. He had the class invent as many application as possible and repeated that exercise after each unit. Students began to make stronger associations and retain material better.

Aerobics Instructor

Classroom Research can assess goals in a course. An aerobics instructor wondered why her attrition rate was high. She asked students to write and then rank their goals for taking the class. She discovered their primary goals were to "improve self image" and "reduce stress". She had been teaching the class assuming students were primarily wanting to "get in shape and/or lose weight". She realized her method of increasing the difficulty of the routine each week lowered students' self image and increased their stress. She made the more complicated routines optional and retention increased.

Science Instructor

Classroom Research can measure the consistency between the teacher's goals and the students' reasons for taking the course.

At the first class meeting, a science instructor asked the students to write four personal goals for taking the course. The instructor then presented her course goals to the class. Together they developed a common set of goals. This experiment allowed the students to claim some ownership in the class and gave the instructor an appreciation of the diversity among the students.

At mid semester, a survey instrument was administered. Several items referred to the course goals. The student was asked if he/she had made progress toward meeting the common goals. Another asked how the instructor could facilitate the process.

General Psychology Instructor

Classroom Research can assess student reaction to teaching style and methods. A general psychology instructor surveyed his class four times during the semester. The intention of each survey was to provide immediate feedback regarding student perception of the classroom experience. The use of several survey instruments during the semester served to measure changes in his teaching methods. His surveys included:

--What has been the hardest part of this course?
--How efficiently do I organize and use class time to promote
   student learning?
--You expressed as desire to have a change in the way we
   review. Have you noticed a satisfactory change or hasn't
   enough been done?

The results of using four progressive surveys by the psychology
instructor were changes in teaching methods that students evaluated
as facilitating a more positive and "unique" learning experience.

Math/Graduate Education Instructor

Classroom Research can assess daily effectiveness of teaching. A
graduate instructor in education who also teaches a developmental
math study skills course used similar techniques for both groups
to assess student reaction to teaching methods and course content.
During the final five minutes of class, students were asked one of
the following:

--What was the most confusing point in today's class?
--What is the most important concept you learned in class
   today?
--In two minutes, summarize what you learned about _____.
--What did we do today that was the most and the least helpful
   in learning course concepts?
--What changes in teaching strategies could help you learn?

Responses from students were used to plan reviews, alter teaching
methods and systematically use student feedback to improve learning.
Ultimately students evaluated the "final five minutes" techniques
and the result was that both graduate and developmental math students
recognized that daily response to learning improved both teaching
and learning. Graduate education majors reported successfully using
adaptations of these Classroom Research techniques in elementary
through college levels.

English Composition Instructor

Classroom Research can assess the value of collaborative learning
strategies. After assigning group research projects and using
collaborative teaching methods, an English Composition instructor
included daily group work progress reports, individual mid-course
evaluation and correction, individual course participation
observation and quantification, oral and written draft previews
and critiques, written commentary and points on papers, weekly
instructor/group conferences, group reflection and evaluation, and
an individual reflection and evaluation of the project as a whole.
Each technique provided data on teaching and learning. Each resulted
in changes in student and teacher behaviors.

The English Composition instructor used qualitative, observational and quantitative questions about all aspects of the course three times during the semester.

> --Qualitative: Discuss your participation in all aspects of this course this third of the semester. Be very specific.
> --Quantitative: Quantify your participation in this third of the course (1) love to (10) high.
> --Observation: Reread what you have written above. What do you observe about your own learning process?

The results of Classroom Research techniques being integrated into collaborative learning strategies was students saw the group research project as a "positive" educational experience, both as process and as product. The English Composition instructor improved teaching strategies and "shaped the context" of a course in first year English Composition.

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HAZARDOUS CHEMICAL WASTE REDUCTION:
SOLUTIONS FROM A CHEMISTRY DEPARTMENT

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Anne Arundel Community College

Abstract

Institutions of higher education are faced with the need to decrease the amount and costs of hazardous waste materials. Education and training of faculty, staff and students of the chemistry department of Anne Arundel Community College in hazardous waste and its disposal have resulted in reducing wastes and costs of disposal by nearly 50%. Steps toward waste minimization include introduction of microscale techniques in organic laboratory experiments and built-in procedures, such as neutralization of unused acids and bases by the students.

Producers of hazardous wastes include not only large businesses such as chemical and manufacturing plants, but small ones as well. In recent years, science departments of universities and colleges have increased their awareness of hazardous waste resulting from laboratory experiments performed by students as they move through their academic program. Institutions of higher learning can no longer readily dispose of wastes from these experiments by traditional methods. Beyond that, costs for commercial waste disposal run as high as $12,000 per institution per year. The chemistry department of Anne Arundel Community College has instituted measures to involve and educate the faculty, staff and students in safe disposal methods and to decrease production of hazardous wastes without compromising the educational quality of the institution. Other college departments, such as art, biology, photography and the print shop, have joined the scientists in these efforts.

The Environmental Protection Agency (EPA) now regulates hazardous waste under the Federal Resource Conservation and Recovery Act (RCRA) of 1980. A "cradle-to-grave" management strategy ensures that waste is sent to, and arrives at, a licensed disposal facility. As EPA learned more about the problems, they turned to "waste minimization", that is, the elimination of waste before it is produced and requires disposal. Experts estimate that up to one-third of all hazardous waste can be eliminated in this way. Waste minimization includes both "resource conservation"

(decreasing quantities of or substituting materials needed to complete a task) and recycling.

In response to EPA regulations regarding small-quantity generators (1985), a hazardous waste committee was appointed by the President of Anne Arundel Community College in 1987. The following year, a document detailing the waste management scheme was prepared and a contingency plan developed for emergency situations. The chemistry department has explored new and creative ways to reduce its hazardous waste. The best suggestions have come from those who know the institution, its educational goals and the means by which they are reached. The changes range from very simple techniques performed by the students, to the introduction of microscale techniques in three organic courses. These efforts have reduced the waste by 46% from 1988 to 1989.

A summary of the waste reduction efforts by Anne Arundel Community College follows:

* Microscale organic experiments replace larger scale procedures used by undergraduates. For example, 0.5 ml of a reactant is used instead of 58.5 ml. The microscale technique typically uses one-tenth to one-thousandth the amount of materials in traditional procedures. In addition to decreasing hazardous wastes, the microscale method reduces the following: a) cost of chemicals; b) air pollution; c) human exposure to chemicals; d) the risk of accidents. Furthermore, the time required to complete experiments is reduced substantially. This benefits both the teacher and student since more time is available for instruction and learning. Additional experiments can be assigned or procedures done in duplicate or triplicate to improve results.

* The quantity of unknown samples distributed in several chemistry labs has been reduced to the exact amount needed for the procedure. Previously, each student was given additional unknown material in case a second or third attempt was needed to complete the analysis. Additional material is issued now only at the request of a student.

* Students are instructed in the mechanics of rinsing hazardous materials, from glassware to waste containers, using the least amount of liquid. The container with the largest amount of liquid is stirred well and poured into the second container. This is repeated, moving through the appropriate containers, with the result that a small amount of liquid can be used to rinse many test tubes.

* Students neutralize excess acid and base solutions as part of the experiment and the resulting salt is then safely rinsed down the drain. This has enhanced the students'

awareness of waste management and gives them additional experience with pH measurements. It should be noted that this same procedure, carried out by the technical assistant, is classified as waste treatment and, as such, is prohibited. When performed by the student, it becomes part of the experiment and acceptable to regulatory agencies.

* Recycling of products from student experiments has been introduced and additional possibilities are being explored. At this time, solids used in recrystallization experiments and liquids from distillation procedures are recycled for use by students in the following term.

In addition to waste minimization, the college has provided financial support for faculty and staff to attend hazardous waste courses and workshops on the microscale technique. Continued support will be needed for ongoing education as more information becomes available. Besides the immediate benefits of producing less waste, Anne Arundel Community College is concerned with educating a population which will share the responsibility of ensuring a clean, healthy environment in the future.

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Hazardous Waste Management: Putting Solution into Place. (1988, August) Chemical Week. pp. 26-36.

Person to contact:

Dr. Sridharan S. Iyengar
Science Division, Anne Arundel Community College
101 College Parkway
Arnold, MD 21012
Phone: (301) 541-2260

DOVE: A SPACE SATELLITE
DESIGNED TO BE OF INTEREST TO
STUDENTS IN GRADES K-12

Martin Davidoff, Ph.D.
Catonsville Community College
Catonsville, MD 21228

Abstract

In January 1990, after more than 30 years of space activity, the first satellite expressly designed for use by educators working with students in grades K-12 was launched. The spacecraft, called DOVE, was built by a group of volunteers, mostly scientists and educators sharing an interest in Amateur Radio, and placed in orbit by the European Space Agency. Signals from DOVE can be received directly in the classroom using very simple radio equipment. This paper focuses on the DOVE project and a number of related science education issues.

Objectives

The primary objectives of this talk are to:

1. Provide information about the DOVE spacecraft and how it can be used in the classroom (including college level science courses).
2. Tell the story behind DOVE -- who built it, where the money came from, etc.
3. Enlist the assistance of community college faculty in disseminating information on the DOVE project to local K-12 educators.

The secondary objectives of this talk are to:

1. Look at several government initiatives to stimulate science education.
2. Discuss why these initiatives are often ineffective.
3. Look at several non traditional initiatives to stimulate science education and comment on their effectiveness.

Attachments

1. DOVE Information Sheet #1: What is DOVE?
2. DOVE Information Sheet #2: How To Use DOVE
3. DOVE Information Sheet #3: DOVE fact sheet

WHAT IS DOVE?

DOVE is a small earth satellite. To young students and their teachers it's a very special spacecraft because it was designed expressly for them. Each morning, as DOVE passes overhead, it broadcasts brief messages. Using a simple radio receiver students can listen to these messages in the classroom. The DOVE spacecraft is an international resource freely available to students and teachers in all countries.

Audio tapes submitted by student groups around the world form an important component of DOVE broadcasts. These tapes generally focus on peace, brotherhood, and efforts to preserve the beauty and resources of planet earth.

The Objectives of Project DOVE include:

* Stimulating student discussions relating to Peace, Brotherhood, and Environmental Preservation;
* Exposing young students to an activity that relates technology and science to the pressing social issues facing all people;
* Disseminating information on the peaceful uses of space.

It is hoped that DOVE related activities will: encourage many youngsters who would not otherwise do so to consider a career in science; raise the social consciousness of youngsters already heading toward a scientific vocation; and foster an awareness of the close connection between science and social issues in students and educators who come in contact with the project.

Taking Part in Project DOVE

The radio equipment needed to receive DOVE in the classroom is very simple and widely available. Most police/fire scanner radios will do the job. A note in your PTA newsletter will probably turn up a loaner to get you started. An information packet which provides details on receiving signals from DOVE is available (DOVE Information Sheet #2). For additional information contact: Rosalie White, ARRL Educational Programs, 225 Main St., Newington, CT 06111.

40

DOVE Classroom Activities

It's convenient to divide DOVE classroom activities into those that
focus on science topics and those that focus on social/cultural topics.
The following examples are suitable for grades 5-9.

Science activity example. Draw a rough scale drawing on the board
showing the relation between the following distances: height of highest
mountain on earth (~5 miles), height of DOVE satellite (~500 miles), radius
of earth (~4000 miles). Refer to a globe or map to find cities at these
three distances from your classroom. Using a globe you might discuss why
signals from the satellite can only be heard when the spacecraft passes
nearby (The radio signals travel in straight lines and cannot go through
the earth).

Social/Cultural example. Suggest that the class prepare a brief audio
tape for possible transmission by DOVE. (When the spacecraft becomes fully
operational these messages will be broadcast daily). The tape might focus
on describing a local activity or holiday related to peace, brotherhood, or
environmental preservation to classes in other countries. Another possible
theme is to prepare a multilingual greeting to classes around the world by
having students contact parents and friends to gather appropriate short
phrases in as many languages as possible. This activity could be used to
increase awareness of and pride in the diverse cultural heritage in the
United States and an interest in foreign languages.

Although DOVE's designers have accumulated a collection of classroom
applications we expect that teachers will come up with many excellent ideas
that were never anticipated. We would greatly appreciate it if you would
share these ideas with us. Keep in mind that DOVE is truly your satellite;
insofar as the laws of astrodynamics permit, the content and scheduling of
broadcasts will be adjusted to conform to your needs.

DOVE Past/Future

DOVE was produced as a cooperative project between AMSAT-NA (AMSAT
North America) and BRAMSAT (AMSAT Brazil). AMSAT is a registered trademark
of the Radio Amateur Satellite Corporation, a group of volunteers who have
overseen the construction and launch of 15 satellites since 1970. The DOVE
concept was conceived by Dr. Junior de Castro, president of BRAMSAT, and
was initiated almost entirely due to his efforts. DOVE is an international
resource available to teachers in all countries without charge.

DOVE was successfully launched on Jan 22, 1990. The design lifetime
is seven years. AMSAT is committed to provide additional spacecraft in the
series if the educational community demonstrates support.

Funding for construction and launch of the DOVE spacecraft was
provided by BRAMSAT and AMSAT-NA. Since many of the scientists, educators
and radio amateurs who worked on DOVE were volunteers and the European
Space Agency provided a launch at low cost, the cash outlay for DOVE
amounted to less than $100,000. The procurement price of a comparable
commercial spacecraft has been estimated at about $1,000,000.

[DOVE Information Sheet #1, 20/9/90, M. Davidoff]

HOW TO USE DOVE

Introduction

Because the radio frequencies used by DOVE only travel in straight lines DOVE can only be heard when it passes nearby. DOVE circles the earth about 14 times per day at a relatively low height for a satellite -- about 500 miles. As a result of its orbit DOVE will pass near any location on earth two or three times each morning and another two or three times each evening. These "passes" generally last about 15 minutes. The morning passes, which are especially suitable for classroom use, occur between 9am and 1pm local standard time. The evening passes occur between 9pm and 1am local standard time.

Radio Receiver

DOVE operates on a frequency of 145.825 MHz. This frequency can be received by most of the low cost scanner radios used to monitor police/fire/emergency radio services. It can also be received by many Amateur Radio receivers. Since DOVE produces a relatively strong signal most radios will work well just using the attached whip antenna if they're positioned near a big window. If your classroom is in the interior of a big building where regular am/fm broadcast band radios don't work you probably will not be able to hear DOVE unless you use an outdoor antenna.

Once you obtain a radio set the tuning control or channel selector to 145.825 MHz. Turn the squelch control to off (or set it at the lowest level) and adjust the volume so that the background noise is annoyingly loud. Carefully set the squelch control just past the point where the background noise disappears. Now turn to some other work -- when the satellite passes nearby the radio audio will automatically turn on. If you note the time you'll be able to predict the time for the next pass, and for passes the following day, using the approach discussed in the last section of this information sheet.

Obtaining a Radio

The easiest way to receive DOVE is to use a police/fire scanner receiver. You'll need a radio that can be tuned to 145.825 MHz. Most scanners can just be set to this frequency but a few of the inexpensive units require the user to purchase a crystal for each frequency. A very large number of receivers of this type have been sold over the years and many have been placed in storage on the back corner of a closet shelf. A request to your classes or a note in your PTA newsletter will often turn up one of these units as a loaner or donation. You might also try asking at a local Radio Shack store to see if they're willing to provide the school with a loaner. Receivers designed for the Amateur Radio two-meter band are also suitable.

Listening Hints

Although the main purpose of DOVE is to transmit voice messages for educators it will be used at times, especially during it's early days in space, to transmit telemetry information informing the satellite designers how the spacecraft is working. The sound of the telemetry is easy to recognize but hard to describe -- something like a melodic machine gun.

When you hear a pass note the time. If the pass is in the early part of the morning 9am - 1pm window (or the evening 9pm to 1am window) you should be able to hear the next pass which will begin about 100 minutes later. If you hear the start of a pass one day note the time. You'll probably be able to hear a pass begin about 29 minutes earlier the next day.

The prediction hints just listed are one approach to satellite tracking. Tracking is not necessary with DOVE if you're willing to just leave the receiver on until signals from the spacecraft activate the audio. More sophisticated approaches to tracking are available. Highly accurate graphical tracking devices can be easily and inexpensively prepared using a polar map. Full details were presented in a recent issue of the AMSAT Education News, R. Ensign, Editor, 421 N. Military, Dearborn, Michigan, 48124. A Self Addressed Envelope with two units of postage will get you a sample issue -- ask for the one with the tracking Oscarlocator for DOVE. If you have a small computer in your classroom you can turn it into a tracking device that rivals the pictures you've seen of the mission control center at Johnson Space Center in Houston using inexpensive software from AMSAT. To obtain a list of what's available send a self addressed stamped envelope to AMSAT, Box 27, Washington, DC 20044, and request a copy of the current tracking software list.

As of November 1990 there is a second satellite (UoSAT-OSCAR 11) using the frequency 145.825 MHz which you may hear. The signal is considerably weaker than DOVE. This satellite usually broadcasts telemetry signals during the week and voice on weekends. The voice synthesizer uses a single voice and a limited vocabulary. It cannot record and playback student messages.

Scanner receivers used to monitor DOVE can usually also be used to monitor other interesting space activities. For example, at times the cosmonauts aboard the MIR space station use 145.500 and 145.550 MHz to talk to radio amateurs in the United States as MIR passes overhead. In addition, nearby frequencies have been used by radio amateurs operating from US Space Shuttles during several missions. Information on these activities can be obtained from AMSAT Education News (address listed earlier).

[Dove Information Sheet #2: Using Dove. 20/11/90]

DOVE fact sheet
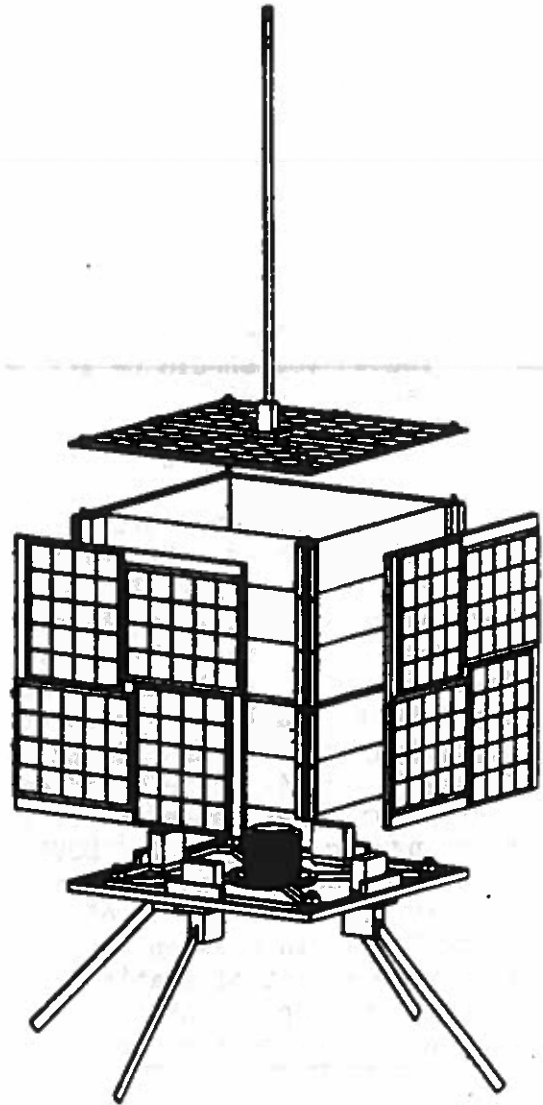
Launch

    Date: 22 Jan. 1990
    Time: 01:35:31 UTC
    Vehicle: Ariane (version: 40,
      family: 4, mission: V35)
    Agency: ESA
    Site: Kourou, French Guiana

Orbital Parameters

    General designation:
      low-altitude, circular,
      sun-synchronous, near polar
    Period: 100.8 minutes
    Mean altitude: 800 km
    Eccentricity: 0.0012
    Inclination: 98.7 degrees
    Longitude increment: 25.3 deg. west per orbit
    Maximum access distance: 3038 km

Construction Credits

    Designed and constructed by AMSAT-NA (Radio Amateur Satellite
Corporation of North America, PO Box 27, Washington, DC 20044).
Primary financial support provided by BRAMSAT (AMSAT Brazil).

Physical Structure

    Shape: Cube ~23 cm on edge
    Mass: ~ 9 kg

[Dove Information Sheet #3, 11/20/90, DOVE fact sheet]

ADDRESSING CULTURAL DIVERSITY
THROUGH CROSS-CULTURAL FACULTY DEVELOPMENT

Dennis S. Bartow

Abstract

The credit student profile at Prince George's Community College has undergone a dramatic demographic transformation over the past two decades. In 1970, 89 percent of our credit enrollment was white, and well over half, male. In 1990, only 46 percent of our credit students are white, 47 percent are black, with an additional 7 percent made up of asians and hispanics. White male students have become almost an endangered species at our college, currently comprising only 18 percent of the student population. In 20 years, PGCC has been transformed from a predominantly white college into an institution that serves a truly culturally diverse population.

The dramatic student demographic shift has not been reflected in a corresponding shift in faculty and staff demography. Despite a strong affirmative action program, the minority percentage of our full-time faculty has reached only 14 percent (10 percent black), although minority representation among our part-time faculty has now risen to 29 percent. The growing racial disparity between students and faculty has challenged this institution to respond to some serious human relations and curricular issues.

One of PGCC's most successful initiatives has been our development of a realistic and effective affirmative action plan. A minority affairs administrator (who is a black female) serves as a member of the president's staff, and participates in cabinet-level discussions and decision-making. This administrator (Assistant to the President for Minority Affairs and Affirmative Action) is an ex officio member of all professional level review/screening committees, and has the authority to determine that a search must be re-opened in cases when the pool of minority candidates is not representative of the area's minority availability indices. Despite these steps and the active commitment of the faculty and administration, we recognize that it will be many years before the racial gap between students and faculty is significantly reduced. Let me give you several reasons for this pessimistic prediction.

1. Representation of qualified minorities in faculty and professional staff applicant pools is limited by the low numbers of minority advanced degree holders.

2.   Competition from wealthier and more prestigious
      institutions for well qualified minority faculty.

3.   With 78 percent of our faculty tenured and an
      average faculty age of about 45, there likely will
      be limited turnover and few vacancies in existing
      faculty lines for years to come.

4.   Budget constraints preclude our opening new
      faculty lines in departments that are under-
      represented in terms of minority faculty.

Part of the rationale for recruiting and hiring minority
faculty is based on trying to provide minority role models
for our students. Although minority students seek and may
benefit from professional-level role models drawn from their
own ethnic groups, the pace of minority hiring will not
provide the desired numbers. Moreover, the presumption that
role models must be of the same race or ethnicity as the
students that they seek to guide is at least questionable.
Such an assertion leaves white faculty members in a nether
region in which their motives and abilities as mentors
appear devalued. All students, I believe, would be better
served if our predominantly white faculty felt more comfor-
table and better prepared as mentors and role models for our
minority students.

To this end, we have in place a large and growing minority
student retention program, within which over 90 of our
faculty, administrators, and professional staff are gaining
experience as mentors. Our current focus is on the further
refinement of mentor training and on promoting cross-
cultural awareness on the part of all our employees.

A second imperative for accommodating cultural diversity on
our campus involves expanding the curriculum to encompass
the values and contributions of other cultures. As you all
know, a national debate is raging over whether the ideas and
works of western civilization, with their male eurocentric
focus, should remain the cornerstone of the curriculum. But
there are many in our colleges for whom this is an alien
cultural perspective, and even some who see western civili-
zation as an oxymoron. Gandhi, for example, when asked what
he thought of western civilization, is supposed to have
replied that western civilization might be worth a try.

We believe that our aim, as institutions of higher educa-
tion, should be to celebrate cultural diversity, both in
our attitudes and in our curricular perspectives. As a
consequence, we are currently seeking funds - through grants

and other sources - to develop a summer scholarly institute
for faculty, much along with lines of our previous NEH
summer institute in greek mythology, that would focus on the
study of african-american art, literature, history, and
culture, as a means to stimulate curricular enrichment.

Expanding the curriculum does more than provide new works
for old syllabi. Expanding the curriculum creates a common
ground for faculty and students. By recognizing the richness
of other cultures, we foster both an interest in and support
for cultural diversity. For minority students, it demon-
strates the faculty's recognition and appreciation of their
culture. For our traditional white majority, it presents a
much-needed perspective on our changing society and forms
the basis for appreciating rather than resenting diversity.

Dennis S. Bartow
Vice President for Instruction
Prince George's Community College
301 Largo Road
Largo, MD 20772-2199

John Bauman

The Curriculum Manager

The Curriculum Manager (TCM) is a software program which has assisted me in developing, organizing, and updating my principles of economics course materials for the past four years. The program is menu driven, easy to use and accessible through a PC or via the mainframe.

I would like to discuss the kinds of course materials I have developed with TCM and elaborate on the strengths and weaknesses of using this software package to develop these materials.

Computer developed materials in my principles of micro and macro economics courses consist of five main components.

1.   Unit Objectives (Learning Outcomes)

Approximately 120 objectives (learning outcomes) divided into 13 units have been inputted and numbered. The objectives form the basis of the program (and the course) as they are correlated to all other components. Please refer to an example of a learning outcome tied to instructor's notes and a resource reference in Appendix A.

2.   Instructor's Notes

Instructor's notes are comparable to lecture notes to describe each objective. Concepts, formulas, theories, etc. are explained in the instructor's words using the most recent available data and examples, as well as language, which I believe is much less confusing than textbook content. Most students in my courses do not purchase a textbook, but instead rely on the instructor's notes and current event readings from newspapers, journals and books.

3.   Resource References

Resource references are references to, for instance, textbook pages (some students still like to refer to a textbook as a back-up source), journal and newspaper articles, video programs, and practice problems which relate directly to the objectives.

4.   Exam Questions

Each of the 120 objectives has been correlated with an average of three multiple choice exam questions. Once the exam questions have been inputted (they can be downloaded from WordPerfect), the program allows me to randomly generate

tests and come up with a new exam each semester. I have entered only multiple choice items (see Appendix B). The software does accept essay questions, but does not automatically grade and provide answer diagnostics for them. Essay questions, which make up 20% of my exams, are processed through WordPerfect.

5. Exam Answer Diagnostics

After a student completes an exam, I take his/her OpScan sheet to the computer center for processing. The student then receives complete test results, including answer diagnostics. Answer diagnostics are computer generated comments about the student's answer for each multiple choice question. Correct answers are accompanied by a word of praise (especially if it was a challenging question); incorrect answer diagnostics tell the student what the correct answer is and why the answer s(he) picked is incorrect (appendix C).

Test results also include information on exactly which objectives s(he) did and did not master. This tells the student which objectives to review for complete mastery of the objectives. This feedback will help a student study for comprehensive final exams. I use practice exams in my course in which case a student can use the feedback to study for the real exam. I have also found the feedback helpful for my telecourse students. The diagnostic exam report allows students to independently analyze the exam results, which saves already limited class time.

Strengths and Weaknesses of CMI

The main drawback to the use of CMI has been the tremendous amount of time I have spent entering the various components. Particularly, the answer diagnostics take much time. Three hundred exam questions contain approximately 1350 answer choices. Each answer choice requires an explanation.

Furthermore, because all components are correlated, revising one element usually requires changing all related components. For instance, I have found it very dangerous (i.e., time consuming) to delete and subsequently re-number certain objectives as it required re-entering related resources, notes, exam questions and diagnostics.

Content within elements can be easily revised, though. I frequently add to and update my instructor's notes to include the latest statistics, trends, and examples (the elasticity of demands for teenage mutant ninja turtle dolls or MC Hammer CD's).

The package also saves me class and preparation time and part-time instructors in my area are currently using the handouts for their students and their own use as well. Students greatly appreciate the handouts and reports because of their organization, clarity and individualized content.

Last, but certainly not least in these recessionary times, students are happy about not having to purchase $30-$50 worth of economics textbooks and study guides each semester.

John Bouman is Associate Professor of Economics at Howard Community College, Little Patuxent Parkway, Columbia, MD 21044

For more information on how to obtain the computer software described in this paper, please contact:

> ABACUS Data Group
> 921 S.W. Washington Street
> Suite 410
> Portland, OR 97205

1   As opposed to a firm in perfect competition, a
     monopolist is able to make profits in the long run.
     Because of barriers to entry the monopolist can
     continue to make profits without fearing that other
     firms will easily enter the market and eat away the
     profits. Realistically though the monopolist cannot
     charge too high of a price because there will come a
     point where some people find enough motivation to
     enter the market if profits in the market are high
     enough.

1908   List and describe economic disadvantages of monopolies

1   A monopoly is never socially desirable, except in a
     case where because of economies of scale (the firm is
     so large that it can produce efficiently and cut costs
     per product) it sells its product cheaper than firms in
     perfect competition would have. In all other cases a
     monopolist will tend to charge a higher price and
     produce less of a product than firms in perfect
     competition. This, obviously is not
     socially desirable as it hurts consumers. Other
     arguments against monopolies and big businesses are:
     *monopoly profits benefit a few already rich monopoly
     owners
     *monopolists are less efficient than smaller, more
     competitive firms as they have no incentive to innovate
     and keep costs down.

2   Lesson 19, case study 1: "Monopoly: Who's
     In Control?"
     Standard Oil was broken up by the U.S. gov't in the late
     1800's because its existence was not considered socially
     desirable. It produced less than what it could be
     producing and charged too high of a price.

1909   List and describe a possible advantage of monopolies

1   Economists Schumpeter and Galbraith have argued that
     monopolies are in a better situation than small

Sub Curriculum: EC-102   PRIN. OF ECONOMICS MICRO
Objective: EC-102 -1908 List and describe economic disadvantages of monopolie

Item No	Time	Item Type	Dif Lev	Per Pg.	No. Resp	Add Date	Change Date	--Revision-- No	--Revision-- Date	In Use	MQ Head
01	0:30	MC	5		4	07/10/89	07/27/89	/	/0	1	
Test Responses:			A - 19		B - 17	C*- 187	D - 10	E -			

Question Text
If a competitive industry were instantly monopolized such that costs were not affected, what would happen to the equilibrium price and quantity of the product?

    a. Price and quantity would remain the same.
    b. Price would fall; quantity would rise.
    c. Price would rise; quantity would fall.
    d. Price would rise; quantity would rise.

Resp/Code		Answer/Diagnostic Text
A	9	The correct answer is c.
B	9	The correct answer is c. It's the other way around.
C	0	AND YOUR SCORE SHOULD RISE AS A RESULT OF PICKING THIS ANSWER!
D	6	The correct answer is c.

Item No	Time	Item Type	Dif Lev	Per Pg.	No. Resp	Add Date	Change Date	--Revision-- No	--Revision-- Date	In Use	MQ Head
02	0:30	MC	5		0	07/10/89	07/25/89	/	/0	0	013
Test Responses:			-		-	-		-			-

Question Text
Critics of monopoly firms have stated several disadvantages of

Appendix C - Answer Diagnostics

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        Student Response
Qust ! Correct Answer
No.  ! ! Objective              Comments/Diagnostics
------------------------------------------------------------------------
 1. D * EC102 1911 YOU'VE CAPTURED ANOTHER TWO POINTS!
 2. D * EC102 2006 WELL ANSWERED!
 3. D * EC102 1806 CORRECT!
 4. C * EC102 1807 WELL DONE!
 5. A * EC102 2009 YOU'RE RIGHT!
 6. B * EC102 1811 YES! May you receive excess economic scores!
 7. E * EC102 1801 WELL ANSWERED!
 8. C * EC102 1908 YES!
 9. A * EC102 1907 CORRECT!
10. C * EC102 2007 YOU DISTUINGISHED CORRECTLY!
11. B * EC102 2005 WELL DONE!
12. A 3 EC102 2007 This is true, but so are b and c, so choose answer d.
13. B * EC102 1906 YES!
14. B * EC102 2006 CORRECT!
15. A * EC102 1812 CORRECT!
16. C * EC102 2010 WELL ANSWERED! (Without collusion, I hope?)
17. A * EC102 1909 PRECISELY!
18. D * EC102 2008 YES! The cost curves are shaped the same in all industries.
19. B * EC102 1803 GOOD!
20. D * EC102 1809 WELL ANSWERED!
21. E 6 EC102 1910 The only correct answer is b.
22. A * EC102 1904 RIGHT!
23. D * EC102 2001 PERFECT!
24. A * EC102 2004 DIDN'T YOU WISH THEY WERE ALL THIS EASY!
25. C * EC102 1810 CORRECT!
26. C * EC102 1801 CORRECT! (you mean you've never heard of ecolopoly???)
27. D * EC102 1907 GOOD!
28. B * EC102 1804 RIGHT! This does not represent the MC curve.
29. E * EC102 1801 YOU GUESSED IT! (I mean, correctly identified it!)
30. B * EC102 1808 ADD TWO POINTS!
31. D * EC102 1809 YOU'RE RIGHT!
32. C * EC102 1805 YES!
33. D * EC102 1805 WELL DONE!
34. E 9 EC102 1805 The answer is a. You don't close down because P ($27) exceed
                   VC.
35. D * EC102 1905 WELL CALCULATED!
36. C * EC102 1905 CORRECT ANSWER!
37. C * EC102 1905 CORRECT!
38. B 9 EC102 1908 The correct answer is c. It's the other way around.
39. E * EC102 2006 OKAY!
40. A * EC102 1906 WELL VISUALIZED!

        Correct:  36    Incorrect:  4    % Correct:  90.0
```

```
              OBJECTIVES  MASTERED THIS TEST
OBJECTVE REQ. CORR  DESCRIPTION
EC102 1911   1    1  Understand the Capture theory of regulation
EC102 2006   3    3  Recognize in a graph a monopolistically competitive firm
EC102 1806   1    1  Determine from a graph--purely competitive firm's profit
EC102 1807   1    1  Identify a competitive firm's profit area from short run
EC102 2009   1    1  Define collusion and understand its consequences
EC102 1811   1    1  Understand price & output determination for competitive
EC102 1801   2    3  List and describe characteristics of the four market
```

Student: 220964027   BRIAN   Test ID
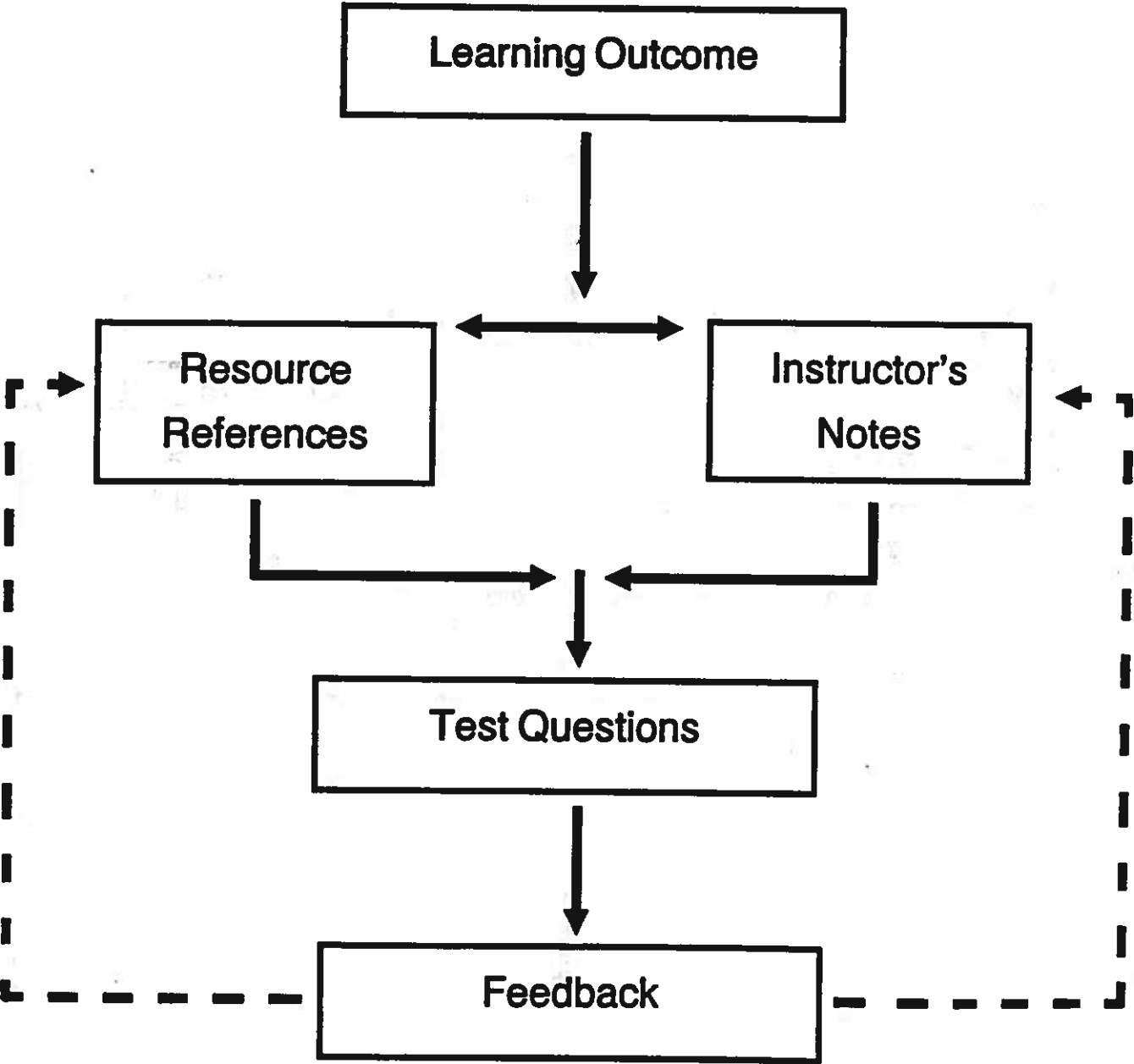Teacher: STAFF STAFF   T0000076

```
        Student Response
Qust I Correct Answer
No.  I I Objective              Comments/Diagnostics
-----------------------------------------------------------------------------
EC102 1907    2    2   Understand long run output determination
EC102 2005    1    1   Know how firms in monopolistic competition determine
EC102 1906    2    2   Determine from a graph the profit maximizing production
EC102 1812    1    1   Understand the effects of price ceilings & price floors
EC102 2010    1    1   Describe three barriers to collusion
EC102 1909    1    1   List and describe a possible advantage of monopolies
EC102 2008    1    1   Compare oligopoly with perfect competition
EC102 1803    1    1   Know how to calculate a firm's total revenue (TR)
EC102 1809    2    2   Know when a firm should decide to close down
EC102 1904    1    1   Draw corresponding marginal revenue and average revenue
EC102 2001    1    1   Define monopolistic competition and know characteristics
EC102 2004    1    1   Provide at least two examples of oligopoly industries
EC102 1810    1    1   Derive a purely competitive firm's short run supply
EC102 1804    1    1   Draw the marginal revenue and average revenue curves
EC102 1808    1    1   State (& repeat in your sleep 63 times) the GOLDEN RULE
EC102 1805    2    2   Determine a purely competitive firm's profit maximizing
EC102 1905    3    3   Determine from a table with a monopolist's cost
-----------------------------------------------------------------------------
```

```
              OBJECTIVES   NOT MASTERED THIS TEST
OBJECTVE REQ. CORR  DESCRIPTION
EC102 1908    2    1   List and describe economic disadvantages of monopolies
EC102 2007    2    1   Compare monopolistic competition & perfect competition
EC102 1910    1    0   Know the purpose of regulatory commissions who control
```
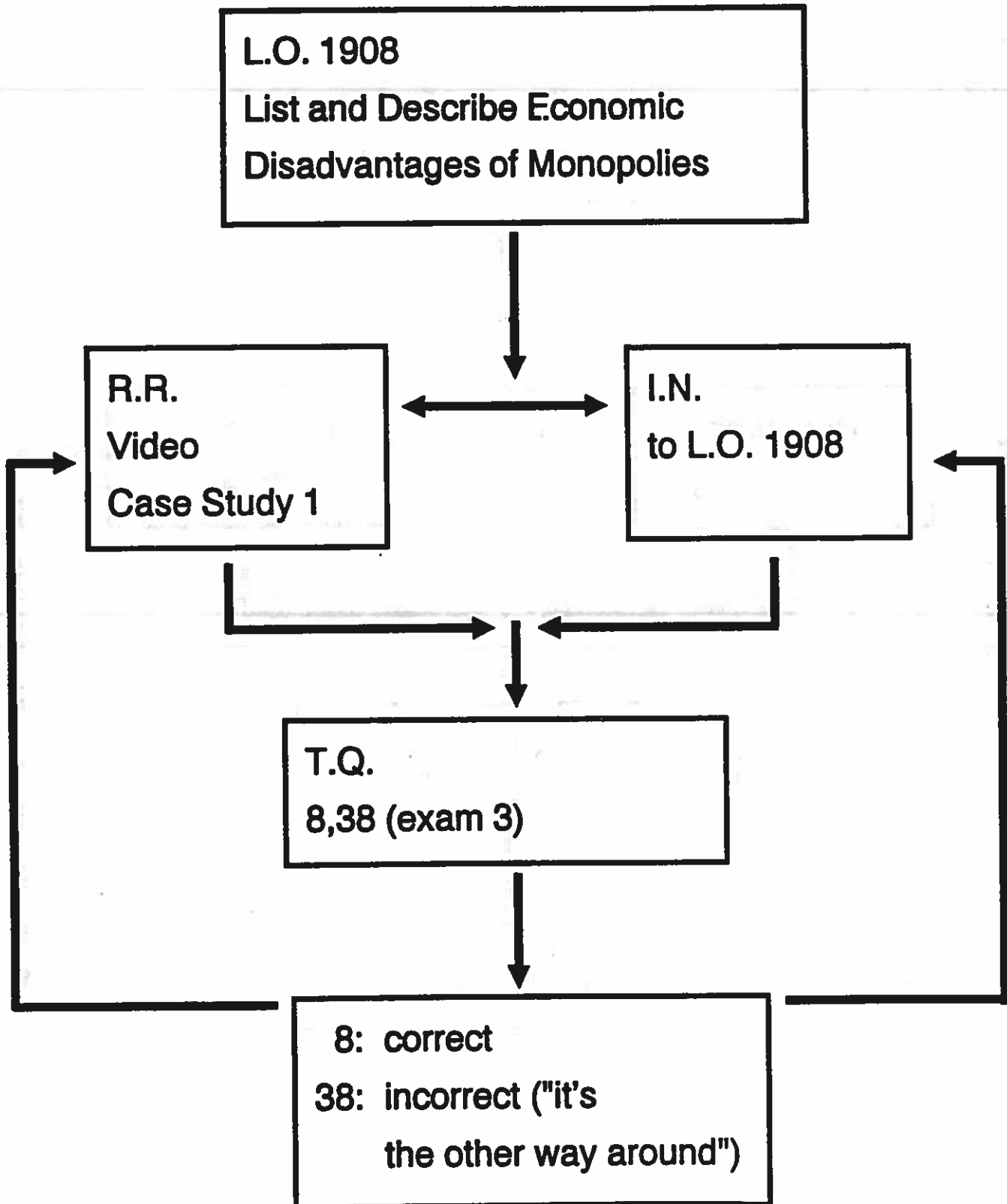
        Mastered: 24 Not Mastered: 3   % Mastered: 88

Study Sequence

```
                    ┌─────────────────────────┐
                    │    Learning Outcome     │
                    └─────────────────────────┘
                                 │
                                 ▼
┌──────────────────┐                    ┌──────────────────┐
│    Resource      │◄──────────────────►│   Instructor's   │
│   References     │                    │      Notes       │
└──────────────────┘                    └──────────────────┘
          │                                      │
          └──────────────►  ◄────────────────────┘
                           │
                           ▼
                ┌─────────────────────┐
                │    Test Questions   │
                └─────────────────────┘
                           │
                           ▼
                ┌─────────────────────┐
                │      Feedback       │
                └─────────────────────┘
```

Study Sequence Example

```
┌─────────────────────────────────┐
│ L.O. 1908                       │
│ List and Describe Economic      │
│ Disadvantages of Monopolies     │
└─────────────────────────────────┘
                 │
                 ▼
┌──────────────┐     ┌──────────────┐
│ R.R.         │◄───►│ I.N.         │
│ Video        │     │ to L.O. 1908 │
│ Case Study 1 │     │              │
└──────────────┘     └──────────────┘
         │                  │
         └────────►◄────────┘
                 │
                 ▼
        ┌──────────────────┐
        │ T.Q.             │
        │ 8,38 (exam 3)    │
        └──────────────────┘
                 │
                 ▼
     ┌───────────────────────────┐
     │  8:  correct              │
     │ 38:  incorrect ("it's     │
     │       the other way around")│
     └───────────────────────────┘
```

SENIOR FITNESS PROGRAM, PREPARING FOR THE XXV OLYMPICS, BARCELONA '92

Mercedes Lesser

Abstract

Research on aging is potentially unlimited in scope, so judgment must favor areas which show scientific promise or which society deems to be important public issues. A major emphasis in research on aging is to understand the aging processes and how aging is distinct from disease, in order to better understand which changes are inevitable and which are open to modification.

In addition, research is finding that many of the so-called signs of "Old Age" can be more accurately identified as the combination of lifestyle and environmental factors for which effective intervention often exists.

This process began at the onset of the 1980's with the publication of the 1990 Health Objectives for the Nation. The subjects that they address and the measurable targets that they pose embody the commitments of many dedicated people working in health and related fields. Many more will be required to put these objectives into practice in the coming decade in order to help mobilize energy and resources, and to make measurable improvements by the year 2000. For this reason the program addressing the fitness needs of older adults at Chesapeake College, which has been implemented in the 1970's, became international in the 1980's, and will become Olympic in the 1990's.

References

United States Department of Health and Human Services. *Promoting Health, Preventing Disease: Year 2000. Objective for the Nation.* Washington: Department of Health and Human Services, September 1984.

United State Department of International Aging. *American Association for International Aging Reports.* Washington: AAIA Publisher of International Aging, 1983-89.

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MENTORING SUPPORT PROGRAM TO FOSTER STUDENT SUCCESS, FACULTY DEVELOPMENT, AND COMMUNITY INVOLVEMENT

John Edwards, Molly Mastroberti, Rosemary Wolfe

Abstract

The Supplemental Instruction with Mentoring Support program at Anne Arundel Community College, sponsored by a grant from the Fund for the Improvement of Postsecondary Education (FIPSE), uses the Supplemental Instruction model to improve students' academic success in difficult college courses, to provide faculty professional development through a faculty mentoring program, and to involve community business leaders as community mentors to disadvantaged students.

Faculty and students participate in training seminars which include instruction in interactive learning strategies and group communication skills. In addition, faculty and students work together to prepare and model techniques for connecting study skills to difficult subject matter in courses such as accounting, biology, chemistry, calculus, statistics, and law.

Evaluation of the program shows an increase in student success in courses as well as in faculty perspectives on student learning.

Description of the Program

The Supplemental Instruction (SI) program with Mentoring support is an academic support system at Anne Arundel Community College which offers an alternative to serving the needs of students in difficult required college courses. The program shifts the focus from high-risk student to the high-risk course and attaches the service directly to the course. Sponsored by a grant from the Fund for the Improvement of Postsecondary Education (FIPSE), this program promotes student success in understanding and questioning the ideas in the course through a collaboration of peer group study, faculty mentoring, and community involvement.

High-risk courses are those in which the subject matter is inherently difficult and presents a challenge even when taught by a skilled teacher to motivated students. Courses in accounting, business law, math, and science are among the courses at the community college that, by nature of their difficult concepts, are often high-risk courses.

Peer group study sessions are led outside of class time by community college students who have already successfully completed the courses. These Supplemental Instruction (SI) leaders are trained through a three-credit education practicum course to teach students how to use interactive learning strategies and study skills to learn the course content. SI leaders attend classes with enrolled students, taking notes, completing assignments, and preparing for tests. In addition, they lead two to three one hour review sessions each week to help students organize and understand the subject.

Student SI Leaders

Community college students working as SI leaders are examples to their fellow students of how successful student achievement can be rewarded. As paid leaders, these students receive intensive training under faculty supervision to learn to incorporate their own successful learning and thinking strategies into discussions of course content. Training includes practice in integrating study skills with content as well as demonstrations applying critical questioning techniques to course concepts. Student leaders also receive academic credit through a practicum course.

Community Involvement

Community support is provided through a series of

snall group discussions led by local civic and business leaders. Community leaders are invited to attend a Supplemental Instruction study session for a course that would be required or applicable to the community leader's field. On the day of the community leader visit, SI leaders conduct an abbreviated study session, giving the community leader the opportunity to observe and participate . Then, the community leader speaks informally to students, discussing career related topics and answering student' questions.

Community leaders' support gives students an opportunity to interact with leaders in their career fields. Students see community leaders as a link to defining and achieving their goals. Community leaders welcome an opportunity to interact with students and to help them focus on local career possibilities. In addition, community leaders reinforce the importance of college course work for career success.

Faculty Mentors

Faculty who are model teachers at the college attend classes and SI sessions with student SI leaders for the first four weeks of the semester. Faculty mentors are assigned to courses outside their own discipline so that a math professor may be attending a law class. The connection of faculty expertise in teaching with student leaders' mastery of the content works together as a learning experience for both.

The faculty mentors work with SI leaders to prepare materials, to plan for SI study sessions, and to evaluate student leaders. As observers in courses outside their own disciplines, faculty mentors have the opportunity to become students again and to observe and interact with colleagues in a nonthreatening and nonevaluative way. In addition, faculty mentors meet together to discuss observations and reflections of teaching strategies and curriculum.

Faculty Mentor: Personal Insights

During the first four weeks of the semester, the faculty mentor attends all classes of a course outside his or her own discipline and has the opportunity to see the instructional process from the fresh perspective of a college freshman again. As a student, the faculty member becomes aware of the myriad of problems and circumstances under which students attend classes at a community college, from students with full credit course loads in addition to working a thirty hour work week to single parents with child care

problems. An empathy develops with students who are having high anxiety about taking tests; in addition, the faculty member can readily observe students who do not know how to organize material and are overwhelmed by the course requirements. Of the many perspectives on student learning the faculty mentor gains, the most important seems to be that students need to be thought of and treated as individuals.

During the first four weeks of the semester, the faculty mentor has the rare opportunity to observe a colleague on a long term and sustained basis. This observation is nonthreatening and unobtrusive. The instructor has allowed a colleague to enter an intimate part of his or her professional life - the classroom - and as a result, the faculty mentor gains a deeper respect and appreciation of another colleagues's discipline and teaching style. The faculty mentor becomes an observer of a colleagues' use of dialogue and motivational techniques, and witnesses how a fellow colleague handles attendance problems, lateness to class, talking in the back of the classroom, missed tests and quizzes, homework, the breakdown of AV equipment, shy students, and students who try to dominate the class, in addition to new teaching techniques and approaches which can be adapted to the observer's discipline. A professional bonding takes place between the faculty mentor and the instructor.

As a faculty mentor, bonding occurs yet on another level. As a collaborator with fellow faculty mentors, faculty meet to explore and discuss ideas which have come out of the mentoring experience. Through the sharing of information recorded in journals and the commonality of the mentoring experience, a rapport among colleagues is stimulated and professional expertise is broadened.

Summary

The SI program with Mentoring Support provides an approach that promotes valuable academic support to students as well as professional development for faculty. Students see the program as a practical way to study and understand course content; instructors encourage students to use SI as a service which supplements course content with critical thinking; faculty mentors experience a broadening of professional expertise and new perspectives on student learning as a result of their participation; community leaders welcome the opportunity to interact with faculty and students at the college. Together, all are partners for success.

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L.I.F.E. LITERACY IS FOR EVERYONE: BASIC READING FOR ADULTS

Ken Bourn

Abstract

The Bourn Sound Method avoids casting students immediately
into the inconsistencies and illogic of standard "social" reading
and writing. The method, based on the sounds in spoken English,
is consistent and logical, allowing students to proceed with
greater confidence. From an understanding of "sound" reading and
spelling, students are taught to process social writing.

Through a series of eight half-hour videotaped lessons,
adults learn to read and spell. The lessons teach students
through four basic steps. First, students are taught to represent
each of the 35 separate sounds in spoken English with a single
"sound symbol." Then, using these consistent sound symbols,
students are taught to read and spell in "sound writing." In the
third step, nine unvarying steps of attack are used to teach
students to read social writing by converting into sound writing.
In the final step, students are taught to spell in social writing
by using the "multiplication table of spelling."

Students are guided thrugh essential home practice with the
assistance of materials provided on request. A "home helper" (a
family member or good friend) accompanies the student through the
learning process by watching the videotaped lessons, assisting
with daly home practice and providing encouragement. Help is also
available by phone to both students and home helpers.

"Literacy is for Everyone (L.I.F.E.): Basic Reading for
Adults" is a copyright production of Kenneth R. Bourn. The
L.I.F.E. series on videotapes is ideal for reaching adult
illiterates in our communities through presentation in libraries,
community centers, churches, adult education classes, social
service agencies and community service television channels. In
most of these situations, tapes might well be available on loan
for home viewing.

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Maryland 21237. Telephone: (301) 522-1268.

INDEX