Multifaceted Active Learning Approach to Teaching Pharmacy Health Care and Behavior

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The goal of the multifaceted teaching innovation was to actively involve students in their learning, facilitating attitudinal changes as well as behavioral changes. Students learnt by assuming diverse roles during the semester. As instructors, students were responsible for teaching a class topic. As health educators, students went into the community to teach and encourage health promotion and disease prevention. As presenters, students presented their community projects to faculty and other students. As researchers, students explored patients’ expectations and how pharmacists can meet these expectations. As potential role models, students assessed their unhealthy behaviors and chose to stop one of the unhealthy behavior by the end of the semester. As authors, students worked on several papers, including a report of their research investigation. Evaluative data from the innovation confirm that the learning objectives for the class were achieved with the multifaceted learning approach.

INTRODUCTION

The “Pharmacy and Health Care Behavior” course is a Pharmacy Administration core course in the PharmD Curriculum at Florida A&M University. This course introduces professional pharmacy students to social and behavioral fundamentals of health care and pharmacy practice. Teaching the class via traditional classroom teaching method proved to be ineffective. Students often were bored with regular classroom instructions and did not participate in the instructor-initiated discussions. There was no enthusiasm among students nor active participation in the classroom. This often led to an unfriendly teaching environment, with the instructor trying hard to engage the students as well as ensure that learning objectives are achieved. In addition, the paper and pencil method of evaluating students’ knowledge of course content was frustrating as students only memorized the content for test or exam purposes. Students’ lack of understanding of the materials often came across, with generally poor performance on tests and exams.

After three years of teaching the course, it was clear that the learning objectives for the “Pharmacy and Health Care Behavior” course were not being achieved using the traditional classroom teaching style. Students sit in class and listen (or pretend to listen) to the lectures but do not show good understanding of the materials on tests or exams. More importantly, there was no way to validate students’ mastery of the learning objectives.

The limitation of the traditional teaching method (as experienced in the “Pharmacy and Health Care Behavior” course) is well documented in the literature. As pointed out by Brandt(1) in a recent analysis, traditional lecture method limits students’ attention span and retention rates. To overcome this limitation, active learning has been proposed as an educational philosophy to engage and involve students in their learning experience for better educational outcomes. This educational philosophy is part of a more comprehensive multifaceted educational framework proposed for pharmacy education(2). Based on this multifaceted educational framework, a decision was made to implement diverse learning strategies and unique assessment tools to evaluate student knowledge and skills in the “Pharmacy and Health Care Behavior” course beginning fall of 1999.

OBJECTIVES AND GOALS OF THE INNOVATION

The goal of the multifaceted learning approach was to actively engage students in their learning process to be able to achieve the professional practice based outcomes for the course. The innovative learning strategies were implemented to allow students to gain new knowledge of concepts and facts; utilize the literature; exercise and strengthen writing and oral communication skills; engage in critical and creative thinking; engage in health care activities and behavior; constantly assess their professional behavior and that of their peers; advance their skills in life-long learning; and (as pharmacists) thereby be able to provide pharmaceutical care services to meet the need of patients. The innovation was based on students learning by thinking and doing. In the course, students were instructors, health educators, presenters, researchers, role models, authors and in sum respected professionals. This enabled students to exhibit the behavioral outcomes for the learning objectives specified for the class (see Appendix A for a description of the course objectives).

DESCRIPTION OF THE INNOVATION

The Pharmacy Health Care and Behavior course is offered in the second professional year of the Doctor of Pharmacy cur-
Table I. Topics taught by students

| Access; Arthritis, Osteoporosis, and Chronic Back conditions; Cancer |
| Chronic Kidney Disease; Diabetes; Disability and Secondary Conditions |
| Educational and Community-Based Programs; Environmental Health; Family Planning |
| Food Safety; Health Communication; Heart Disease and Stroke; HIV; Immunization and Infectious Diseases; Injury and Violence Prevention |
| Maternal, Infant, and Child Health; Medical Product Safety; Mental Health and Mental Disorders |
| Nutrition and Overweight; Occupational Safety and Health; Oral Health |
| Physical Activity and Fitness; Public Health Infrastructure; Respiratory Diseases |
| Sexually Transmitted Diseases; Substance Abuse; Tobacco Use; Vision and Hearing |
| Definitions and Meaning of Health |
| Illness, Sickness, and Disease |
| The Meaning of Signs and Symptoms |
| Acute vs. Chronic Problems |
| Images of Pharmacists and Pharmacies |
| Other Health Care Providers and the Pharmacist |
| Unorthodox Healing Systems |
| Pharmacists’ Performance in Drug Product Selection and Therapeutic Interchange |
| Sexually Transmitted Diseases; Substance Abuse; Tobacco Use; Vision and Hearing |
| Definitions and Meaning of Health |
| Illness, Sickness, and Disease |
| The Meaning of Signs and Symptoms |
| Acute vs. Chronic Problems |
| Images of Pharmacists and Pharmacies |
| Other Health Care Providers and the Pharmacist |
| Unorthodox Healing Systems |
| Pharmacists’ Performance in Drug Product Selection and Therapeutic Interchange |
| Interprofessional Relations in Drug Therapy Decisions |
| Consumer Behavior Regarding the Choice of Prescription and Nonprescription Medications |
| Determinants of Medication Use |
| Predicting and Detecting Noncompliance |
| Explaining and Changing Noncompliant Behavior |
| Children and Medicines |
| Adolescents and College students |
| Ambulatory Elderly |
| Long-term Pharmaceutical Care: Social and Professional Implications |
| Hospitalized Patients |
| Pharmaceutical Care of Terminally Ill Patients |
| Mental disorders |
| Cultural Issues in the Practice of Pharmacy |
| A Macro View: Public Policy |
| The “Rebirth” of Cognitive Services |
| Recent Developments in Behavioral Medicine |
| Expectations, Education and Technology |
| Ethical Concerns in Drug Research |

riculum. At this time, the students would have taken two semesters of professional communications, which has developed their skills in communicating with patients, caregivers and professional colleagues. The course introduced the students to social and behavioral fundamentals of health care and pharmacy practice. A total of 117 students were enrolled in the class in the fall of 2000. Due to the high number of students, the class was divided into two sections with 67 students in Section 1 and 50 students in Section 2. Majority of the students (over 90 percent) were African-Americans.

Instructional and Assessment Materials

The course content covered several health care and behavior fundamentals in nine lecture sections summarized in Appendix B. The course materials were based mostly on current published literature and the following texts:

4. Managed Care Lecture packet developed by Folakemi T. Odedina, PhD.

Case studies were employed to ensure students’ understanding of course materials. An example is the economic evaluation case studies reproduced in Appendix C. Students’ assessments in the class were based more on actual behavioral performance and less on traditional paper and pencil testing. The different methods employed for student assessment are summarized in Appendix D.

Course Process

The Pharmacy Health Care and Behavior Course is a 4-credit hour semester course. It is conducted weekly as a (i) two-hour lecture taught by Dr. Odedina, and (ii) two-hour lab led by Ms. Nikita Dukes (Section 1) and Ms. Carla Clemmens (Section 2). The process employed in the course include formal lecture, small group laboratory for recitations, discussion sessions, poster presentations by students, written reports, and debates of issues. Faculty and lab instructors facilitated student learning by engaging and challenging them and by participating in and leading discussions. Students learned by listening, teaching, reading, writing, speaking and defending their ideas, critiquing the presentations of others, and by being critiqued by peers and faculty.

The Teaching Innovation

The teaching innovation was a multi-faceted process that engaged students in active learning through teaching, manuscript writing, field research, community health promotion and education, healthy behavior, and professional presentation. The notion was to have students learn by performing the expected learning objectives. Seven educational processes were employed for the innovation.

1. Student Presentation: The overall goal of this educational process was to place students in the role of instructors, which is the best method to learn. Students were required to teach a class topic during recitation using PowerPoint presentation or a standard audiovisual such as overhead projector. The students were responsible for providing lecture handouts summarizing their lecture to other students. In addition, the students were provided the opportunity to submit 10 questions from their lecture, which goes into the
exam and made this process uniquely different from their presentations in other classes. Students' lectures were graded by the lab instructors based on their professionalism, organization, content clarity, response to questions and quality of reference materials. The topics taught by students in the class are presented in Table I.

2. **Manuscript Writing:** The specific aim for the manuscript writing requirement was to encourage students to think critically and express their opinions in a logical, persuasive and organized way. Students worked on a term paper focusing on the Healthy People 2010 objectives, wrote a report on their “field research” (described below) and some students elected to work on a manuscript submission to a peer-reviewed journal. Students’ papers were graded by instructors with specific feedback to improve the papers.

3. **Community Health Promotion and Education:** The students were able to use the knowledge and skills acquired from the class to empower the community through this project. After a series of lectures by the professor on community needs assessment, strategy to prevent disease, strategy to detect disease, evaluation of health promotion and disease prevention activities, the students went into the community to educate and promote healthy behavior. In groups of five, students conducted a health promotion or disease prevention activity at an approved site for at least four consecutive weeks. Students’ community projects were graded at community sites by their lab instructors. Students were also asked to provide a self-analysis of their community projects. Examples of the community activities provided by students were:

- Teenage Pregnancy at McGuinn Dormitory (girls)
- Sexually Transmitted Diseases at FAMU Foote Hilyer Administration Building
- Child Safety at New Beginnings Day Care Center, FAMU
- Diabetes at the local YMCA
- Immunization at Leon County Public Library
- Osteoporosis at Heritage Health Care Center
- Voting at FAMU Bookstore
- Drinking and driving at Tallahassee Community College
- Hypertension at Hair and Nail Salon
- Skin Cancer at the local YMCA

4. **Poster Presentation:** Students were provided the opportunity to present their community projects to faculty and other students on campus by displaying a poster presentation of their project. The poster display included a description of their project, evidence of the project success (from interviews with target audience) and students’ reflections about their community project. Poster presentations were set up for a minimum of three hours. The posters were evaluated by three independent judges based on relevance of the health topic, significance to target audience, relevance of community site, quality of materials and information, feedback from community participants, and students’ ability in responding to judges’ questions.

5. **Field Research:** Another innovative educational process employed in the class was field research by the students to explore patient needs and extent to which pharmacists meet these needs. Section 7 of the course content (see Appendix B) focused on special classes of patients. After a series of lectures on patients in long-term care and chronically ill patients, students were asked to conduct a qualitative study to compare and contrast the services pharmacists provide with those the patient/caregiver wants. The field study required patient/caregiver and pharmacist interviews.

This experience provided students with the opportunity to directly communicate with patients/caregivers, gain insight about patient expectations of pharmacy services, objectively assess whether the needs are being met and more importantly think about their role as a practitioner in the healthcare system. Student papers were graded by instructors.

6. **Self Health Promotion:** One of the key points emphasized in the class by the professor was pharmacists serving as role models for their patients, especially in health promotion. As future practitioners, it is important that students are aware of and promote healthy behavior. The importance of pharmacists’ credibility was emphasized - for example it will be hard for a pharmacist to ask a patient to stop smoking if the pharmacist smokes. After the series of lectures on Healthy People 2010, students were asked to list the top three unhealthy behaviors they have. From these three behaviors, students were told to choose one unhealthy behavior that they would stop by the end of the semester. The unhealthy behavior was written on a piece of paper with a unique identifier that can only be identified by the student before submitting to the professor.

Students were constantly reminded in class to keep their promise and stop the unhealthy behavior. At the end of the semester, students were asked to pick up their healthy behavior promissory note, reflect on their healthy behavior in the last four months and encouraged to keep their promise of ending the unhealthy behavior.

7. **Professional Behavior Assessment:** The profession of pharmacy demands that practitioners adhere to the highest standards of professionalism. In the class, students were expected to be at their best professional behavior constantly. To ensure this, students monitored their professional behavior monthly using Hammer’s “Professional Behavior Assessment Form.” Their assessments were submitted to lab instructors and compared to peer and instructor evaluations of students’ behavior using the same form. Students received feedback on their peer and instructor evaluations to continuously improve their professional behavior.

**EVIDENCE OF STUDENT LEARNING**

The evidence of student learning was assessed by: (i) students’ performance on assigned projects, and (ii) qualitative feedback from students, community project participants, poster presentation judges, and an administrator. The class portfolio2 of students’ manuscripts, presentation transparencies, class hand-
outs, community project resources, community project posters, transcripts of patient interviews, transcripts of pharmacist interviews and field research reports provides an objective evidence of the quality of the students work. Overall, the students’ final grade in the class was outstanding. The average final point earned in the class was 92 percent.

Students’ Feedback

The most rewarding aspect of the innovation was the students’ appreciation of the innovation. Despite the hard work required for the course, students’ feedback was very positive. The students enjoyed all the assigned projects with the community project being the most popular. Excerpts from students’ comments on the course are summarized below:

• “This class is advantageous to any student matriculating through pharmacy school here at FAMU. The presentations, the projects and the teacher contributed a lot to help me carry on as a professional pharmacy student.”
• “At the beginning of the semester I thought that it (the community project) was going to be a waste of time and I did not understand the purpose of the assignment. But as my group started to get involved, thinking about our topic, and looking for a good place to present, I found myself becoming a perfectionist because I wanted to make sure my group did the best job.”
• “This class integrated many key concepts that developing professionals, like myself, may find valuable in becoming successful health care providers. You taught us several philosophies concerning other people and their health, and then gave us the opportunity to express our knowledge via a community education assignment.”
• “The impact that our community project had was very obvious. It was great to be able to educate these teenagers and to help them be safe. But the ultimate satisfaction was when these students would inquire When are you coming back? It felt good to know that I had possibly helped someone else along the way; it made us all feel like role models.”
• “As you and I both know that this is only one example of how your efforts in this class served our community and also us. I would like to take this opportunity to thank you for a job well done and pray that you may continue to show your love for us and others throughout the rest of your teaching career.”

Community Project Participants’ Feedback

The students’ community presentations were well received in the community. Students were very excited about the feedback from their sites. For example, a group of students who presented “Preventing Skin Cancer” at a gym were asked by a community participant to present at an annual memorial walk for his brother who died of skin cancer. Formal requests were made by the student center personnel at Florida A&M University and Tallahassee Community College to extend the “Sexually Transmitted Diseases” presentations beyond the normal four week requirement. The “Alcohol and Driving” presentation at a high school was so visual that it attracted record numbers of high school students. The “Day Rape Drug” presentation was very well presented and got the most feedback from participants. Excerpts of feedback received during this community presentation are:

• “This is a very serious situation and everyone should know about it.”
• “The presenters knew the facts and brought up important information about the drug.”
• “The information presented was educational. It was presented nicely.”
• “Helped me become more interested in learning about the date rape drug.”

Feedback from Poster Presentation Judges

The College of Pharmacy and Pharmaceutical Sciences faculty, alumni and graduate students evaluated students’ poster presentations of their community project. Feedback from the poster judges was highly complementary. Some of the comments received include:

• “The posters were outstanding. Each group used their own style to convey important information; targeting the population environment they had been assigned to focus on.”
• “As an alumnus from Florida A&M University College of Pharmacy, I felt pride in observing the students ability to not only define, but to use problem-solving skills for these disease states and health problems.”
• “I felt that their ability to go into the Tallahassee community to face real-life health epidemics was both a rewarding and challenging assignment.”
• “The most outstanding thought I carry is the pride of accomplishment I saw in each group member and how well deserved it was.”

Administrator Feedback

The Dean of the FAMU College of Pharmacy and Pharmaceutical Sciences attended the poster presentations of the community projects every year. He reviews each poster presentation and talks to the students about their community projects. Feedback from the Dean can be summarized in his comments about the students - “They were truly happy about the work that they had done. You could hear it in their voices, see it in their faces, and definitely witness it in the results that they displayed with their community projects. Many students were asked to come back to their project sites to continue to talk to people about their project.”

CONCLUSIONS AND FUTURE DIRECTIONS

The aim of the “Health Care and Behavior” course is to introduce students to the health care system and teach them how to provide comprehensive pharmaceutical care services in a dynamic health care environment. At the end of the course, students must be able to perform the expected learning objectives, display expected attitudes and be able to carry out behavioral expectations. The multi-faceted nature of the teaching innovation implemented in this course makes it unique. Several approaches were employed to ensure attitudinal changes as well as behavioral changes while engaging students’ interests. Answering the question, “What makes the approach innovative in pharmaceutical education?” it would be because students displayed the outcomes expected of a competent practitioner. The students were instructors, health educators, presenters, researchers, role models, and authors.

As instructors, students taught subject materials to other students in class. Using appropriate audiovisuals, students presented class materials, answered other students’ questions, and even developed exam questions from their materials. The stu-
students’ performances in the class exceeded the instructors’ expectations. Apart from doing a fantastic job of teaching the class, they actively engaged their audience using humor, personal examples, and real life cases.

Without any doubt, the most successful performance of the students in the course was as health educators. Students went into the community to teach and encourage health promotion and disease prevention. Armed with materials from excellent sources such as the American Heart Association, Centers for Disease Control and Prevention, and the State Health Departments, the students spent weeks at their chosen sites to educate the community. The lectures on Healthy People 2010, health promotion and disease prevention prepared the students for their community project. The students were very excited about making a difference in the health disparities experienced by minorities. They went out into the community to make a difference and most of them came back changed, realizing the significance of their role as a practitioner in the community.

As presenters, the students had the opportunity to discuss their community projects with faculty and other students. The poster presentation was very successful. The students’ pride in discussing their projects came across very clearly. They were professionals, discussing the impact they had on their community. They talked about how important it was to have made a difference in people’s life by empowering them to take charge of their health.

As researchers, the students investigated the services chronically-ill or long-term care patients get from their pharmacists, the services they actually need, and the services provided by pharmacists. From the perspective of an investigator, they were able to explore patient expectations that were not being met and what pharmacists can do to meet patients’ needs. The research gave the students the experience to seek, obtain and interpret primary data for the purpose of improving their services.

Students were also made aware of their position as role models to patients. They assessed their unhealthy behaviors and chose to stop one by the end of the semester. It was exciting to see the students discuss the potential impact of their health actions (or no actions) on patient consultation. As authors, the students wrote a conceptual paper on one of the Healthy People 2010 objective and also reported the results of their research investigation.

Lessons Learned: Success and Nonsuccess.

The course instructors’ personal reflections on the teaching innovation are provided in Appendix E. As mentioned above, the most successful aspect of the class was the community project and poster presentations of the community project. Students’ prides in their accomplishments were truly the most rewarding part.

The students’ classroom teaching was also very successful. They were very innovative in presenting their materials and extremely knowledgeable on the topics presented. There was a lot of interest in monitoring their health behavior and several of them focused on stopping smoking, eating healthy, exercising, losing weight and practicing safe sex. For their research, the student did an excellent job interviewing patients/caregivers and pharmacists.

Overall, the innovative approaches were very successful. However, there were few students who complained that they had too much to do for the class, especially considering all the outside class activities they had to conduct.

Modifications and Rationale for Modifications

Two modifications are proposed for the class later this year. First, the students had commented that the workload for the class was high given the outside class commitments. A way to address students’ concern is to give them credit, especially for their community project. The students are expected to provide volunteer services in the community as part of their requirements for graduation. From their community projects, students can earn the number of hours they spend in the community towards this requirement. Permission has been obtained from the Volunteer Services office to allow students to fulfill their volunteer hours through their community projects.

The second modification is to formalize the self-health promotion process. Currently, only the students monitor their progress towards their goal of stopping an unhealthy behavior. In addition, there was no method of confirming if the unhealthy behavior was indeed stopped at the end of the semester. To rectify this, students will be asked to choose a classmate they are comfortable with to motivate and monitor their progress towards the healthy behavior for the rest of the semester. Formal feedback on each student’s healthy behavior will be obtained from the students and the respective classmate using a questionnaire. This modification will strongly motivate students to change their unhealthy behavior and also provide feedback on their success.

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References


APPENDIX A. COURSE OBJECTIVES FOR PHA 4724, PHARMACY AND HEALTH CARE BEHAVIOR (2000)

The professional practice outcomes for the “Pharmacy and Health Care Behavior” course is based on the American Association of Colleges of Pharmacy CAPE educational outcomes for the PharmD Curriculum. At the end of the course, a successful student will be able to:

1. Integrate basic knowledge as needed to design, implement, and evaluate patient-specific pharmacotherapeutic regimens to prevent or resolve medication-related problems or to respond to information requests.
   - Relate psychosocial aspects of illness and health to the management of therapy-related problems.
   - Apply preventive strategies and epidemiological research to manage public health problems.
   - Relate the major components of the American health care system and their relationship to the delivery of pharmaceutical care.
2. Apply principles of outcome research and quality assessment methods to the evaluation of pharmaceutical care.
   - Apply principles of pharmacoconomics in making pharmaceutical care decisions.
   - Apply principles of humanistic outcomes in determining impact of pharmaceutical care services on patient’s quality of life.
3. Promote public awareness of health and disease by providing disease prevention/detection programs to the public.
   - Assess the needs of the target population relative to disease prevention/detection.
   - Select and implement an appropriate strategy to prevent (e.g., immunizations) or detect (e.g., blood cholesterol screening) disease in the target population.
   - Provide recommendations for follow-up and/or refer patients for further medical evaluation.
   - Evaluate the impact of the program on the target population.
4. Discuss the priorities targeted for health care improvement in the nation’s Healthy People 2010 Objectives.
5. Define and explain the different types of managed care organizations and their impact on the health care system.
6. Discuss the relationship of pharmacy to the medical care system and processes.
7. Select the most important components of health and illness and how the pharmacist relates to patient behavior.
8. State determinants of medication use and the problems of compliance and non-compliance.
9. Explain the factors leading to drug use, drug choice, and name the most commonly abused drugs.
10. Explain factors determining patients’ choice of care.
11. State the components that differentiate a profession from a trade.
12. Identify the various types of pharmacy practice based on their methods of drug distribution and information.
13. Match the functions and job analysis of practicing pharmacists based on operational definitions.
14. Relate to special classes of patients.
15. Discuss recent concepts in pharmacy practice.

APPENDIX B. PHA 4724 COURSE CONTENT

Section 1: Achieving a Healthy Nation
   - American Health Care System Overview and Role of Pharmacy
   - Systematic Approach to Health
   - Leading Health Indicators
   - Healthy People 2010 Objectives
   - Promoting Health and Preventing Disease
   - Community needs assessment
   - Strategy to prevent disease e.g., childhood immunization
   - Strategy to detect disease e.g., screening activities
   - Evaluation of Health Promotion and Disease Prevention activities

Section 2: Understanding Managed Care Concepts
   - Overview of Managed Care

Section 3: Health and Illness
   - Definitions and meaning of health
   - Illness, sickness, and disease
   - Health Behavior and Health Education Theories
   - The Meaning of signs and symptoms
   - Acute vs. Chronic problems

Section 4: Providers in the Health Care System
   - Pharmacy: The Profession, Settings, & Practice
   - Pharmaceutical Education, Organizations, & Periodicals
   - Images of Pharmacists and Pharmacies
   - Other health care providers and the Pharmacist
   - Unorthodox healing systems

Section 5: Choosing a Therapeutic Agent
   - Determinants of prescribing behavior
   - Prescribing theory

   - Pharmacists’ performance in drug product selection and therapeutic interchange
   - Interprofessional relations in drug therapy decisions
   - Consumer behavior regarding the choice of prescription and non-prescription medications

Section 6: Medication-Taking Behavior
   - Compliance
   - Determinants of medication use
   - Predicting and detecting noncompliance
   - Explaining and changing non-compliant behavior

Section 7: Special Classes of Patients and Situations
   - The elderly
   - Coping with Illness
   - Depression
   - Children and Medicines
   - Adolescents and College students
   - Ambulatory elderly
   - Long-term pharmaceutical care: social and professional implications
   - Suicide
   - Death and Dying
   - Hospitalized patients
   - Pharmaceutical care of terminally ill patients
   - Mental disorders
   - Cultural issues in the practice of pharmacy

Section 8: Outcomes of Pharmaceutical Care
   - Clinical Outcomes
   - Economic Outcomes
   - Humanistic Outcomes
   - Pharmacoeconomic Case Studies

Section 9: Useful Concepts in Pharmacy Practice
   - A macro view: Public policy
   - The “rebirth” of cognitive services
   - Recent developments in behavioral medicine
   - Expectations, Education and Technology
   - Ethical concerns in drug research

APPENDIX C: SAMPLE INSTRUCTIONAL CASE
STUDY FOR ECONOMIC EVALUATIONS

Discounting
At Shedicas Co., an asthma management program is going to be implemented over a period of four years at a cost of $1,000 per year. The costs are realized at the end of each year and discount rate is 6 percent, (i) What is the unadjusted cost over the four years? (ii) What is the discounted cost over the four years?

Sensitivity Analysis
Calculate discounted cost for above problem using two and four percent discount rate.

Cost-Of-Illness
In a large-scale study, cost data was collected from 100 HIV infected subjects from time of infection until death on following –
   - Inpatient hospitalization - $500,000
   - Outpatient visits - $125,000
   - Home health care - $75,000
   - Medication costs - $250,000
   - Long-term care - $175,000
Based on this data, what is the cost-of-illness for an HIV patient from diagnosis until death?

Cost-Minimization Analysis
You are a pharmacist at Shedicas Hospital. A diabetic patient has just been admitted and you have been consulted by his primary physician to advice on whether to choose Drug A or Drug B. You have the following information.
• Drugs A and B are equivalent considering clinical efficacy, and adverse events.
• Drug A costs $25 per dose and will have to be administered for a total of 15 doses. Route of administration for Drug A is oral and cost of administration is $0.50 per dose.
• Drug B costs $20 per dose and will have to be administered for a total of 10 doses. Route of administration for Drug B is I.V. and cost of administration is $15 per dose.
Which drug would you suggest?

Cost-Benefit Analysis
Given the following information about Therapies A, B, and C for each patient stay in a hospital, use both cost-benefit ratio and net benefit to identify the therapy with the highest net benefit.

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Total cost</th>
<th>Total benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy A</td>
<td>$80</td>
<td>$300</td>
</tr>
<tr>
<td>Therapy B</td>
<td>$95</td>
<td>$350</td>
</tr>
<tr>
<td>Therapy C</td>
<td>$100</td>
<td>$495</td>
</tr>
</tbody>
</table>

Cost-Effectiveness Analysis
The following information is about three antibiotics - A, B, and C - used to treat an infection: (i) use cost-effectiveness ratio to identify your therapy of choice; (ii) calculate the incremental difference between Therapy A and the other two; and (iii) calculate the marginal cost of therapy comparing Therapy A to B, and Therapy A to C.
Base your calculations on 100 patients.

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Cost</th>
<th>Effectiveness (cure rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy A</td>
<td>$50</td>
<td>80%</td>
</tr>
<tr>
<td>Therapy B</td>
<td>$70</td>
<td>90%</td>
</tr>
<tr>
<td>Therapy C</td>
<td>$95</td>
<td>92%</td>
</tr>
</tbody>
</table>

Cost-Utility Analysis
Calculate the cost-utility ratio for Therapy A it will cost $7,500 to gain six more years for a patient with each year having a utility of 0.3.

APPENDIX D. GUIDELINES PROVIDED TO STUDENTS FOR COURSE ASSESSMENTS

Recitation Presentations (10% Of Final Grade)
Presentations will be in groups of two. Each student group will be responsible for an assigned class topic (to be picked in class today). During class presentations, each group is expected to make a 20-minute presentation (each student must present half of the assigned topic, at least 10 minutes each) using overhead projection. Questions from other students will be addressed at the end of the presentation. Your presentation should be a summary of assigned reading(s) for the topic. You may consult with the instructor about the topic before your presentation. Students responsible for class presentation should identify and discuss at least one additional reference relevant to your topic. You are expected to distribute a summary of your presentation and references cited. You will be evaluated on content, grammar and comprehension. Be creative, original and have fun writing it. Any cheating or copying of other student’s work will earn you zero.

Community Project (30% Of Final Grade)
Section I focuses on building a healthy nation and the role of pharmacists in promoting health and preventing disease. As a pharmacist, your contribution to your community is very significant in educating them on health issues. Reaching out to the community requires educating at places where those who need it the most or who are less likely to be informed often go. This project is one of the most significant (you can tell by the 30% grade) in this class. You are expected to provide education on a health promotion or disease prevention activity. Your assignment is as follows:
1. You are expected to work in groups of five - choose your group member wisely.
2. Choose a community site you are comfortable with e.g., barber shop, beauty salon, massage parlor, church, mechanic garage, car wash, fish market, etc. Consult with your teaching assistant and obtain approval from him/her before confirming your site. Please choose an area that is easily accessible because your teaching assistant and/or instructor will be grading your community project at the site. You need to be able to justify the site you chose during your poster presentation.
3. Choose a health promotion or disease prevention activity your group will focus on e.g., childhood immunization, adult immunization, mammography, breast examination, prostate cancer screening, cholesterol screening etc. Obtain activity approval from Dr. Odedina before signing up with the teaching assistant. No two groups in the same class can choose same activity.
4. Obtain resources (from local organizations, Internet, recent literature, books, expert consultations, etc.) and develop your educational materials that will be placed at your site. The teaching assistant should verify validity of your materials before you place at the site. Feel free to work with FAMU clinical faculty if you wish or other experts outside the college for successful implementation of your project.
5. Place your educational materials at a conspicuous place at your site and provide appropriate details to individuals working at the site about encouraging customers to pick up the educational materials (e.g., “do you know that African-American men are more likely to die from prostate cancer? It is important that African-American men aged 40 and above get screened for prostate cancer every year because early detection is very important). Encourage individuals working at your site to bring up your health promotion/disease prevention activity in conversation with their clients.
6. At five different times, one of your group members should be at the site for at least one hour to encourage discussion and educate about your activity. Provide the time schedule you plan to be at your site to your teaching assistant. Your teaching assistant will visit the site during one of these times to grade your community project (don’t ask him/her when the visit will be).
7. Your community project should be at the site for at least four weeks.

Healthy People 2010 Objectives Paper (10% Of Final Grade)
Choose one “Healthy People 2010 Objective.” Answer the following in your paper:
1. What do you understand by this objective? (10% of your grade)
2. Conduct a literature review (at least five references) on the objective’s health topic and summarize your review. (20% of your grade)
3. What are the foreseen obstacles towards achieving the objective in the year 2010? (30% of your grade)
4. How can pharmacists help overcome these obstacles to achieve the objective in the year 2010? (30% of your grade)
5. Paper organization, creativity, and style is 10% of your grade.

Your paper should not be more than two single-spaced typewritten pages. Your paper should include a topic, introduction, body, conclusion and references cited. You will be evaluated on content, grammar and comprehension. Be creative, original and have fun writing it. Any cheating or copying of other student’s work will earn you zero.
8. Present your community project in a poster presentation as indicated on your class schedule. You may want to include pictures of your community project setup on the poster board.

Research Paper (10% Of Final Grade)
In Section 7, you were introduced to pharmacists’ responsibilities in dealing with the following special classes of patients –
• Long term care patients
• Hospitalized patients
• Terminally ill patients
• Patients with mental disorders.

Choose one of the above classes of patients for your paper. In a three-page, double-spaced, typewritten paper, do the following:
• Write a brief introduction about the class of patients you have chosen.
• Conduct an interview with a pharmacist that works with this class of patients on the types of services he/she provides. In your paper, list these services.
• Talk with a patient or a caregiver (a caregiver is a spouse, daughter, son or family member caring for the patient regularly) in your chosen class of patients on the types of services he/she would like pharmacists to provide. In your paper, list these services.
• Compare and contrast the services pharmacists provide with those the patient/caregiver wants.

Along with your paper (not part of the three pages), submit the following:
• Pharmacist interview: Name of pharmacist interviewed, affiliation, date and time of interview, and interview transcript.
• Patient interview: Name of patient interviewed, where patient is staying (home, hospital, mental health institution, etc.), date and time of interview, and interview transcript.

Guideline for paper
• Title
• Introduction (20%)
• Pharmacists’ services (20%)
• Services desired by patients/caregivers (20%)
• Gaps in services provided and desired (20%)
• Conclusion (10%)
• Paper Organization is 10%

NOTE: YOUR INTERVIEW COULD BE FACE-TO-FACE OR BY TELEPHONE.

APPENDIX E. INSTRUCTORS’ REFLECTIONS

Dr. Folakemi T. Odedina
The major reason for implementing the innovation stems from a negative experience as a pharmacy student. None of my professors made an attempt to truly confirm that the learning objectives for their classes were achieved nor did they make an effort to actively engage or interest the students in class. The emphasis was on knowing but not doing - thus students resolve to memorizing the materials. This left a feeling of frustration when I graduated because I knew the materials but felt I could not do what was required as a pharmacist.

Years later, as a professor I fell into the same “teaching habit” as my former professors whom I constantly criticized while in pharmacy school. With only the traditional “stand up and lecture” teaching method, students were not actively engaged in their learning nor interested in the lecture materials. It was also difficult to make sure that the learning objectives for the course were achieved. Seeing the same expressions on my students that I had in pharmacy school, it was time for me to make a change. Not only for my students’ sake but for my sake because the “traditional teaching” was rapidly decreasing my interests in teaching. It was becoming extremely difficult to look forward to going to class or get excited about class. With the multifaceted learning approach implemented in the course, the zeal is back and it is great to see students get excited about class.

Ms. C. Denise Clemmons
I had the opportunity to work as Dr. Odedina’s teaching assistant for her Pharmacy Healthcare and Behavior class. One of my jobs as her teaching assistant was to go around and visit each group of students at their community project site. Looking back I can truly say that these students took their project very seriously. They were very eager to talk to me about their projects and I was very eager to listen. Many times their faces would light up as they told me about how someone asked them questions or how someone visited their project repeatedly just to get more information. I was very proud of these students and you could tell they were proud of themselves.

Sometimes, when visiting a project site, I would have the occasion to be there while someone was asking a question. One time in particular I went to visit a project that was located in a community center. The project was about Nutrition and was geared towards children. The community site was definitely a good choice because there were lots of children attending after school programs at the site. When I got to the project site, I was extremely pleased to see the students talking to children who ranged in ages from five to ten. There was one little boy off to the side attempting to fill out a crossword puzzle that was related to nutrition. He would periodically run up to look at the students’ poster board to find an answer to one of the questions in his puzzle. Once he was finished he hurried to get in front of the other kids who were still finding answers to announce he was finished and was ready for his prize; he wanted his apple and banana. He was smiling, the students were smiling, and I was smiling.

Instances like the one mentioned above made me forget that I was traveling all over Tallahassee to visit each community project. I was just as enthusiastic as the students to see what I would observe next. The student did an excellent job and they all deserve a pat on the back, but not only should they be commended but so should Dr. Odedina. Dr. Odedina gave these students the chance to experience the joy that their future profession has in store for them.

Ms. Nikita Dukes
As a lab instructor and teaching assistant in the class Pharmacy Health Care and Behavior (PHA 4724), I was given the responsibility of overseeing the lab for the class. In the lab the students were required to do 30-minute presentations based on lecture material that was assigned in the syllabus. Students were also required to do a community project that consisted of them going out into the community and promoting a topic of interest to them. Upon completion of this assignment students were then asked to present the project in poster form on a designated day to the students, faculty and staff of the College of Pharmacy. Inadvertently, students were broken up into groups and all assignments were completed as a group.

This type of approach was innovative because students were required to think about issues and be more observant of their peers. The more we got students communicating through discussion, group work and other forms of verbalization, the more it was realized that they were acquiring skills they could use in their practice. Students told me, by interacting with each other on group projects, they were learning to work cooperatively, a skill that is essential to success in today’s workplace.