Use of Web Technology and Active Learning Strategies in a Quality Assessment Methods Course

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The use of Web technology to enhance active student learning in a required PharmD course, Quality Assessment Methods in Health Care is described and evaluated. The course is designed to meet new competencies for pharmacy practice. The one credit course was designed for seven two-hour class sessions. Each section was comprised of 30-33 students. WebCT® a course management software, was used to post course syllabus, lecture slides, course calendar, readings, and assignments. WebCT, also allowed for student’s email, use of bulletin board for posting questions for class discussion, and three online quizzes. Active learning strategies included bulletin board and classroom discussions; innovative written assignments; and participation in a game called “Risk-Sharing.” In this knowledge game, student teams were required to answer Jeopardy®-like questions. Student learning was assessed using graded and non-graded components. Baseline and post-course knowledge were assessed. Pre- and post-course surveys examining perceptions of competencies and instructional methods were conducted. Comments from student evaluations are also provided.

INTRODUCTION
Quality assessment principles are an integral component of the education of pharmacy students. The 1998 version of the AACP Center for the Advancement of Pharmaceutical Education’s (CAPE) Educational Outcomes has incorporated competencies that recognize this fact in the professional outcomes titled, “manage medication use systems.”(1) A required one-credit course for Doctor of Pharmacy students that addressed these new competencies was designed. The teaching of concepts in quality assessment presents a challenge as they are difficult for most pharmacy students with limited practice experiences. Students also have difficulty understanding and appreciating the significance of these concepts for their professional career. This course used Web-based technology to facilitate active learning and achieve the desired learning outcomes. Active learning is defined as “anything that involves students in doing things and thinking about the things they are doing.”(2) Bonwell and Eison described characteristics of active learning including:

• “students are involved in more than listening;
• less emphasis is placed on transmitting information and more on developing students’ skills;
• students are involved in higher-order thinking (analysis, synthesis, writing);
• students are engaged in activities (reading, discussing, writing).”(2)

This report describes and evaluates quality assessment methods in a health care course that utilized web technology and various active learning strategies.

GOALS
Course design principles were chosen from Chickering and Gamson’s Seven Principles for Good Practice in Undergraduate Education(3). These include:

• encourages contacts between students and faculty;
• develops reciprocity and cooperation among students;
• uses active learning techniques;
• gives prompt feedback;
• emphasizes time on task;
• communicate high expectations; and
• respects diverse talents and ways of learning.

The instructional goals for this course are designed to enable the students to develop the competencies in which the student can apply principles of quality assessment methods to the evaluation of pharmaceutical care processes and can participate in the pharmaceutical care system’s process for conducting drug use evaluations. Specific instructional goals addressed are listed in Appendix A. Behavioral objectives for the instructional goals are found in Appendix B. Many of the learning objectives that address knowledge and comprehension levels of learning are accomplished through the instructional strategies of reviewing content on the Web, periodic quizzes, and a creative knowledge game. Higher levels of learning such as application, analysis, synthesis, and evaluation, are achieved through innovative written assignments, electronic bulletin board and classroom discussions.

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Table I. Features of WebCT® used in quality assessment methods in health care

<table>
<thead>
<tr>
<th>Feature</th>
<th>Usage</th>
</tr>
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<tbody>
<tr>
<td><strong>Course Pages</strong></td>
<td>Used to post:</td>
</tr>
<tr>
<td></td>
<td>• Course syllabus</td>
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<tr>
<td></td>
<td>• Course readings in a portable document file</td>
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<tr>
<td></td>
<td>• Assignment one drug use evaluation studies in a portable document file</td>
</tr>
<tr>
<td></td>
<td>• Slide presentations (traditionally used during lectures)</td>
</tr>
<tr>
<td><strong>Bulletin Board</strong></td>
<td>Facilitated:</td>
</tr>
<tr>
<td></td>
<td>• Postings of discussion questions for use by students and faculty during class sessions</td>
</tr>
<tr>
<td></td>
<td>• Distribution of guidelines for assignments</td>
</tr>
<tr>
<td></td>
<td>• Students signing up as teams for assignment involving choosing a practice-based quality problem</td>
</tr>
<tr>
<td></td>
<td>• Communication by faculty to all students in the class</td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td>Available:</td>
</tr>
<tr>
<td></td>
<td>• Private communication between students and faculty and between students and students</td>
</tr>
<tr>
<td><strong>Student Management</strong></td>
<td>Used by the faculty to record and post grades for students</td>
</tr>
<tr>
<td><strong>Online Chat</strong></td>
<td>Facilitated:</td>
</tr>
<tr>
<td></td>
<td>• Meetings for group assignment</td>
</tr>
<tr>
<td><strong>Quiz/Surveys</strong></td>
<td>Provided:</td>
</tr>
<tr>
<td></td>
<td>• Three online quizzes</td>
</tr>
<tr>
<td></td>
<td>• Pre and post course surveys examining perceptions of competencies and instructional methods</td>
</tr>
<tr>
<td></td>
<td>• Pre and post course assessments of knowledge</td>
</tr>
<tr>
<td></td>
<td>• Final course evaluation</td>
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</table>

**COURSE DESCRIPTION**

A one-credit course was designed to address specific quality assessment methods (QA) concepts. These concepts include basic QA concepts such as:

- structure, process, and outcomes (SPO) and continuous quality improvement (CQI);
- drug use management tools such as drug utilization review, drug usage evaluation, drug regimen review and medication usage indicators;
- health care management tools such as clinical pathways, disease management, clinical practice guidelines, and report cards; and
- accreditation, and regulation concepts.

The course is required in the final professional year of the entry-level PharmD program. It is offered during both the fall and spring semesters to two class sections each semester. Each class section is comprised of 30-33 students with each section meeting for seven two-hour class sessions.

Class time is not used for lecturing but for active learning strategies. The use of WebCT® technology, a course management software, facilitates the incorporation of active learning in the course. Table I highlights the features of WebCT® and how these were used in the Quality Assessment Methods in Health Care course. A student survey indicated that they had never previously used WebCT® or any other online course management software. The first class session is devoted to a review of the features of WebCT® and instruction on its uses. Faculty in the Division of Continuing Education at the University have published a Student Guide to WebCT® that also facilitates training on use of this software(4). The WebCT® course site was accessed by 65 students in the Fall semester 7,309 times.

The students were asked to review course content posted on the WebCT® course page. They were then required to post a minimum of four questions for classroom discussions to the WebCT® bulletin board during the course. These postings addressed the four major content areas of the course. There was online dialogue among the students for some questions. These postings encouraged analysis and synthesis of course content. Classroom time was used to answer students’ questions regarding the readings, and presentation slides posted on the WebCT® course page and discuss students’ questions posted to the bulletin board.

Students were required to submit a written report addressing the guidelines for a published drug usage evaluation study (Appendix C). These guidelines and criteria were posted on the WebCT® bulletin board. Classroom time was subsequently used to discuss these various published studies. A group written assignment required a team consisting of three students select a specific practice-based quality problem from a given list of scenarios (Appendix D). The students signed up for this assignment using the WebCT® bulletin board. WebCT®’s chat rooms and email function facilitated communication within the groups. Guidelines for this assignment included five pages maximum group report that consisted of:

- a clear statement of the problem including documentation of the nature of the problem, significance, and extent of the problem with supporting literature;
- choosing a quality assessment tool to address the problem (the tool needed to be appropriate to quantify the problem and improve the quality of care); and
- design this quality assessment tool to provide a solution to the problem (adapting a tool based on existing literature).

Both written assignments facilitated learning at the higher levels of Bloom’s Taxonomy including analysis, synthesis and evaluation. Classroom time was used to discuss unselected sample practice scenarios and the approach to completing the assignment.

The final in-class exercise involved students participating in teams of 5-6 members for a game the authors developed called “Risk-Sharing.” This game is modeled after the “Jeopardy®” television show. Each team was asked to answer
Table II. Assessment of student learning

<table>
<thead>
<tr>
<th>Graded</th>
<th>45%</th>
<th>40%</th>
<th>12%</th>
<th>3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three online quizzes</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Two written assignments</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>“Risk-sharing” game</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulletin board postings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not contributing to student’s grade:
- Pre and post course knowledge
- Pre and post course surveys:
  - Perceptions of competencies
  - Perceptions of instructional methods

Fig. 1. Grade distributions.

A research assessment of learning was also performed. Baseline and post course knowledge were assessed. The identical test was administered for the baseline and post course assessment. This assessment consisted of twelve multiple-choice questions that assessed selected behavioral objectives for the course. Results are noted in Table III. These results indicate an improvement in students’ knowledge of quality assessment methods. These items had been previously validated by previous administration in a quality assessment course for non-traditional PharmD students.

Online quizzes were administered using WebCT®. The quiz questions assessed learning of the behavioral objectives. These questions had also been validated by previous administration to nontraditional PharmD students. WebCT® allows for randomization of exam questions. The software also provides statistical evaluations of exam questions. This feature helped us to improve future test questions. Three online quizzes were administered during the course. These quizzes were proctored in a computer laboratory classroom. Scores are summarized in Table IV. The average scores were acceptable and demonstrated evidence of learning. Discrimination analysis between the upper 25 percent and lower 25 percent for quiz questions indicated that 67 percent of questions (31 out of 46) were above 0.3. This indicated that many of questions could discriminate the upper 25 percent and the lower 25 percent of the class.

The authors had an opportunity to perform test-retest reliability. For one section of the class, a technology failure during quiz one necessitated the administration of a pen and paper test. A subsequent retesting online two weeks later was done. Results are shown in Table V. Students achieved slightly lower marks upon retesting. This may be attributed to the lapse of two weeks upon retesting or to the fact that students knew that
Table VI. Comparisons of pre and post course perceptions of competencies and instructional methods — Fall 99

<table>
<thead>
<tr>
<th></th>
<th>Mean&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-course</td>
<td>Post-course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>I understand the value of quality assessment methods to future pharmacy practice.</td>
<td>2.43</td>
<td>2.29</td>
<td>0.420</td>
</tr>
<tr>
<td>2.</td>
<td>I can apply principles of quality assessment methods to the evaluation of pharmaceutical care processes.</td>
<td>2.72</td>
<td>2.45</td>
<td>0.093</td>
</tr>
<tr>
<td>3.</td>
<td>I can identify structure measures of quality for pharmaceutical care.</td>
<td>2.97</td>
<td>2.22</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>4.</td>
<td>I can identify process measures of quality for pharmaceutical care.</td>
<td>3.20</td>
<td>2.28</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>5.</td>
<td>I can identify outcomes measures of quality for pharmaceutical care.</td>
<td>2.68</td>
<td>2.18</td>
<td>0.0034</td>
</tr>
<tr>
<td>6.</td>
<td>I can identify elements of continuous quality improvement.</td>
<td>2.98</td>
<td>2.26</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>7.</td>
<td>I can differentiate among drug use management methods such as drug regimen review, drug usage evaluation and drug utilization review to evaluate quality.</td>
<td>2.68</td>
<td>2.65</td>
<td>0.778</td>
</tr>
<tr>
<td>8.</td>
<td>I can apply drug use management methods such as drug regimen review, drug usage evaluation and drug utilization review to evaluate quality.</td>
<td>2.66</td>
<td>2.29</td>
<td>0.020</td>
</tr>
<tr>
<td>9.</td>
<td>I can identify the components of critical pathways.</td>
<td>2.95</td>
<td>2.37</td>
<td>0.0004</td>
</tr>
<tr>
<td>10.</td>
<td>I can identify the components of clinical practice guidelines.</td>
<td>3.14</td>
<td>2.12</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>11.</td>
<td>I can identify the components of disease management.</td>
<td>2.48</td>
<td>2.18</td>
<td>0.0745</td>
</tr>
<tr>
<td>12.</td>
<td>I can define the role of accrediting and regulatory bodies in maintaining quality.</td>
<td>3.14</td>
<td>2.40</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>13.</td>
<td>I can define the purpose of report cards in assessing quality of health care.</td>
<td>2.89</td>
<td>2.57</td>
<td>0.0732</td>
</tr>
<tr>
<td>14.</td>
<td>I use computer technology to enhance learning.</td>
<td>1.83&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.48&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0071</td>
</tr>
<tr>
<td>15.</td>
<td>Instructional methods utilizing computer technology such as bulletin boards facilitate learning.</td>
<td>2.62</td>
<td>2.37</td>
<td>0.2190</td>
</tr>
<tr>
<td>16.</td>
<td>I use bulletin boards to participate in class discussions.</td>
<td>2.65&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.72&lt;sup&gt;c&lt;/sup&gt;</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>17.</td>
<td>Class notes on the Internet are valuable.</td>
<td>1.92</td>
<td>2.03</td>
<td>0.4308</td>
</tr>
<tr>
<td>18.</td>
<td>Working in a group is enhanced with use of bulletin boards.</td>
<td>2.92</td>
<td>2.68</td>
<td>0.2581</td>
</tr>
<tr>
<td>19.</td>
<td>Periodic class quizzes, i.e., session two, four and six, facilitates learning of content.</td>
<td>2.83</td>
<td>2.66</td>
<td>0.4770</td>
</tr>
<tr>
<td>20.</td>
<td>I prefer taking online exams rather than pen and paper exams.</td>
<td>3.54</td>
<td>2.94</td>
<td>0.0079</td>
</tr>
<tr>
<td>21.</td>
<td>Online quizzes are helpful in facilitating my learning of the course content.</td>
<td>2.75</td>
<td>2.75</td>
<td>0.9305</td>
</tr>
<tr>
<td>22.</td>
<td>Signing up for a group project online is convenient.</td>
<td>3.12</td>
<td>2.66</td>
<td>0.0227</td>
</tr>
<tr>
<td>23.</td>
<td>The learning of drug usage evaluation is enhanced by an assignment that requires evaluation of published reports.</td>
<td>2.52</td>
<td>2.29</td>
<td>0.2135</td>
</tr>
<tr>
<td>24.</td>
<td>The learning of a specific quality assessment tool is enhanced by a group assignment that requires identifying, choosing and justifying a quality assessment tool.</td>
<td>2.45</td>
<td>2.52</td>
<td>0.5833</td>
</tr>
<tr>
<td>25.</td>
<td>I prefer scheduled class time with lecturing over use of computer technology.</td>
<td>2.86</td>
<td>3.17</td>
<td>0.1649</td>
</tr>
<tr>
<td>26.</td>
<td>I prefer scheduled class time with lecturing over use of active learning methods.</td>
<td>3.14</td>
<td>3.38</td>
<td>0.2273</td>
</tr>
<tr>
<td>27.</td>
<td>I prefer use of computer technology over scheduled class time with lecturing.</td>
<td>2.86</td>
<td>2.82</td>
<td>0.8205</td>
</tr>
<tr>
<td>28.</td>
<td>I prefer use of active learning methods over scheduled class time with lecturing.</td>
<td>2.68</td>
<td>2.43</td>
<td>0.1750</td>
</tr>
</tbody>
</table>

<sup>a</sup>Responses were 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree.

<sup>b</sup>Using Wilcoxon signed rank test.

<sup>c</sup>Responses for questions number 14 and 16 were 1 = frequently, 2 = occasionally and 3 = not at all.

Retesting did not count for their grades. These results also illustrate that the method of testing did not appear to adversely affect students since scores did not differ markedly between an online and pen and paper test.

Immediate and regular feedback on all assessments of student learning was provided. The use of email facilitated the provision of feedback. The inclusion of an icon called “my record” on the WebCT<sup>®</sup> course page provided for release of individual grades in a secure environment.

Anonymous surveys were administered using WebCT<sup>®</sup>. These surveys also provided assessments of student learning and course feedback (Table II). Results are noted in Table VI. The comparisons of pre- and post-course surveys revealed enhanced competencies as perceived by the students especially for knowledge and comprehension levels of learning. Students’ perceptions of the instructional strategies also
improved after taking the course especially for online exams and for signing up for a group project online. However, higher levels of learning such as application, analysis, synthesis, and evaluation and student perceptions of many of the instructional strategies did not statistically improve after taking the course. These findings are not too surprising in view of the fact that student confidence is less likely to be enhanced after one or two assignments that provided opportunity for these learning outcomes. Student perceptions of group work became more negative after participating in a group project. This may be explained by the fear that group work may adversely affect grade performance. This course was also a major paradigm shift in education for the students. Most instructional strategies prior to this course utilized passive learning approaches. Students who have been socialized to these approaches are likely to be resistant to active learning strategies(2).

The results of the course evaluations were generally positive. General comments from the student evaluations are noted in Appendix F. One student emailed on instructor with these comments: “you are to be commended for thinking outside the box. It has been brought to my attention that a large majority of managers and institutions are looking for PharmDs that are able to think along these lines. I commend you for recognizing that PharmDs need to be well versed in this area, unlike many other programs that don’t seem to be as much on the cutting edge.”

DISCUSSION

In 1986, Knapp, Michocki, Wiser and Moran described a flexible module for teaching quality assurance drug prescribing review concepts(5). Their instructional design was the use of a case-based approach. Although a case-based approach is an effective active learning strategy, we decided to use Web-based technology to enhance active student learning in 1999. Although other pharmacy school faculty have described the use of Web technology in various instructional venues, there have been no reports describing nor evaluating the use of Web technology and active learning strategies in the design of a new course in quality assessment methods(6-8). Also, quality assessment concepts beyond traditional drug use review and evaluation are an important foundation for managing medication use in a changing health care system. These concepts needed to be included in the design of the course that addressed these new educational competencies.

The authors recognized that using traditional strategies would not be desirable for achieving the learning outcomes in an interesting and positive way. In 1991, Rifflee suggested that computer technology can enhance presentation of principles but did not provide evidence to support enhanced learning(9). By 1999, entry level PharmD students at Duquesne University had experienced the use of computer based presentations and used other computer-assisted tools. However, none of these students at our institution had ever used a course management software such as WebCT, in any coursework. The scope of available features provided an opportunity to experiment with new instructional strategies for offering and assessing a non-online course in the entry level PharmD program. The use of Web-based technology also would facilitate the incorporation of active learning strategies in a relatively large class, i.e., 60 to 65 students. It is clear from the education literature that learning occurs when students are actively engaged in the process and have the opportunity to interact and think about a subject area(2, 10-11).

The design of this course adheres to Chickering and Gamson’s, “Seven Principles for Good Practice in Undergraduate Education(3).” Encouraging contact between students and faculty was facilitated with the use of an electronic bulletin board for posting discussion questions, classroom discussions, and a group written assignment. Developing reciprocity and cooperation among students was encouraged with the online discussions among the students with the posted questions and the group written assignment. Various active learning strategies were used. The use of WebCT® features such as email, “my record” and course calendar facilitated prompt feedback and kept students on task. Incorporation of a diversity of active teaching strategies communicates high expectations and addresses individual learning styles.

The instructors enjoyed teaching this course. The use of an electronic bulletin board for posting discussion questions allowed the instructors to get to know the students quite well. The instructors were able to monitor understanding throughout the course and thus focus classroom time on areas of need. WebCT® also facilitated course management by the online quizzing and record keeping features. The descriptive statistics provided with the quizzing feature were very helpful in analyzing exam items for validity. The final “Risk-Sharing” game was an exciting way to conclude the course. The students enjoyed the novelty method of reviewing course objectives. In their words, “it sure beat taking a comprehensive final exam.” The data supports learning in this Quality Assessment Methods in Health Care course. The first offering of the course can be judged successful by student performance, evaluations and student assessments provided. The instructors were pleased with the outcomes achieved and the educational pedagogy used for this course.

The instructors learned numerous lessons from the design of this course. This course was the first time the instructors used WebCT® in the instructional design of a course. The authors learned the limitations of the software in terms of online quizzes. The WebCT® database is a relatively static system. Thus all of the quizzes need to be prepared and available on the WebCT® exam site prior to students’ logging in for the first quiz. If this is not done, the next time students attempt a second quiz on the exam site, they will not be able to view the quiz. This also taught us that you should always anticipate technology failures and make appropriate backup plans in case of failures. When administering online exams, you need to make sure that you also have a hard copy of the exam. Proctored online exams also require the appropriate computer laboratory facilities. The authors chose to proctor the online quizzes by scheduling quizzes in a computer facility during a specified time frame. One of the authors (TP) has taught a similar course in an online nontraditional PharmD program. In this course for adult learners, one final exam is administered online for a specific time frame and is administered unproctored. Student performance in this online course is similar to the results with the entry-level PharmD students.

Students during the first offering commented on the need for further instruction on use of the Web technology. For the second offering during the Spring 2000 term, students were advised to purchase the Student Guide to WebCT®. The students during the first offering also printed up all of the Power Point, slides from the Web as most were still used to studying hard copy of notes. This habit was costly to our school’s computer printers. During the second offering, students were
advised to email the instructor to obtain a file copy of the Power Point, slides. During the second offering all quizzes were administered one full session after the content area was discussed in a class session. Instructions were also clarified on student’s expectations for reviewing the presentation slides prior to the class session on the topic.

Other modifications planned include a reassessment of the amount of work required for one credit or an expansion in the number of credits assigned with accompanying expanded details on the learning outcomes. Further clarifications on course requirements and expectations for assignments are also necessary.

CONCLUSIONS
In 2000, quality assessment concepts beyond the traditional drug use review and evaluation are an important foundation for managing medication use in a changing health care system. The authors believe that the approach described and evaluated can be used to address the quality assessment competencies. The use of web-based technology and active learning strategies should foster learning of these difficult concepts. This course was a major paradigm shift in education for the students. Thus, consideration to include similar instructional strategies in courses earlier in the curriculum is recommended.

References

APPENDIX A. INSTRUCTIONAL GOALS (1)

III. Manage Medication Use Systems

B. Participate in the pharmaceutical care system’s process for conducting drug use evaluations.

1. Develop appropriate criteria and outcome indicators.
   a. Identify appropriate drug for review.
   b. Identify appropriate criteria or indicators developed by regulatory agencies.
   c. Adapt and/or modify existing criteria for use in a given situation.

2. Conduct drug use evaluations.
   a. Collect data for a drug utilization review.
   b. Apply criteria to collected drug utilization review data.
   c. Implement corrective actions to improve drug use.

D. Apply principles of outcomes research and quality assessment methods to the evaluation of pharmaceutical care.

1. Use appropriate structure, process, and outcome measures to evaluate the quality of pharmaceutical care.
2. Apply elements of continuous quality improvement in pharmaceutical care.
3. Apply appropriate drug use management methods to evaluate the quality of pharmaceutical care.
5. Document quality assurance activities according to the specifications of relevant accrediting and regulatory bodies.
6. Use report cards in assessing the quality of health care.

APPENDIX B. SPECIFIC BEHAVIORAL OBJECTIVES FOR QUALITY ASSESSMENT METHODS IN HEALTH CARE

Structure, process, and outcomes (SPO) (Session 1)
1. Define Donabedian’s seven characteristics of quality used to evaluate health care.
2. Define absolutist, individualist, and societal perspectives that influence quality of health care.
3. Identify the perspective that pharmaceutical care represents.
4. Define Donabedian’s SPO process used to assess quality.
5. Identify examples of process criteria for pharmaceutical care.
6. Identify examples of structure criteria for pharmaceutical care.
7. Identify examples of outcome criteria for pharmaceutical care.
8. Apply knowledge of SPO during discussions.

Continuous quality improvement (Session 2)
1. Review the history and trends of the quality movement in pharmacy.
2. Define concepts of quality improvement.
3. Differentiate between quality assurance and quality improvement.
4. Define the FOCUS-PDCA (focus, organize, clarify, understand, select; plan, do, check and act) strategy used for continuous quality improvement.
5. Define quality improvement tools.
6. Identify elements of quality care delineated by the American Medical Association (AMA).
7. Describe key elements evaluated in the Medical Outcomes Study’s conceptual framework for quality.
8. Name three explicit methods used to judge quality and give examples of each.
9. Apply knowledge of CQI during discussions.

Drug use management tools (Session 3)
1. Define drug regimen review (DRR), drug usage evaluation (DUE) and drug utilization review. (DUR)
2. Identify the regulatory incentives for DRR, DUE, and DUR.
3. Define concurrent, prospective, and retrospective types of reviews.
4. Define terminology associated with drug use reviews including criteria, element, standard, indicators, and threshold.
5. Identify characteristics of drugs appropriate for drug use reviews.
6. Identify the steps for conducting a drug use review.
7. Identify methods used to improve drug use variations.
8. Identify limitations in the drug use review process.
9. Define medication use indicators.
10. Identify various types of medication use indicators.
11. Define terminology associated with indicators such as validity, sensitivity, and specificity.
12. Name key processes selected for medication use indicators and give examples.
13. Give examples of medication use indicators approved by the Joint Commission on Accreditation of Health Care Organizations (JCAHO).
3. Evaluate a published DUE using defined criteria.
4. Apply knowledge of drug use management tools during discussions.

Critical (clinical) pathways, clinical practice guidelines, and disease management (Session 5)
1. Define a critical pathway.
2. Identify marketplace factors leading to critical path development.
3. Differentiate critical pathways from other health care management tools such as case management, continuous quality improvement, outcomes management, and patient-focused care.
4. Differentiate between practice guidelines and critical pathways.
5. Identify goals for critical pathways.
6. Identify the steps in the critical path process.
7. Name the format used to document critical pathways.
8. Identify characteristics of topics selected for critical pathway development.
9. Identify limitations to critical pathways.
10. Identify the federal agency responsible for clinical practice guidelines.
11. Identify factors used in selecting topics for clinical practice guideline development.
12. Identify sources of information for clinical practice guidelines.
13. Define attributes of practice guidelines such as validity, reliability, clinical applicability, clinical flexibility, clarity, multidisciplinary process, scheduled review and documentation.
15. Identify potential barriers to implementation of practice guidelines.
17. Identify steps in developing a disease management program.
18. Identify the purpose of disease management programs.
19. Differentiate between risk sharing and capitated case management contracts for disease management program.
20. Identify limitations of disease management programs.
21. Identify the promises for disease management.
22. Given a specific practice issue or problem, select, design and support choice of a quality assessment method to address the issue.
23. Apply knowledge of health care management tools during discussions.

Accreditation, regulation and report cards (Session 7)
1. Identify the purpose and oversight health care role for governmental and nongovernmental health care agencies (i.e., OSHA, EPA, CDC, HCFA and JCAHO).
2. Identify the purpose and oversight health care role for various professional pharmacy organizations (i.e., ASHP, ACCP, AMCP, APhA, and ASCP).
3. Identify the accreditation changes promoted by JCAHO’s Agenda for Change.
4. Identify JCAHO hospital accreditation standards relevant to Pharmacy.
5. Define the purposes for the JCAHO Indicator Measurement System (IMSystem).
6. Identify the medical use process measured by the IMSystem.
7. Define the role and function of a Pharmacy and Therapeutics Committee.
8. Identify JCAHO requirements for adverse drug reaction (ADR) reporting.
10. Name two regulations relevant to ambulatory care.
11. Identify the relevance of OBRA 90 and CLIA ’88 regulations to pharmacy.
12. Define the categories of laboratory testing under CLIA ’88.
13. Identify examples of waived tests under CLIA ’88.
14. Identify the agencies and organizations involved in accreditation and standard setting for long term care, home care, and managed care.
15. Define the purpose of the Health Plan Employer Data and Information Set (HEDIS), and Oryx report cards.
16. Identify the role of the Foundation for Accountability (FACCT) in terms of health care quality.
17. Apply knowledge of accreditation and regulation during discussions.

APPENDIX C. GUIDELINES FOR EVALUATING A PUBLISHED DRUG USAGE EVALUATION STUDY

1. Assign responsibility
   Does report clearly delineate whose responsibility was for the DUE, DUR or DRR?
Is reason for conducting the drug evaluation stated? (Why was the drug selected for review?)
Is there multi-disciplinary involvement?

2. Delineate scope of drug use
   Does report delineate the scope of drug use including indications, dosing, monitoring parameters, duration of therapy, drug interactions, adverse drug reactions, and therapeutic outcomes?
Identify the structure, process and outcome criteria.

3. Identify specific drugs to be monitored and evaluated and important aspects of these drugs
   Are the specific aspects appropriate for the stated drug? Are the criteria clearly stated?
   Are the criteria measurable?

4. Establish thresholds for evaluation
   Are thresholds established?

5. Collect and organize data
   What type of data collection is specified? (i.e., retrospective, prospective, concurrent)?
   Is sample size defined?
   What are sources for data?

6. Evaluate drug use when thresholds are reached
   Is drug use evaluated when thresholds are reached?
   Are variations reviewed by a peer review process?

7. Take actions to solve problems or improve drug use
   Are corrective actions specified? What are they?
   Do these actions improve patient care and drug use?

8. Assess the effectiveness of the actions and document improvement
   Is there an element of continuous quality improvement?
   Is the evaluation repeated in an ongoing process?
9. Communicate relevant information to appropriate persons. Is there evidence that the findings from the evaluation are communicated to the appropriate persons? Who are these persons?

**APPENDIX D. SPECIFIC PRACTICE-BASED QUALITY PROBLEMS**

1. You are a managed care pharmacist who has been asked to address the underuse of beta-blockers in patients who have recently experienced a myocardial infarction.

2. You are an ambulatory pharmacist working with a large managed care organization who has been asked to review the monitoring of diabetic patients, specifically the low frequency of glycosylated hemoglobin values.

3. Costs of Procrit/Epogen have exceeded your budget estimates in a community hospital.

4. Your expenditures for low molecular weight heparin products have exceeded your original estimated usage based on previous patient admissions.

5. You are a community pharmacist in a rural area where one-half of the children under four years of age have not received the Hepatitis B vaccine.

6. Increasing numbers of elderly patients are experiencing confusion from cimetidine as part of their stress ulcer prophylaxis.

7. Increasing numbers of patients who are undergoing elective cardiac catheterization are requiring admission due to contrast nephropathy.

8. The administrator at a nursing home which you recently began serving has expressed concern about the use of psychoactive drug in the home.

9. You are a pharmacist at an HMO who is reviewing claims for patients with hypertension as a single diagnosis. You notice that 50 percent of patients are on two or more concurrent antihypertensive agents.

10. In your health care setting, a significant number of patients receiving NSAIDs are experiencing GI bleeds.

11. You are working as a consultant pharmacist in a LTC facility. Eighty percent of the population is female and only 5 percent of the prescriptions are for drugs such as Fosamax, Calcium, or Micacalcin.

12. You are a pharmacist working in a managed care setting. Emergency room visits for acute asthma attacks have increased sharply.

13. As a consultant pharmacist, you have seen that the primary agent used for the treatment of UTIs in the facility is ciprofloxacin.

14. As a hospital pharmacist responsible for ADR monitoring, you have noticed a marked increased in the number of patients experiencing acute tubular necrosis following aminoglycoside usage.

15. As an inpatient pharmacy supervisor at a community hospital, you observe that 50 percent of the patients undergoing hip replacement are receiving heparin therapy and 50 percent are receiving no therapy.

**APPENDIX E. REQUIRED READINGS FOR QUALITY ASSESSMENT METHODS IN HEALTH CARE**

- **Structure, process, and outcomes; and continuous quality improvement:**
  - Dinklage K: Using quality improvement tools to improve patient care processes. Pharmaguide to Clinical Medicine (Suppl) pp 4-7
  - PSAP II Module 5: The medication use system: accreditation and regulation, pp 122-123.

- **Drug Use Management Tools (drug utilization review, drug usage evaluation, medication usage indicators):**

- **Critical pathways, clinical practice guidelines and disease management:**
  - Lipsy R, Armstrong E: Clinical practice guidelines. PSAP III Module 5, pp 159-175.

- **Accreditation, regulation and report cards:**
  - PSAP II Module 5: The medication use system: accreditation and regulation; pp 105-138.

**APPENDIX F. GENERAL COMMENTS ON STUDENT EVALUATIONS**

Students often commented that they thought the following were the most effective in enhancing learning:
- Classroom discussion
- Power Point presentations online
- Online discussion questions
- Projects helped to bring the concepts in course together
- Jeopardy game brought everything together. It was also fun and an inventive way of reviewing material
- WebCT format of the class
- Periodic quizzing
- Real life examples and clarification of material during class

Improvements suggested by students to enhance learning:
- A lot of work for the amount of credits received.
- More real world examples of some terminology issues
- Less readings
- Review of online slides in class
- Further clarifications on assignments
- More interactions and discussions with the posted online questions