Development of a Professional Pharmacy Outcomes Assessment Plan Based on Student Abilities and Competencies

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A critical component of the PharmD curriculum reform process at the University of Nebraska was the development and implementation of an educational assessment plan to monitor programmatic abilities and competencies. A two-phase strategy was used to develop and implement this plan. Phase 1 surveyed other college/schools of pharmacy regarding methods used to evaluate student abilities and competencies. The results of this survey are described. Phase 2 utilized this, and other information to formulate the educational assessment plan. Implementation of this plan, together with the methods used to identify and correct omissions of programmatic abilities and competencies are described. The purpose of the educational assessment plan is to continuously monitor and improve the professional curriculum.

LITERATURE REVIEW

Considerable work has been published defining desired curriculum outcomes in health and pharmacy education. In the late 1980s, the American Association of Colleges of Pharmacy (AACP) Argus Commission reviewed the need for renewal in pharmaceutical education and initiated discussions concerning curricular outcomes. In 1990, a Focus Group on Liberalization of the Professional Curriculum was appointed by AACP President John Biles to develop a ten-year agenda for renewal in pharmaceutical education(1,2). The AACP Focus Group delineated its findings concerning the concepts of outcome goals and educational processes in the Commission to Implement Change in Pharmaceutical Education: Background Paper 11(3). The Commission reported that the mission of pharmacy practice is to render pharmaceutical care. Accordingly, entry-level pharmacy practice, for which pharmaceutical education prepares its students, is described within the concept of pharmaceutical care(3). Hence, the concept of pharmaceutical care in the mission of pharmacy practice and of ability-based goals were both endorsed by AACP.

The University of Michigan's Professional Preparation Network Project (1988) conducted a survey of 2,230 faculty members from 346 different United States colleges. Ten professional programs, including pharmacy at both the undergraduate/professional and master levels, were surveyed. Identified general outcomes included: conceptual, technical, integrative, contextual, interpersonal communication, and adaptive competencies(4). The AACP Commission to Implement Change in Pharmaceutical Education reviewed this listing and concluded that four broad minimum competencies were identifiable for professional education: conceptual competence, technical competence, integrative competence and career marketability(3).

As a result of the University of Nebraska College of Pharmacy (UNCP) reforming its Doctor of Pharmacy curriculum, an Educational Outcomes Committee (EOC) was created and charged with the development of a plan to assess educational outcomes. A two-phase strategy was developed. In Phase 1, the UNCP EOC sent an assessment survey to each college/school of pharmacy in the United States to obtain information regarding tools developed to assess student abilities and competencies. Information obtained in Phase 1 was used to identify and correct omissions of programmatic abilities and competencies. The purpose of the educational assessment plan is to continuously monitor and improve the professional curriculum.

PHASE 1. NATIONAL COLLEGES OF PHARMACY EDUCATIONAL OUTCOMES ASSESSMENT

Like many colleges and schools of pharmacy in the United States, the faculty of the University of Nebraska College of Pharmacy is reforming its Doctor of Pharmacy curriculum to emphasize educational outcomes using a student-centered, active learning environment. Critical to the success of this initiative is the development of effective methods to assess educational outcomes. Because of the lack of useful assessment-based health professions literature (including pharmacy), the College's EOC on January 6, 1998 sent a letter (survey) to the
dean of each college/school of pharmacy (COP) in the United States. The purpose of the survey was to gather data from each college/school regarding any tools developed "to assess or measure student abilities and competencies."

**Response Rate.** The initial mailing resulted in a 30.8 percent response rate (24 of 78 schools). A second letter and third mailing was sent to non-respondents that increased the response rate to 64.0 percent (50 of 78 schools). Several deans, or their representatives (associate dean of professional curriculum or chair of a curriculum assessment committee), responded in writing, by telephone or both.

**Results.** Responses to the survey were categorized into five primary areas: (i) assessment center approach; (ii) objective structured clinical examination (OSCE); (iii) educational outcomes assessment surveys; (iv) clerkship outcomes assessment; and (v) combination assessment approach.

**Assessment Center Approach.** The assessment center model applies a standardized procedure in which multiple assessment techniques (i.e., situational exercises and job simulations) are used to evaluate employee performance. In pharmacy education, Purkerson and Mason at Purdue University described a project focused on the assessment of four ability-based educational outcomes including group interaction, problem solving, written communication skills, and interpersonal communication skills. Results of this project showed that students did well in the exercises and believed their participation in the project was beneficial(5).

**Objective Structured Clinical Examination (OSCE).** The second category is the OSCE or "standardized patient" and has been used at the University of British Columbia by Fielding and co-workers(6) to assess pharmacists' continuing competence. Fielding's OSCE assessment consisting of 20 stations involved an average time of 2.5 hours per pharmacist. Monaghan and co-workers(7) assessed pharmacy student performance using this model as a clinical skills evaluation method. Monaghan believes that using the standardized patient may be the most comprehensive means of evaluating clinical skills in third and fourth professional years(7).

**Educational Outcomes Assessment Surveys.** A third category is a survey by students to assess their program's educational outcomes that were used by many schools either alone or in combination with other methods. Feldman, from the University of Georgia, sent a booklet titled, "Assessment of Teaching and Learning: Documentation and Strategies," that contains findings from three surveys administered to the first year (n=54 items), second year (n=119 items), and third year (n=166 items) professional students(8). A listing of instructional objectives for each year of the pharmacy curriculum was compiled and rated by the students. Upon completion of each year of the program, the survey asked the respondent whether they were "taught" and "can perform" each listed objective(8).

**Clerkship Outcomes Assessment.** A fourth category used by the University of Wisconsin was described by May and co-workers as an ability-based assessment program to facilitate the transition of physical therapy students from classroom to clinic(9). This program model was initially developed at Alverno College in Milwaukee, Wisconsin during the 1970s(10). Students rated their own levels of competency in each generic ability before and after their 18-week clinical internship. Instructors in their final clinical rotation also rated the student in each ability(9). Rodriguez at the University of Minnesota developed a similar approach in which the clerkship students self-assess their level of competency in sixteen general course competencies at the beginning of each clerkship rotation. Each preceptor examines the students' portfolio on the first rotation day to see what areas are in need of improvement, and from this determines focus areas.

**Combination Assessment Approach.** The fifth category is a combination of several different approaches. Davis at the University of Texas provided a copy of their 1997 Accreditation Self-Study Section on Evaluation via Outcomes that included: (i) NAPLEX results over a ten-year period; (ii) evaluation of degree outcomes using an alumni survey; (iii) retention rates of pharmacy graduates in rural area; (iv) internship performance evaluation by preceptors; and (v) students' evaluation of preceptors during internships.

**Summary and Discussion of Phase 1.** While considerable work has been done in defining educational outcomes in colleges/schools of pharmacy throughout the United States, education outcomes assessment still has a long way to go. Responses generally showed that most of the colleges/schools are in the beginning stages of the educational outcomes assessment, and therefore, had very little quantitative information to share. At the time of this assessment (1998), program respondents were most commonly employing the survey approach to assess educational outcomes, followed by the combination assessment approach, clerkship outcomes assessment, assessment center approach and the OSCE.

A limitation of the UNCP survey is that it provides only qualitative results. In 2000, Bouldin and Wilkin published the survey results of programmatic assessment in U.S. schools and colleges of pharmacy(11). They reported that 71 percent of respondent schools had approved a list of general education abilities and the most frequently cited instrument for programmatic assessment was the NAPLEX. While the present survey provided insight into the scope of programmatic assessment, future research should address quantifiable assessment methods and approaches.

Phase 2 describes the UNCP EOC's plan and how pertinent components from Phase 1 were integrated into the educational outcomes assessment program. Some of the components were used because of philosophical agreement and ease of use (i.e., assessment surveys, clerkship outcomes assessment). Others were not used due to resource requirements (i.e., assessment center approach), and some are currently being considered (i.e., OSCE).

**PHASE 2. REFORMED PHARMD CURRICULUM AND ASSESSMENT METHODS**

Systematic review of curriculum structure, content, and outcomes is managed by the Curriculum Committee (CC), in conjunction with the EOC and the Educational Reform Steering Committee (ERSC). The CC is responsible for content and assessment affecting the professional educational programs of the College, and ultimately, all actions by the CC must be approved by the Faculty. The CC is also responsible for reviewing course and programmatic assessment data to insure that expected abilities and competencies are being met in each year of the Program.

The EOC is responsible for matters related to instructional assessment techniques and assessment of educational outcomes of the professional program. Currently, the EOC is developing instruments and procedures for assessment of programmatic outcomes and methods for annual performance.

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1Personal communication: Dr. Raquel Rodriguez, Assistant Director for Experimental Education, University of Minnesota, July 27, 1998.

2Personal communication: Dr. Patricia Davis, Associate Dean, University of Texas, March 22, 1998.
hours/week clinical clerkships taken in the P-4 year that
professional responsibilities. The AEP is a series of ten, 40
community pharmacy, institutional pharmacy and drug
training, "preceptor shadowing" experiences in
activities throughout the first three years include aseptic
program and their professional pharmacy careers. Required
attitudes, skills, and competencies needed for the AEP
fundamentals of pharmacy practice in order to develop the
is to expose students early in their education to the
and competency outcomes. The purpose of the EPE Program
developed based on expected curricular programmatic ability
Program (AEP) are currently being phased-in and were
Competencies Guide (Appendix B). Both the Early Practice
Curriculum Abilities and
curriculum is given in Appendix A. Each course syllabus
contains pertinent abilities and competencies from the
Professional Program Curriculum Abilities and
Competencies Guide (Appendix B). Both the Early Practice
Experience (EPE) Program and the Advanced Experiential
Program (AEP) are currently being phased-in and were
developed based on expected curricular programmatic ability
and competency outcomes. The purpose of the EPE Program
is to expose students early in their education to the
fundamentals of pharmacy practice in order to develop the
attitudes, skills, and competencies needed for the AEP
program and their professional pharmacy careers. Required
activities throughout the first three years include aseptic
technique training, "preceptor shadowing" experiences in
community and institutional pharmacy, EPE clerkships in
community pharmacy, institutional pharmacy and drug
information, and experience-related tasks addressing
professional responsibilities. The AEP is a series of ten, 40
hours/week clinical clerkships taken in the P-4 year that
emphasize pharmaceutical care. Accordingly, the core
curriculum is designed to address the programmatic abilities and
competencies in a longitudinal manner. Thus, the curriculum
core and the practice areas are in concert with each other.

The Professional Program Curriculum Abilities and
Competencies Guide (Appendix B) was adapted from Background
Paper II that listed major entry-level functions/activities that
comprise pharmaceutical care at the entry level together with
recommendations for competencies necessary to perform
pharmaceutical care (3). The CAPE Advisory Panel on Educational
Outcomes Report (12) was used to develop the general education
abilities. Both the Background Paper II and the CAPE Report
were used to develop the initial list of general abilities
categorized into abilities (knowledge and attitude based)
and competencies (skills). Workgroups of faculty members wrote
specific category items within their areas of expertise and
scope of practice that were reviewed by the CC, and then
discussed and prioritized by the ERSC. The list was circulated
to the faculty for their input and then refined. The final list
was approved by the faculty. Faculty generally found the
development and approval of the specific abilities and
competencies a long and difficult process. While the Guide (final
listing) has been approved, a Continuous Quality Improvement
(CQI) process is being used by the CC and the EOC (Appendix C)
to further refine the abilities and competencies.

Assessment Methods Using the Curriculum Mapping
Procedure. Annually, students complete a Self-Assessment
Survey that lists the abilities and competencies that were
documented in course syllabi to be addressed throughout the year.
Assessment items were selected through a curriculum mapping
procedure that counts the number of courses where a specific
programmatic ability or competency is indicated in the course
syllabus. The Student Self-Assessment Survey was administered

<table>
<thead>
<tr>
<th>Communication ability</th>
<th>N</th>
<th>P-1</th>
<th>P-2</th>
<th>P-3</th>
<th>Total</th>
<th>Mean</th>
<th>P-1</th>
<th>P-2</th>
<th>P-3</th>
<th>P-1 to P-3 change</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. Write, speak and use data, media and computer technology accurately and clearly during communications with peers and teachers, patients, and other health care practitioners.</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>18</td>
<td>3.36</td>
<td>3.95</td>
<td>4.10</td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2. Interpret ideas, thoughts, and feelings communicated through reading, listening, aesthetic forms of communication, data, media, and computer technology.</td>
<td>9</td>
<td>7</td>
<td>3</td>
<td>19</td>
<td>3.42</td>
<td>3.87</td>
<td>4.10</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3. Identify personal strengths, weaknesses, barriers, and preferences in all modes of communication.</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>14</td>
<td>3.52</td>
<td>3.98</td>
<td>4.07</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1. Use writing, speaking, data and media creatively to convey convincing messages.</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>19</td>
<td>3.30</td>
<td>3.71</td>
<td>4.00</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1. Choose communication methods that are appropriate for the purpose of the interaction.</td>
<td>9</td>
<td>7</td>
<td>3</td>
<td>19</td>
<td>3.48</td>
<td>3.95</td>
<td>4.16</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C4. Interpret ideas, thoughts, and feelings with sensitivity to the cultural background of the sender.</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>16</td>
<td>3.42</td>
<td>3.57</td>
<td>3.92</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (mean)</td>
<td>46</td>
<td>36</td>
<td>20</td>
<td>105</td>
<td>(7.7)</td>
<td>(6)</td>
<td>(3.3)</td>
<td>(17.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Mapping procedure sums the number of courses in which a particular programmatic ability was cited in the First, Second or Third Year Student Self-Assessment Survey conducted in 2001.
2 Student self-assessment survey response scale: 1, for poor preparation to 5, for excellent preparation.
3 Improvement from P-1 year (mean) to the P-3 year (mean).
items, the P-1 student mean scores ranged from 1.64 to 3.63, Likert response scale from 1 (poor) to 5 (excellent). For these abilities, the P-1 students mean scores ranged from 3.30 to 3.52, suggesting an "average to good" preparation level.

Improvement from P-1 year (mean) to the P-3 year (mean).

<table>
<thead>
<tr>
<th>Table II. Pharmaceutical care competency (e.g., mapping courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>A2. Provide pharmaceutical care in a professional manner</td>
</tr>
<tr>
<td>A2a. Dress and speak in ways that convey a professional image</td>
</tr>
<tr>
<td>A2b. Maintain a personal self-control and professional decorum</td>
</tr>
<tr>
<td>B1. Collaborate with patients/or their care givers, physicians and/or other professionals.</td>
</tr>
<tr>
<td>B2. Collect accurate and comprehensive baseline information to create a patient-specific information base.</td>
</tr>
<tr>
<td>B3. Use basic knowledge to formulate patient care plans and respond to patient requests.</td>
</tr>
<tr>
<td>B3a. Understanding the pathogenesis, natural history and etiology, pathophysiology, epidemiology, risk factors, signs and symptoms, and clinical course of specific diseases</td>
</tr>
<tr>
<td>C3. Evaluate laboratory test results and pharmacokinetic data</td>
</tr>
<tr>
<td>Total (mean)</td>
</tr>
</tbody>
</table>

N P-1 P-2 P-3 P-3 change

4 4 3 11 1.64 3.31 3.68 2.04
4 4 3 11 2.28 3.36 3.82 1.54
4 3292 .2 1 3 .2 3 3 .7 6 1 .5 5
4 2063 .6 3 4 .1 6 4 .3 1 0 .6 8
3 3062 .3 6 3 .5 2 4 .0 7 1 .7 1

Improvement from P-1 year (mean) to the P-3 year (mean).
are free to use other mechanisms such as student focus groups to accomplish the same purpose. The College also provides an Examination Evaluation Form so that instructors can receive feedback on their examinations. In addition to student self-assessments, faculty members are required to submit annual self-assessments for each of their courses, which is a general assessment concerning the management of the course and any proposed changes in delivery and/or content.

Course and instructor evaluations are required assessments administered at the end of each semester. While a considerable amount of time is spent collecting all this information, its use is crucial to develop and maintain the curriculum. Once tabulated, copies are sent to the instructor and to the Departmental Chair. At the UNCP, teaching evaluations are tied to merit salary increases, so teaching evaluations are reviewed at the faculty members' annual performance reviews. During the reviews, positive and negative aspects of the evaluation summaries are reviewed, and goals to improve teaching performance are recommended.

2000 AACP Assessment Institute Impact. The authors attended the "2000 AACP Institute: A Guide to Program Assessment: Developing a Plan" (13). Informational sessions and feedback at the AACP Institute combined with meetings before and during the Institute lead to the development of an Educational Assessment Plan (Appendix C). The EOC is in the process of implementing the Plan. For example, the EOC is developing performance-based assessments for the first three years of the curriculum and for the clerkship curriculum. The Early Practice Experience Program is a new component of the curriculum, and the Advanced Experiential Program (clerkship) has been substantially revised, necessitating the need to develop assessment instruments to effectively measure the students' progression from basic to intermediate to advanced ability and competency levels. The EOC is also addressing methods of assessing recent graduates regarding their preparation for practice, and assessments to be completed by employers, residency directors, etc., regarding the preparation of UNCP graduates for practice.

The EOC will be using the Astin Model of assessment, the input-environment-outcome (I-E-O) model in the development of the educational outcomes assessment process (4,14,15). Input variables will be personal qualities that each student brings to the program at admission and reflects the characteristics or talent level at baseline. Environmental variables will be experiences the students receive during the educational program. This is the educational process that each student goes through, and what the educator controls and manipulates to develop the students' abilities and competencies to achieve the stated outcomes. Outcome variables will be the abilities and competencies that are desired in the students as products of the environment/educational program. Some outcomes to be measured are graduation rate, board examination scores and passing rate, alumni satisfaction survey results, and quality of job offerings. The I-E-O model has been adapted to show components of the Plan (Appendix D).

SUMMARY

Through the educational reform process, the University of Nebraska professional pharmacy curriculum has become outcomes-based with appropriate assessment measures in place and/or under development. The shift toward a student-centered curriculum, with students having more responsibility for learning, is a work in progress. The complete change from the traditional teaching and learning processes will require nurturing and additional time to develop and implement.

Faculty and student assessments that have been discussed address the teaching and learning processes. The faculty use feedback obtained from the curriculum mapping process to improve instruction and student learning. As part of the CQI process, instruments are reviewed and amended by the EOC. Additional instruments to assess educational outcomes are currently being developed by the EOC.

Assessment of a professional pharmacy curriculum is a continuous activity that all colleges and schools of pharmacy must address. The process reported herein describes the process used at the UNCP and may be of assistance to those colleges/schools that are developing or reforming their professional curriculum.

References


APPENDIX A. 2000-2001 COURSE OF STUDY

UNMC COLLEGE OF PHARMACY
PHARMD PROGRAM (approved 8-16-2000)

FIRST YEAR (P1) Class of 2004
1st Semester (18 credits)
BIOC 512 Basic Biochemistry 3
CBA 552 Human Anatomy 5
PHYS 306 Physiology 6
PHSC 550 Introduction to Pharmacy 3
PHPR 554 Professional Development 1

2nd Semester (18 credits)
BIOC 514 Applied Biochemistry 2
PAMM 509 Immunology 2
PAMM 550 Microbiology 3
MTEC 552 Microbiology Lab 1
PHPR 552 Pharmaceutical Care Lect/Lab 2
PHPR 560 Pharmacy and Health Care 3
PHSC 570 Pharmaceutical Sciences I Lect/Lab 5

SECOND YEAR (P-2) Class of 2003
3rd Semester (19 credits)
PAMM 690 Biology of Disease 5
PHAR 680 Pharmacology I 5
PHSC 626 Medicinal Chemistry I 3
PHSC 670 Pharmaceutical Sciences II 3
General Electives 3

4th Semester (19 credits)
PHAR 682 Pharmacology II 4
PHPR 684 Pharmacotherapy I 9
PHSC 628 Medicinal Chemistry II 3
PHSC 672 Pharmaceutical Sciences III 3

THIRD YEAR (P-3) Class of 2002
5th Semester (19 credits)
PHPR 662 Pharmacy Practice Management 3
PHPR 660 Legal and Ethical Principles 4
PHPR 686 Pharmacotherapy II 9
Professional Electives 3

6th Semester (19 credits)
PHPR 660 Legal and Ethical Principles 4
PHPR 686 Pharmacotherapy II 9
Professional Electives 7

FOURTH YEAR (P-4) Class of 2001
40 Weeks of Required and Selective Clerkships = 40 Sem Hours
General Elective Hours 10
Professional Elective Hours 10
Total Elective Hours 20

Requirements for Graduation:
First Three Years 112
Senior Clerkships 40
Pre-Pharmacy 60
Total Semester Hours 212

APPENDIX B. PROFESSIONAL COMPETENCIES AND ABILITIES (ABBREVIATED LIST)

The general abilities and professional competencies that guide curriculum development are given below and are shown in detail. The specific abilities and competencies that are addressed in each course are provided in the individual course syllabi.

General Abilities
I. Thinking Abilities:
The student shall find, understand, analyze, evaluate and synthesize information, and shall make informed, rational, responsible and ethical decisions.
II. Communication Abilities:
The student shall read, write, speak, listen and use data, media and computer technology to effectively send and respond to communications for varied audiences and purposes. The student shall use each of these forms of communication to improve their understanding of what they are responsible for learning. Development and enhancement of communication skills must be integrated throughout the curriculum.
III. Responsible Use of Values and Ethical Principles:
The student shall recognize different value systems while holding strongly to his/her own ethical principles. The student shall recognize the moral dimensions of his/her decisions and accept responsibility for the consequences of his/her actions.

Professional Competencies
I. Provide Pharmaceutical Care to Individual Patients:
Conduct direct patient-care activities using a consistent approach that reflects the philosophy of pharmaceutical care. These activities must be performed at a level of quality that optimizes patient health and well-being.
II. Participate in and Manage Medication Distribution and Control Systems:
IV. Social Awareness and Social Responsibility:
The student shall demonstrate a basic understanding of the strengths and problems of cultural diversity and explain how social, cultural, historical, economic, political and/or scientific issues impact upon a health care situation.
V. Self-Learning Abilities and Habits:
The student shall effectively self-assess and satisfy learning needs on an ongoing basis.
VI. Social Interaction and Citizenship:
The student shall demonstrate effective interpersonal and intergroup behaviors in a variety of situations; will elicit the views of others and seek appropriate conclusions; know how to get things done in committees, team projects and other group efforts; develop leadership abilities; display an empathetic, caring approach in personal interactions.
VII. Accepts personal responsibility and accountability for one's actions.
VIII. Acts in a manner displaying self-confidence.
Function effectively in medication distribution and control systems. Identify and use expert resources needed to develop, implement or improve medication distribution and control systems.

III. Manage the Pharmacy:
Practice pharmacy management using principles and skills that are needed to function effectively in a competitive, rapidly changing health care and business environment.

IV. Manage Medication Use Systems:
Participate in management of medication use systems using both individual patient and population-based approaches to practice.

V. Promote Public Health:
Conduct pharmaceutical care activities that promote public awareness and understanding of health and disease prevention.

VI. Provide Drug Information:
Efficiently and effectively respond to drug information requests from patients and health care practitioners.

VII. Outcomes Management:
Use individual patient and population-based outcome data to make optimal decisions in the design and development of drug therapy protocols and guidelines, and for individual patient drug therapy management.

VIII. Provide Education on Pharmacy and Health-related Topics:
Develop oral and written educational materials, and present pharmacy and health-related topics to patients, health-care providers, and the general public.

APPENDIX C. PROFESSIONAL PROGRAM OUTCOMES ASSESSMENT 2000-01 COMMITTEE'S PLAN

I. Review and revise Professional Program Abilities and Competencies Guide

II. Programmatic Curriculum Outcomes Assessment
A. Assessments
   • Definitions (e.g., longitudinal, performance-based, etc.)
   • Performance-based – first three years of the curriculum
   • Performance-based – experiential/clerkship curriculum
   • Early Practice Experience and Advanced Experiential Programs (with a progression from basic to intermediate to advanced ability and competency levels)
   • Plan Design (Miller's Taxonomy – "Knows, knows how, shows how, does")

   B. Methods
   • Astin I-E-O Model
   • Identify who will be surveyed (e.g., pharmacy associations, alumni, residency/fellowship directors, employers, industry)
   • Mechanisms
     • Types of survey instruments (mail, telephone, internet)
     • Types of performance-based assessments
       • Milestone examinations
       • OSCE
       • Capstone courses
   • Timelines
   • Survey design and validation
     • Student performance assessment
     • Faculty Assessment
     • Self-Assessment
     • Peer Assessment
     • Faculty performance assessment
     • Self-Assessment
     • Student Assessment
     • Peer Assessment
     • Program outcomes assessment
     • Develop assessment databases (e.g., longitudinal)
     • Identify process(es) to address remediation

III. Benchmarking
A. Definition
B. Identify and establish curriculum standards
   • NAPLEX (including link to competencies)
   • BPS Certification
   • DSM Certificates
   • Peer program comparisons

IV. Continuous Quality Improvement
A. Develop the Program
   • Student learning and performance
   • Curriculum
B. Communication plan/strategies
C. Implement Program

APPENDIX D. ASTIN'S (IEO) MODEL OF UMCP ASSESSMENT PLAN

INPUTS
Grade Point Average
Prerequisites
Preparation (e.g., educational background characteristics)
Interview
   Verbal and written communication abilities

ENVIRONMENT
Orientation
Professional abilities and competencies
Student assessment
Curriculum sequence/instructional methods
   Required courses
   Elective courses
   Early Practice Experience
   Advanced Experiential Program
Student professional organizations
Misc.: financial aid, employment status, marital status, extracurricular activities, etc.

SOURCE(S) OF DATA
Admissions Committee
Academic Affairs Office
Curriculum Committee
   Student self-assessment surveys
   Faculty advisor assessment form
   Preceptor assessment form
Curriculum Committee
   Course evaluation form
   Instructor evaluation form
   Fast feedback student form-lecture/course section
   Examination assessment form
Dean's Student Advisory Committee/faculty advisors/memberships/ community service/awards/reputation
   Academic Affairs Office/faculty advisors
OUTCOMES
Progression
(Learning assurance, remediation, etc.)
Achievement of College Outcomes

Quality of educational program

Reputation of College (compared to Peer Institutions)

SOURCE(S) OF DATA
Academic Performance and Standards Committee
Board passing rates
Grading Standards
Faculty Advisors
Preceptor evaluations
Annual student performance assessment
Benchmarks
Student self-assessment surveys
Dean's Student Advisory Committee
Alumni/preceptor/employer surveys
Board passing rates
Number of students completing residencies, fellowships, graduate school, specialty certification
Number of students entering practice and quality of job offerings