MEETING ABSTRACTS

108TH Annual Meeting of the American Association of Colleges of Pharmacy, Orlando, Florida, July 14-17, 2007

BIOLOGICAL SCIENCES
Completed Research

A Self-assessment Virtual Simulation Tool for Improved Clinical Pharmacology Decision-making Skills in Pre-pharmacy Students. David M. Segal, University of Central Florida; Richard L. Fernandez, Albito & Fernandez PA. Objective: This study investigated the use of computer simulated case-based training on students’ reflective decisions in clinical pharmacology scenarios. Simulated pharmacology cases present the patient history, symptoms, clinical findings, and diagnostic results. The objective is to decide on the most likely differential diagnoses and best medications to administer. The selected medications and patient outcome is automatically scored allowing for self-assessment. Hypotheses: (1) simulated case-based training results in improved pharmacology decisions outcomes; (2) simulated pharmacology decision outcomes correlate with improved pres- vs post-examination and subtest question scores; (3) simulated pharmacology cases are more realistic than traditional written scenarios; (4) simulated pharmacology case outcomes improve with reflective thinking. Methods: Simulated pharmacology cases were presented in three modalities: written, online, and virtual character simulations. Both online and paper class sections were assessed in this study. Students were given pre- and post- engagement examinations and embedded subtest questions. The students’ experience with the tool was surveyed using a 5 point scale for perceived validity and level of engagement. Results: Drug case proficiencies showed a significant improvement in the online (19%) and virtual case-simulated modalities (31%) versus conventional written case scenarios. Only the online and virtual cases showed significantly improved reflective learning outcomes with multiple reiterations of the case. The online and virtual simulations were perceived to be more realistic with the highest level of student engagement as indicated by prolonged case study times. Implications: The use of self-assessment computer-simulation tools allow the students to improve their reflective individual and group decision-making clinical pharmacology skills.

Antiapoptotic and Antinecrotic Properties of Bioflavonoids Curcumin and Rutin. Daniel Zinkovsky, Long Island University; Elida Bulku, Long Island University; Jasmine Rathod, Long Island University; Ismail Syed, Long Island University; Mayur Parmar, Long Island University; Sidhartha D. Ray, Long Island University. The last segment of the 20th century primarily focused on understanding the mechanisms of programmed cell death as opposed to unprogrammed cell death, whereas the beginning of the 21st century is more-or-less involved in defining ways to maneuver programmed cell death in order to understand disease sequel. In this arena, phytochemicals appear to play an instrumental role in modulating various forms of cell death. Among thousands of phytochemicals investigated so far, the citrus flavonoid rutin (RUT) and Curcuma longa flavonoid curcumin (CUR) have captured the most attention due to their remarkable anticancer properties. Although curcumin has already gone into anticancer clinical trial, antitoxic properties of either CUR or RUT remain unknown to date. This study explored whether pre-exposure to CUR (17 mg/kg, p.o. for 12 days) and RUT (1.25 mg/kg orally for 14 days) has the potential to prevent acetaminophen (AP)-induced liver injury and apoptotic and necrotic cell deaths in vivo. Additional objectives were to determine whether exposure to these flavonoids modulates the expression of the anti-apoptotic gene bcl-XL, by influencing oxidative stress and genomic DNA fragmentation - the prime suspects responsible for turning on various forms of cell death. Male ICR mice were administered either CUR or RUT for 12 or 14 days followed by a highly hepatotoxic dose of AP (400 mg/kg, i.p.) for 24 hours. Serum and liver samples were collected and subjected to various analyses. The results indicated that CUR and RUT pre-exposures showed dramatic prevention against AP-induced liver injury by minimizing toxicant-induced oxidative stress and genomic DNA fragmentation which are instrumental in orchestrating apoptotic (programmed) and necrotic (unprogrammed) cell deaths in the liver. Western blot analysis disclosed the ability of CUR and RUT to block AP-induced decrease in bcl-XL expression. Overall, this study suggests that pre-exposure to CUR and RUT may prevent drug/chemical-induced organ injuries.

Evaluating Pharmacy Students’ Preferences for Delivery Methods of Course Evaluations. David F. Maize, University of the Incarnate Word. Introduction: The delivery method for course evaluations is an important factor in achieving a high student response rate. Paper surveys, Blackboard surveys and SurveyMonkey.com® were investigated to determine which method was preferred by the students and provided the most convenient format for analysis and dissemination of the results to faculty. Methods: Throughout the semester, students received course evaluations either by paper, Blackboard or SurveyMonkey.com®. The course evaluation questions were identical except for the method of delivery. At the end of the fall semester, students received an online survey about the different delivery methods. The response rate was 100%. Descriptive statistics were analyzed using SPSS software. Results: Ninety-five percent of students felt course evaluations were important or very important to complete. Students completed the evaluations because they felt it was their duty/responsibility (30%), and they wanted their opinions heard (39%). The students preferred SurveyMonkey.com® (89-93%) as the method for completing course evaluations, compared to Blackboard (0-2%) and paper evaluations (2-5%). They disliked these other evaluations because of the time to complete them and concerns about their anonymity. Conclusions: It is encouraging that the pharmacy students take course evaluations seriously. To increase response rates, schools should cultivate the sense of responsibility for completing the evaluations and reinforce the anonymity of the students. The students preferred SurveyMonkey.com® because of its speed, ease of use and ability to accept more comments with greater anonymity. Additionally, data from SurveyMonkey.com® was easy to analyze and could be quickly returned to the faculty.

Nervous System Role-playing Workshop as Part of a Human Physiology Course. Edward Fisher, Midwestern University-Glen- dale. Objectives: To enhance and reinforce in first year pharmacy students the understanding of the principles of electrical conductance, neurotransmission, and the synaptic release and inactivation of neurotransmitters. Methods: After attending lectures on the topic, students
Mental illness. Perceptions of Benefit of Pharmacist-counseling for Patients with Presentations by Neuropsychiatric Patients Increase Students' and the effect of disease states (e.g. Alzheimer's disease, Parkinson's disease, and schizophrenia) on visualization and the active nature of this type of workshop allows for Many students process information to a greater extent by means of Implications: Many students process information to a greater extent by means of visualization and the active nature of this type of workshop allows for this modality of learning. Role-playing workshops could be used for various physiological and pharmacological applications. Examples include: signal transduction, central nervous system conduction, and the effect of disease states (e.g. Alzheimer’s disease, Parkinson’s disease, and schizophrenia) on conduction.

Presentations by Neuropsychiatric Patients Increase Students' Perceptions of Benefit of Pharmacist-counseling for Patients with Mental-Illness. Amber V. Buhler, Pacific University; Reza M. Karimi, Pacific University. Objectives: Pharmacists are less interactive and less comfortable providing pharmaceutical services and counseling to mentally-ill patients than to patients with classically “somatic” illnesses. Reasons why pharmacists may have lessened interaction with mentally-ill patients have been proposed to include: 1) high social-distance from those with mental-illness, and poor understanding of 2) the causes of illness, 3) the behavior of patients, and 4) the efficacy of psychiatric medication and drug counseling. To address these impediments, we have designed an innovative curriculum that includes presentations on the realities of life with mental-illness given by patients, family members, and clinicians, in addition to the traditional education on biological causes. Methods: A Likert-scale questionnaire was used to measure the attitudes and beliefs of first-year pharmacy students before and after our neuropsychiatry section. Specifically, we measured change in responses to questions measuring the previously described factors (1-4) as they pertain to both schizophrenia and clinical depression. Results: The mean on the pre-workshop quiz was 76.25%, the mean on the post-workshop quiz was a significantly higher 90.00% (p < 0.0001). The subjective data collected showed that the students favorably evaluated the workshop. Implications: Many students process information to a greater extent by means of visualization and the active nature of this type of workshop allows for this modality of learning. Role-playing workshops could be used for various physiological and pharmacological applications. Examples include: signal transduction, central nervous system conduction, and the effect of disease states (e.g. Alzheimer’s disease, Parkinson’s disease, and schizophrenia) on conduction.

Theoretical Models

Lessons Learned Using an Audience Response System in an Integrated Pharmacology, Chemistry, Therapeutics Course. R. Francis Schlemmer, University of Illinois at Chicago; Mark E. Schneiderhan, University of Illinois at Chicago; Norman L. Katz, University of Illinois at Chicago; Matthias Lu, University of Illinois at Chicago. Over the past two years, an Audience Response System (ARS) has been used to facilitate active learning in two modules of an integrated principles of drug action and therapeutics course. The modules - psychiatric and analgesic drugs - comprise a one semester course delivered as two 1-hour lectures and a recitation to second year pharmacy students. Classes of approximately 160 students were divided into two recitation sections per week. The ARS consisted of keypads and software to display polling results on projected slides. Faculty used the ARS in several formats including case study problem-solving, pretest/posttest, game show format and exam reviews. During the second year, groups alternated between using and not using the ARS in problem-solving of case studies followed by written quizzes for 10 recitations. Instructors found the ARS relatively easy to incorporate into their lessons. Most students liked using the ARS. Our experience suggests that successful ARS sessions are dependent on several factors including: 1) a well planned session, 2) properly focused questions and response choices to illustrate specific points, and 3) acquired skill of the instructor to integrate the polling questions into the flow of the lesson. A disadvantage is that the polling format extends the time required to complete a lesson. A key question yet to be answered is if the ARS enhances learning compared to the traditional recitation format. Current plans are to develop more innovative ARS techniques to enhance engagement in learning.

Work in Progress

Development of an Immunology Laboratory Course for First-year Pharmacy Students. Michelle L. Herdman, University of Charleston; Dennis K. Flaherty, University of Charleston; Ronaldo V. Ramirez, University of Charleston. Objectives: To develop an Immunology Laboratory course, which is unique to a pharmacy curriculum. Methods: Development of the laboratory presented a unique set of challenges. Since the school is new, preparation time and equipment were limited the first year, and because the course is unique, there was no template or textbook for guidance. Each of these factors influenced the development of the course. Laboratory exercises relevant to retail or hospital pharmacists and pharmaceutical research were developed and implemented. Results: Each lab session addressed topics and experiments with an immunological basis, while staying focused on one of the three areas of emphasis. In the area of retail pharmacy, laboratory exercises focused on concepts, methodology and performance of over-the-counter testing, including home pregnancy and home drug tests. The students also studied the package inserts, in order to better answer patient questions. Similarly, the area of hospital pharmacy encompassed hospital laboratory testing and ABO testing. Advanced research techniques such as flow cytometry, hybridoma, and monoclonal antibody production were demonstrated. In addition, students used monoclonal antibodies in the performance of ELISA assays. Implications: The course instructors received an Innovations in Teaching grant from WV-INBRE to add immunofluorescence and electrophoresis techniques as part of the core laboratory exercises. The plan is for this course to continually evolve over time to incorporate new assays and information to benefit future pharmacists in their careers.

Pharmacogenomics in Advanced Pharmacy Experiences. Martin M. Zdanowicz, South University; Sally A. Huston, South University; James W. Fetterman, South University. Objectives: The current study is designed to evaluate the extent to which pharmacogenomics (PG) impacts the practice of pharmacy in various Advanced Practice Experiences. Preceptors and students will be asked to detail the extent to which they encounter or apply PG at their current practice site, where and how they gained knowledge in PG, and the current
availability of resources to enhance and maintain their proficiency in PG. Both groups will also rate how important they believe competency in PG is to their current and future practice of pharmacy.

Methods: The survey will be sent electronically through PEMS (Pharmacy Education Management System) to all students and preceptors at Schools of Pharmacy in the Southeastern U.S. Similar surveys will be sent to preceptors and students. Participants will be given one month to complete the survey. A pre-notice e-mail and a midpoint reminder e-mail will be sent. Results: The study is in process; data are expected within the next few months. Implications: This study is a follow-up to a previously published study examining the content, presentation and importance of PG content in the Pharm.D. curricula of U.S. and Canadian Schools of Pharmacy. Data from the current study will provide important information related to current use of PG in practice, depth of student and preceptor knowledge in PG, and the anticipated growth and significance of PG for pharmacy practice. It will also provide guidance to academicians planning PG curricula.

Pharmacy Student Participation in a Research Program. Teresa M. Seefeldt, South Dakota State; Chandradhar Dwivedi, South Dakota State University; Gareth E. Davies, South Dakota State University; Hesham T. Fahmy, South Dakota State University; Xiangming Guan, South Dakota State University; Marek Malecki, South Dakota State University; Srinath Palakurthi, South Dakota State University; Omathamu P. Perumal, South Dakota State University; Joel E. Houglum, South Dakota State University; Brian L. Kaatz, South Dakota State University. Objective: The purpose of this presentation is to describe the pharmacy student participation and activities conducted in the pharmaceutical sciences research program at South Dakota State University. Methods: Pre-pharmacy and professional program students have the opportunity to participate in a research program within the College of Pharmacy. The faculty involved in this program have used several methods of recruiting students including the implementation of a Research Awareness Day, collaboration with student organizations, and a presentation in an introductory pharmacy course. In addition to participation in individual research projects, the program includes a journal club and discussion groups. The college also sponsors a research poster session annually with a keynote address by a motivational speaker in the area of pharmaceutical research. The program is designed to facilitate the interactions of the pre-pharmacy and professional program students, graduate students, and faculty as well as stimulate interest in graduate education and research leading to academic careers. Results: Student participation in this research program is high, and interest in the program continues to grow. Publications and presentations have resulted from these research projects. The overall impact of this program on the students as well as the college will be presented. Implications: This research program has been very successful and has had a significant impact on the participating students as well as the College of Pharmacy.

Reverse Testing, A Novel Assessment Tool to Directly Measure Students Learning. Reza M. Karimi, Pacific University; Fariba Safaiyan, Lake Erie College of Osteopathic Medicine; Amber V. Buhler, Pacific University; Michael Lee, Pacific University. Objectives: Monitoring student learning is an essential, but challenging, component of students’ achievement and effective instruction. In utilizing a reverse testing tool we were able to directly measure student learning in the classroom and to modify and adjust instructional methodologies. Methods: Over a period of two academic years, twenty tests were administered, producing a total of over seven hundred responses. Both multiple choice and essay questions were administered in those tests. Three basic science courses involved in this study were: Pharmaceutics, Biochemistry, and Pharmacology. The tests were given twice during the day: during the first few minutes of the class start (pre-teaching test) and prior to the class end (post-teaching test). Results: Our initial results from the Pharmaceutics course indicate that this tool reinforces students’ attention and stimulates their interest during lecture presentations. Significant (p < 0.05; Student’s t-test) student learning occurs between pre- and post-teaching tests. These results are consistently seen in each of the three subject areas examined thus far. Implications: The reverse testing assessment tool provides not only a methodology to directly measure, stimulate, and facilitate student learning, but also an instructional tool to promote pedagogical improvements.

CHEMISTRY

Completed Research

Assessing Streaming and Mobile Class Recordings in a Medicinal Agents Course Delivered on Two Campuses. Robert A. Fecik, University of Minnesota; Richard W. Brown, University of Minnesota; Kristin K. Janke, University of Minnesota. Objective: To investigate student preferences and perceived learning advantages/disadvantages for three methods of delivering recorded lectures. Methods: Fifteen (15) students, five (5) on one campus and ten (10) on another, volunteered to participate. Three groups of five students each were allocated to a technology (i.e. streaming video, mobile audio or mobile video) for one month. A joint focus group, involving all three technology groups, discussed the pros and cons of each technology, problems encountered when used, preferences and perceived learning advantages. This process was repeated three times, with each group testing each technology and providing feedback. Results: Students preferred mobile video (12), mobile audio (2) and streaming video (1). Students reported making notes to “re-watch” difficult lecture areas and having better attention (less distractions) with recorded lectures. Students also stated that the recordings allowed the viewer to “back off the details” and attempt to see the bigger picture. Students cautioned that recorded lectures may result in diminished attention during live lectures and were not a substitute for access to the professor. For mobile audio and video, students valued the opportunity to find the ideal study environment. For mobile video, students used the video window to quickly find sections of the lecture and to review slides, although handouts were often used to decipher structures. Students appreciated that the technology was available equally to students on both campuses. Implications: The opportunity to re-review lectures has several learning advantages valued by students. In addition, mobile learning can create study flexibility.

Theoretical Models

Explaining Important Concepts in Pharmacology Using Computer Animations. Jeffrey P. Bratberg, University of Rhode Island; Nelson M. Caetano, University of Rhode Island. Objective: Utilize three-dimensional (3D) and two-dimensional (2D) computer-and internet-based animations to facilitate the comprehension of basic pharmacology among health professional students. Methods: A pharmacy student with expertise in pharmacology, developed 3D and 2D animations as a major project over the course of one five-week long academic advanced practice experience. The animations were based on important concepts selected from a course outline belonging to an introductory pharmacology course for medical students. The topics covered by the animations included pharmacodynamic
examples such as the mechanism of a G-coupled protein receptor (signal transduction), and the effect of agonists, partial agonists, negative ago-
nists, competitive antagonists, and non-competitive antagonists on cel-
lar response. Basic pharmacokinetic examples included the major
factors affecting drug distribution including organ perfusion, protein
binding, molecular size, and lipophilicity, as well as the effects of pH
on drug absorption of weak acids and bases. These animations were
featured in several introductory pharmacology lectures required as part
of an entirely new medical school curriculum in January and February
2007. Results: 120 first-year medical students, 90% self-identified as
“visual learners,” averaged 85% on an exam that assessed conceptual
knowledge of basic pharmacology after taking this introductory course.
Implications: Medical students and other health professional students
with no prior pharmaceutical exposure may find some introductory
pharmacological concepts difficult to grasp. This generation of visual
learners may explore and apply concepts more deeply if presented in
ways familiar to their learning style.

Work in Progress

Chemical Models of Protein Structure in Drug Design. Wade A.
Russu, University of the Pacific; Hassan Shallal, University of the Pa-
fic. Objectives: To develop a chemical model of alpha-helix
structure that can withstand substitution of key amino acids necessary
for binding to its natural molecular target, and can be used to derive
meaningful structure activity relationships to identify amino acid side
chains (both natural and non-natural) that bind tighter, to the target,
and would not be identified as such in a non-reinforced helix due to
conformational entropy concerns. We have chosen as our target the
protein - protein interaction between the antiapoptotic protein Bel-2
and the proapoptotic protein Bak. Methods: We designed an initial
set of peptides based on the 16 amino acid Bak BH3 domain sequence
that each included two Aib residues. The initial set of designed pep-
tides was limited to peptides where Aib has been substituted for
residues known to be destabilizing to helix formation (glycine). Sol-
lution structure in water was assessed by CD spectropolarimetry and
bioactivity by a MTS based cell proliferation assay. Results: CD data
were collected in water with no added trifluoroethanol at room tem-
perature. Under these conditions the overall helicities of all of the
peptides was weak. However, one peptide showed significantly en-
hanced helicity compared to the native Bak (130%). We assessed the
peptides effect on cell proliferation in a MTS based assay. From these
data it appears that the designed peptides are better at decreasing cell
proliferation than the native Bak. Implications: Chemical models
which seek to constrain or preorganize a peptide have the potential
to lead to the identification of new drug candidates.

Impact of the First Professional Year Curriculum on Learning
and Lecturing Preferences. Robin M. Zavod, Midwestern Univer-
sity – Chicago; David P. Zgarrick, Midwestern University – Chicago;
Phuong Duong, Midwestern University - Chicago. Objectives: De-
termine the extent to which learning and lecturing preferences of
a student cohort change as the students experience the didactic por-
tion of a professional pharmacy program. Methods: A survey that
evaluated learning and lecturing preferences was administered to an
incoming class of pharmacy students within the first week of their
pharmacy program. The survey assessed student preferences for lec-
ture type, presentation and assessment styles. Student preferences for
learning activities, including non-lecture based classroom activities
and avenues to receive additional assistance were also assessed. The
survey will be re-administered to the same cohort at the end of their
first professional year. Results: Descriptive statistics were computed
to provide baseline information about the cohort. Practice problems
and lectures were preferred learning activities. Active and passive
lecturing were equally desirable. Visual and kinetic learning methods
were favored. Multiple choice and short answer exam questions were
perceived as the best assessment methods. “Other students” were
preferred as a source of additional assistance. Office visits and e-mail
were favored mechanisms to get questions answered outside the
classroom. Data collected at the end of the first professional year will
be compared to the baseline data to identify changes that may have
occurred over the year. Implications: Awareness of student learning
and lecturing preferences, including how these preferences may
change once the students are enrolled in a professional program,
permits the faculty to better tailor course activities in an effort to
enhance student learning.

International Pharmacy Educational and Research Relation-
ships: Past and Future for AACP Members. Bruce L. Currie, Loma
Linda University; Rosalie Sagraves, University of Illinois at Chicago;
Joseph O. Dean, Jr., Samford University. Background: A 2001 sur-
vey of international relationships of US colleges/schools of pharmacy
provided data that illustrated the extensive involvement of individual
faculty members and colleges/schools of pharmacy with educational
institutions and individual pharmacy faculty in a variety of countries
that extended from Argentina to Vietnam. Methods: An updated
version of the 2001 survey is being completed by representatives of
US colleges/schools of pharmacy. The most recent data will be ana-
lyzed, compared with the results of the previous survey, and pre-
sented. Results: Previous data from 65 colleges/schools of
pharmacy indicate: 26 colleges/schools with formal affiliation agree-
ments and 21 with informal relationships with international univer-
sities. Thus, wide engagement of faculty members and their
institutions in collaborations and cooperative agreements occur
internationally. Examples include hosting pharmacy students, resi-
dents, graduate students, post-doctoral fellows, and visiting scholars
from a variety of countries. Research collaborations have been
fostered among US researchers and their international col-
leagues. In addition, faculty exchange programs, visiting US faculty
presenting lectures or teaching courses, US faculty serving as phar-
macy curriculum/program consultants in various countries and speak-
ers in international pharmacy/scientific organization meetings
throughout the world were reported. Conclusions: International rela-
tionships provide many opportunities for professional growth and
scholarship. Many countries are exploring or implementing PharmD
programs and are looking to the US for relationships for PharmD and
PhD education and research to prepare future faculty members.

Personal Response System and Student Learning. Naser Z.
Alsharif, Creighton University; Jackie Hoefl, Creighton University;
Kevin Fuji, Creighton University. Objective: Describe and document
the usefulness of incorporating the Personal Response System (PRS)
in teaching a medicinal chemistry course. Design: Two sections of
a medicinal chemistry course constituting nine 50-minute lectures
each were taught by the same instructor utilizing the same set of
activities in a standardized approach with the exception of utilizing
the PRS in the second section. As part of in-class PowerPoint pre-
sentations, five-PRS multiple choice questions were carefully authored
to assess student understanding of current and prior content and to
engage the students. Students were trained in using their PRS in a
demonstration which mirrored a classroom session. Results: Class-
cumulative performance on PRS questions, performance on course
examinations and correlations between PRS performance and exami-
nation performance will be analyzed. Modifications to in-class
All eight residents strongly agreed that the program should be offered to all TLCPP residents with 8/11 residents completing the survey. An exit survey was distributed to different programs completed the TLCPP. An exit survey was distributed to different programs completed the TLCPP. The TLCPP was designed as an elective, longitudinal program that consisted of three components: monthly seminars, teaching/precepting, and development of an electronic portfolio. The monthly seminars included a resident- and a faculty development-specific topic. The teaching component included resident development and delivery of educational materials in both didactic and experiential settings. The electronic portfolio contained documentation of the resident’s activities, completed evaluation forms, and a personalized teaching philosophy. The TLCPP was designed as an elective, longitudinal program that consisted of three components: monthly seminars, teaching/precepting, and development of an electronic portfolio. The monthly seminars included a resident- and a faculty development-specific topic. The teaching component included resident development and delivery of educational materials in both didactic and experiential settings. The electronic portfolio contained documentation of the resident’s activities, completed evaluation forms, and a personalized teaching philosophy. The TLCPP was designed as an elective, longitudinal program that consisted of three components: monthly seminars, teaching/precepting, and development of an electronic portfolio. The monthly seminars included a resident- and a faculty development-specific topic. The teaching component included resident development and delivery of educational materials in both didactic and experiential settings. The electronic portfolio contained documentation of the resident’s activities, completed evaluation forms, and a personalized teaching philosophy. Results: From the interviews, it was determined that pharmacists must understand issues associated with genetic variations and drug response, the pharmacist’s role in the application of pharmacogenomics, and ethical, legal and social issues related to pharmacogenomics testing and its regulation. To facilitate the dissemination of this knowledge to practicing pharmacists, a Pharmacogenomics Course was designed. The design considers the need for: the development of a basic foundation of knowledge, participant flexibility, active learning, quality assessment methods, involvement of multiple faculty, ability to replicate the program for multiple audiences and offerings, ability to break even financially and practice relevance. Implications: Colleges of pharmacy have a unique responsibility to provide continuing education programs for practicing pharmacists in evolving disciplines, such as pharmacogenomics.

**CONTINUING PROFESSIONAL EDUCATION**

**Completed Research**

**Collaborative Development of a Teaching and Learning Certificate Pilot Program for West Michigan Pharmacy Residents.** Allison C. Bernknopf, Ferris State University; Nabila Ahmed-Sarwar, Ferris State University; Mandy R. Seiferlein, Ferris State University; Dana D. Sota, Ferris State University; Natalie Y. Paul, Ferris State University; Michelle L. Brodin, Mercy General Health Partners; Jaculine L. DeYoung, Spectrum Health - Butterworth Campus; Richard W. Dettloff, Pfizer. Objectives: The Ferris State University (FSU) College of Pharmacy TLCPP was created to provide an opportunity for pharmacy residents to gain experience in teaching and development of a teaching portfolio. The TLCPP was delivered through the collaborative efforts of residency preceptors, college faculty, and local health-system pharmacists. Methods: The TLCPP was designed as an elective, longitudinal program that consisted of three components: monthly seminars, teaching/precepting, and development of an electronic portfolio. The monthly seminars included a resident- and a faculty development-specific topic. The teaching component included resident development and delivery of educational materials in both didactic and experiential settings. The electronic portfolio contained documentation of the resident’s activities, completed evaluation forms, and a personalized teaching philosophy. Results: Eleven residents from six different programs completed the TLCPP. An exit survey was distributed to all TLCPP residents with 8/11 residents completing the survey. All eight residents strongly agreed that the program should be offered annually to all new residents at their respective institution. Additionally, all eight residents agreed or strongly agreed that the program would make him/her a better teacher/preceptor. Implications: The experience and feedback gained through resident evaluation of the TLCPP led to the development of a year-long teaching and learning certificate program. This program will focus on developing current residents as future educators and preceptors. Additionally, accreditation will be sought for this certificate program through the Accreditation Council for Pharmacy Education to help meet the ultimate goal of the program as a means of fostering life-long learning through continuing education.

**Needs Assessment for Pharmacist Education in Pharmacogenomics.** Amy L. Pittenger, University of Minnesota; Kristin K. Janke, University of Minnesota; Ijeoma A Ejim, University of Minnesota. Objective: To describe the need for pharmacist training in the area of pharmacogenomics, including the type of content needed and methods for best delivering training. Method: A literature review was conducted on the current status of pharmacogenomic therapy and research. The information gathered was then used to create a list of 11 interview questions designed to gather information on the current state of pharmacogenomics, future uses and challenges, and the educational needs of practicing pharmacists. Semi-structured interviews of approximately 30 minutes in length were conducted with five (5) faculty members at the University of Minnesota, College of Pharmacy with significant interest in the field of pharmacogenomics. The information from the interviews was then used by an expert panel of educators to design a continuing education program for pharmacists. Results: From the interviews, it was determined that pharmacists must understand issues associated with genetic variations and drug response, the pharmacist’s role in the application of pharmacogenomics, and ethical, legal and social issues related to pharmacogenomics testing and its regulation. To facilitate the dissemination of this knowledge to practicing pharmacists, a Pharmacogenomics Course was designed. The design considers the need for: the development of a basic foundation of knowledge, participant flexibility, active learning, quality assessment methods, involvement of multiple faculty, ability to replicate the program for multiple audiences and offerings, ability to break even financially and practice relevance. Implications: Colleges of pharmacy have a unique responsibility to provide continuing education programs for practicing pharmacists in evolving disciplines, such as pharmacogenomics.

**Work in Progress**

**New Master’s Degree Curriculum in Applied Natural Products - Attitudes of Current Graduates.** Lana Dvorik, Massachusetts College of Pharmacy and Health Sciences - Boston. Massachusetts College of Pharmacy and Health Sciences (MCPHS) is one of the leaders in Complementary and Alternative Medicine education for pharmacy students. Some of the undergraduate courses offered on an annual or biannual basis include Survey of Alternative/Complementary Healing Practices, Herbal Medicine, Non-Herbal Dietary Supplements and Mind-Body Medicine. Currently, there are no graduate programs in natural products in New England, and MCPHS has been working to develop a graduate curriculum in this area. The philosophy of the future program is to educate a broad range of professionals interested in developing expertise in the areas of Applied Natural Products (ANP). The courses offered in the program will include phytochemical therapies, herbs and dietary supplements, functional medicine, natural products informatics, safety of natural products, clinical statistical research, health epidemiology, an elective and a thesis. The program will be conducted in the evenings on a part-time basis. The graduates of the Doctor of Pharmacy program (class of 2006 and 2007) are surveyed at the end of the academic year to determine their attitudes toward the new graduate program, as well as to discuss factors influencing their decision to possibly enroll into the program. Some of the aspects addressed include desire to obtain a graduate degree/specialization in ANP, commitment to continue formal education upon graduation without interruption, interest in having a second graduate degree, convenience/schedule/length of the program, tuition, perception of stress of graduate school, appreciation of increased marketability/employment opportunities/career advancement, and their other expectations from the program.

**Pharmacy Security: A Survey on Pharmacists’ Perceptions and Preparedness to Handle Prescription Fraud and Pharmacy Robbery.** Carriann E. Richey, Butler University; Amy Lenell, Butler University. Objective: To evaluate the perceptions of the community pharmacist with respect to prescription fraud and pharmacy robbery as well as the preparedness to handle such situations, with the intent to assess the need for a continuing education program on this topic. Methods: A survey was sent to licensed Indiana pharmacists. The survey included pharmacists who currently practice in the community.
development concepts and approaches, we incorporated the new ACPE Methods: evaluation plans; and provides a functional planning framework for that meets the needs of the college and ACPE standards; integrates University of New Mexico D. Dominguez, University of Wisconsin Dopp, Medication Therapy Management Programming. Reflect Component of CPD: A Needs Analysis Tool for Future area, they are interested in further education on the topic of security. Those surveyed do not perceive robbery to be a major problem in their area, they are interested in further education on the topic of security.

**Reflect Component of CPD: A Needs Analysis Tool for Future Medication Therapy Management Programming.** Anna Legreid Dopp, University of Wisconsin; Jennifer R. Moulton, Iowa Pharmacy Association; Michael Rouse, Accreditation Council for Pharmacy Education; Alan L. Hanson, University of Wisconsin. **Introduction:** The American Pharmacists Association (APhA) and National Association of Chain Drug Stores (NACDS) have listed five core elements of a medication therapy management (MTM) model, i.e., (1) medication therapy review; (2) personal medication record; (3) medication action plan; (4) intervention and referral; and (5) documentation and follow-up. As part of a five-state Continuing Professional Development (CPD) pilot, pharmacist study subjects were required to complete an anonymous self-assessment survey in which they reflected upon their perceived level of competency in performing several skills. Examples include the development and implementation of medication therapy plans and documentation of patient care activities. **Methods:** Eighty-four pharmacists have completed the self-assessment to date. In general, pharmacists ranked their perceived level of competency in performing 100 separate pharmacy-related tasks using the following scale: 1) I would benefit from assistance in this area, 2) I feel comfortable in this area, or 3) I feel particularly strong in this area. Competencies relative to this abstract are in areas that pharmacists indicated they would benefit from additional assistance, specifically those which relate to the five core elements of MTM. These include: (1) the ability to collect medical and medication histories; (2) develop, implement, and evaluate medication action plans; (3) communicate strategies with patients and their other care providers; and (4) document the MTM services provided. **Conclusion:** Results of this research will provide continuing pharmacy education (CPE) providers with information similar to that of a needs analysis that will guide future content development and delivery of CPE programs.

**LIBRARIES/EDUCATIONAL RESOURCES**

**Theoretical Models**

Creating an Organizational Planning Model for a College of Pharmacy. Stefani D. Hines, The University of New Mexico; Karen D. Dominguez, The University of New Mexico; John A. Pieper, The University of New Mexico. **Objective:** To create a planning model that meets the needs of the college and ACPE standards; integrates and defines the organizational, strategic, 1-year action, and evaluation plans; and provides a functional planning framework for stakeholders. **Methods:** Using educational and organizational development concepts and approaches, we incorporated the new ACPE requirements into the larger organizational planning needs of the college. The model was successfully introduced to the faculty at our 2007 Winter Retreat. Results: The result of this process is a planning model composed of three parts: 1) an Organizational Plan consisting of the college’s mission, goals and objectives for all major areas within the college (beyond the ACPE requirements). The Organizational Plan is the foundational, guiding document that in-concept needs infrequent modification; 2) a Strategic Plan that includes specific 1-5 year “action objectives” which change over time and address the strategic elements of the Organizational Plan and 3) an Evaluation Assessment Plan that describes the specific formative and summative assessments that can be used to determine if our actions are meeting the college’s plans. **Implications:** Our integrated model is an approach for meeting the college’s planning needs and the new ACPE requirements in an efficient and engaging manner. The needs of contemporary academic pharmacy institutions require a layered planning approach to meet the complex challenges of evolving accreditation standards and limited resources.

**Tutorial for Warfarin Dosing Using Interactive Software and Virtual Patients.** Sara E. Rosenbaum, University of Rhode Island. **Objectives:** Warfarin’s narrow therapeutic range and highly variable pharmacokinetic (PK) and pharmacodynamic (PD) parameters make dose individualization essential. It was recently suggested that the difficulty associated with this process and the large number of factors known to influence dose requirements, inhibit the use of warfarin. The objective was to develop software based on virtual reality simulations to allow users to practice warfarin dose management. **Methods:** A computer module was created using the platform STELLA®. An integrated PK-PD model, based on the literature was built and used to simulate international normalized ratio (INR) data. The user interface consisted of a resource section and an anticoagulation clinic. The resource section used various forms of digital media and hyperlinks to provide information on warfarin’s clinical pharmacology and dosing guidelines. The clinic consisted of a diverse group of virtual patients, whom users were required to treat by entering daily doses (Monday through Sunday). At regular intervals the software provided INR values, clinical evaluations and the opportunity for users to make dosage adjustments. **Results:** The software successfully simulated therapeutic INRs from typical doses seen in various patients including those with reduced clearance and genetic polymorphism in CYP2C9 and the VKORC1 gene. When used in the Doctor of Pharmacy curriculum, it increased student awareness to important aspects of warfarin dose management. **Implications:** The software could be used in a variety of educational and clinical settings to reinforce the principles of warfarin dose management and provide experience with the process in a risk free environment.

**Work in Progress**

Analysis of the Outcomes of Transitioning the Third-year Professional Curriculum from a Synchronous to Asynchronous Pedagogy. Glenn Anderson, Texas Tech University Health Sciences Center; Margaret T. Weis, Texas Tech University Health Sciences Center; Patrick J. King, Texas Tech University Health Sciences Center; Summer Balcer, Texas Tech University Health Sciences Center; Kenneth L. McCall, Texas Tech University Health Sciences Center; Garry Rogers, Texas Tech University Health Sciences Center; Arthur A. Nelson, Texas Tech University Health Sciences Center. **Background:** In the 2006, the SOP revised the third-year professional curriculum. The revised pedagogy dictated that all educational content be delivered via short, asynchronous video lectures (10-20 minutes), preceded by targeted learning objectives, and followed by a formative assessment.
**Objective:** To assess the outcomes resulting from moving the SOP third-year curriculum from a traditional lecture-based delivery to an asynchronous mode of delivery. **Methods:** Final course grades for third-year professional students completing courses during Fall 2006 were collected. As a comparator group, final course grades for students completing the third-year curriculum in 2005 and 2004 were collected from archival databases. Comparisons between groups were made using multiple regression techniques with SPSS 15.0. **Results:** A total of 232 students were included in the analysis. Average course grades were 84.7% ± 6.4%, 83.7% ± 6.3%, 83.9% ± 6.1% for students completing third-year courses in Fall 2006, 2005, and 2004 respectively (p = 0.574). After accounting for confounding due to curricular changes occurring from 2004 to 2006 and due to student resident campus, regression analysis showed students taking course work during Fall 2006 achieved course averages that were 2.0% (p = 0.016) and 1.1% (p = 0.21) better than those in 2005 and 2004 respectively. **Implications:** Course outcomes during the Fall 2006 semester were not adversely affected by the change in pedagogy. However, continued vigilance is warranted with specific attention given to ensuring that equivalent outcomes occur on each SOP campus. Additionally, efforts taken to smoothly transition students to the asynchronous course delivery will likely improve student acceptance of the pedagogy and course outcomes.

**Librarian-lead Tutorial for Enhancement of Pharmacy Students Information Searching Skills in Advanced Experiential Rotations.** Mariana Lapidus, Massachusetts College of Pharmacy and Health Sciences – Boston; Maria D. Kostka-Rokosz, Massachusetts College of Pharmacy and Health Sciences – Boston; Lana Dvorkin, Massachusetts College of Pharmacy and Health Sciences - Boston. Faculty members at the Massachusetts College of Pharmacy and Health Sciences feel that pharmacy students have limited experience in literature searching even after successfully passing a required Drug Literature Evaluation course. Students’ ability to effectively utilize electronic databases in order to answer clinical questions from healthcare professionals and patients may not be at its optimal level. A team of pharmacy practice faculty in collaboration with a librarian has attempted to alleviate this problem by offering a tutorial session at the beginning of each elective Drug Information/Drug Information in Complementary and Alternative Medicine advanced experiential rotation in order to refresh and refine searching skills. Students participating in clinical rotations are graded based on their ability to utilize tertiary and secondary databases. Faculty members believe that the tutorial is an effective tool in merging students’ knowledge and ability to use resources initially presented in didactic course work and currently applied throughout practice rotations. The participating students are surveyed at the end of their rotations to determine their perceptions toward the effect of the tutorial on the following outcomes: searching efficiency, comfort level, and the ability to identify the most useful resource for a specific category of questions. Students are also asked about their literature search skills prior to the tutorial, and the usefulness of the tutorial in enhancement of recall and use of previously learned resources. Faculty members are hopeful that the survey will objectively confirm their views relative to the effectiveness of the tutorial.

**PHARMA C EUTICS**

**Completed Research**

Biophysical Measurements, Transepidermal Water Loss, and Moisture Contents of Skins from Different Snake Species. Somnath Singh, Creighton University; Charlene A. Fajardo, Creighton University. **Objectives:** To develop sheded snake skin as a model to predict percutaneous absorption of drugs and pollutants through human skin. **Methods:** Skin samples (1 cm × 1 cm) from dorsal side of head, mid, and tail from 10 species (Morelia viridis, Corallus caninus, Thelotornis capsenis oatesii, Sanzina madagascariensis, Elaphut guttata, Pituophis melanoleucus lodingi, Sanzina madagascariensis, Lampropeltis getulus, californiae, Obsolita rossalleni, Crotalus molossus, Pituophis melanoleucus lodingi) were taken and used for the determination of lipid and protein content by Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR-FTIR), rate of Trans Epidermal Water Loss (TEWL) by Tewameter®, and skin moisture content by corneometer®. **Results:** TEWL data obtained indicated significant (p < 0.05) species anatomical site variations. Skin samples from head region of Pituophis melanoleucus lodingi showed TEWL values (6.1 ± 0.2 gm-2h-1) significantly (p < 0.05) comparable to that of human with factor of difference, FOD, equal to 1.44. The FTIR and corneometer data corroborated the TEWL data (r2 > 0.90). **Implications:** Species and anatomical site variations must be taken into consideration while using snake skins for investigating percutaneous absorption of drugs and chemicals. Skin samples from the dorsal side of the head of Pituophis melanoleucus lodingi could be a model for predicting percutaneous absorption through human skin. However, permeability and ultramicroscopic studies are required to establish it as a valid model. Acknowledgments: Health Future Foundation (HFF), Creighton University for funding the project, School of Pharmacy and Health Professions for proving research financial assistance to Charlene A. Fajardo, and Jessi Krebs, Supervisor, Reptiles and Amphibians, Omaha’s Henry Doorly Zoo for generously providing snake skins.

**Evaluation of a Pilot, Multimedia, Interactive Learning Module in a Foundational Pharmacokinetics Course.** Adam M. Persky, The University of North Carolina at Chapel Hill; Larissa Schrapp, The University of North Carolina at Chapel Hill; Megan Bell, The University of North Carolina at Chapel Hill; Kimberly Eke, The University of North Carolina at Chapel Hill; Gary M. Pollack, The University of North Carolina at Chapel Hill. **Objectives:** Pharmacy education should promote higher-level learning and critical-thinking skills. However, class time often is dedicated predominantly to content delivery. This pilot project was conducted to evaluate the applicability of web-based, interactive learning modules for out-of-class content delivery. If successful, this type of module could allow redirection of class time towards higher-level learning Hepatic clearance, which is among the most challenging topics in pharmacokinetics, was selected for proof-of-concept. **Methods:** Students completed a pre-study quiz ~3 weeks before the class meeting, and were divided randomly into “class” (n = 63) and “module” (n = 53) groups. “Class” attended a typical lecture on hepatic clearance; “module” did not attend lecture, but completed the module and an online quiz. A post-quiz was used to assess potential differences in learning, and an attitudinal survey was administered to capture opinions regarding the two formats. **Results:** The “class” and “module” groups had similar median pre-study scores (4.0 v 3.0). Median quiz scores increased significantly post-study (4.0 v 6.0; 3.0 v 5.0; p < 0.01) but did not differ between groups. Students reported that the module was engaging, but not to the same extent as live instruction. **Implications:** While the module offered a similar educational experience with respect to foundational content, students preferred to have the interaction with the faculty member. These results suggest that interactive learning modules can be used effectively for content delivery, and may be a valuable tool when used as part of an integrated approach to learning that includes faculty interactions focused on higher-level learning.
Introducing Pharmacy Students to Pharmacogenomics: A Practical Approach to Modern Technology. Evgeny Y. Krynetskiy, Temple University; Ina L. Calligaro, Temple University. Objectives: The lab component was added to the didactic material of the Pharmacogenomics course (i) to introduce students to the concepts and technologies of Pharmacogenomics; (ii) to demonstrate the clinical implications of genotype as a risk factor for adverse drug reactions through the lab experience. Methods: We established a lab where the second-year Pharmacy students extracted DNA using their saliva as a starting material, evaluated DNA quality, and performed genotyping analysis of Single Nucleotide Polymorphisms by fast-throughput technology. Results: Genetic polymorphism in N-acetyltransferase (NAT2) which is a well-characterized polymorphic gene responsible for adverse reactions to isoniazid, sulfanilamide, and other drugs, was assessed in 70 DNA samples. Based on results generated during two lab sessions, the students calculated frequency of polymorphic alleles of NAT2. To protect confidentiality, genotyping analysis was blinded so that students could identify their own genotype but not genotypes of the rest of the class. During the third lab session, students performed stratification of the class into the fast, the slow, and the intermediate acetylators, and discussed clinical significance of genetic analysis in patients. Implications: Healthcare providers need to be educated about the genotype as a risk factor for adverse drug reactions. To this end, we established a robust protocol where students during three lab sessions were introduced to the major techniques and interpretation of genotyping experiments. Using the drug acetylation polymorphism as an example, this lab helped students to understand the relevance of Pharmacogenomics analysis for the rational choice of individualized medication regimens.

Participation in Leadership Activities is not Different among Students with Varying Pre-Pharmacy Years in College. Sara E. Renzi, University at Buffalo; Daniel A. Brazeau, University at Buffalo; Mark M. Sauberan, University at Buffalo; Gayle A. Brazeau, University at Buffalo. Objective: Schools/Colleges have an interest in developing and promoting student leadership. This study investigated whether entering students with varying pre-pharmacy years in college differed in their extent of involvement in pharmacy leadership positions. Methods: P1-P3 students (394) in the 2004-2007 classes were classified as either early assurance (EA), two years of college not early assurance 2Y, three or more years of college but no degree (3Y) and Bachelor’s degree or higher (BD). Students were classified as either holding any elected office or not; total number of officer positions and whether they were a member of Phi Lambda Sigma (PLS). Statistical analysis was conducted using Goodness of Fit analysis (G-tests).

Results: The percentage of students that held at least one leadership position were 27.1%, 31.9%, 26.8% and 30.2% for EA, 2Y, 3Y, and BD, respectively. EA students held a total of 71 offices compared to 45 for 2Y, 39 for 3Y, and 80 for BD students. The percentage of students who were selected for PLS was 12.1% for EA, 15.3% for 2Y, 16.1% for 3Y, and 13.5% for BD. There were no statistical differences in these leadership measures between any of the above groups and between the EA students compared to the other three groups combined. Implications: Leadership activities, as measured by the number of students with at least one office, total number of offices and membership in PLS, is independent of the number of previous years in college in this cohort of students.

TOPS Survey: Pharmaceutical Skills Laboratory. Deborah L. Strong, The University of Georgia; Catherine A. White, The University of Georgia. Objective: Determine if applied skills laboratories are important in the development of compounding skills. Methods: An on-line survey was completed by pharmacists listed as AACP members in the 2005-06 rooster. The survey consisted of 10 single choice or short response questions. Responses were collected and data compiled anonymously using the collection tool provided through the survey software. Preliminary results were presented as part of the TOPS program at the 2006 annual AACP meeting. Results: Ninety-five percent (95%) of the participants stated that the preparation of capsules, ointments, creams, suppositories, solutions, suspensions and parenteral products are included in their laboratory exercises. Seventy-five percent (75%) state they hold a recitation prior to each laboratory session. Ninety-five percent (95%) identified calculations as the most emphasized topic. Sixty-two percent (62%) stated they could not adequately access compounding skills with only written evaluations. Discussion: Applied skills laboratories are important in the development of compounding skills. Pharmaceutical skills laboratory provides an environment where students can apply knowledge and demonstrate pharmaceutical and compounding skills.

Triage Skills and Mass Casualty Management in the PharmD Curriculum. Catherine A. White, The University of Georgia; Deborah L. Strong, The University of Georgia; Cham E. Dallas, The University of Georgia; Edward A. Rollor, The University of Georgia. Objective: To evaluate two methods for assessing mass casualty triage skills. Methods: Students (N = 45) enrolled in Disaster Training for Health Care Professionals were taught mass casualty triage skills during lecture. Student learning was assessed by two methods. In the first method victims (N = 28) were moulaged to present with various injuries and assigned a script. Students rotated through the stations with 45 seconds to assess each victim. Assessment of live victims occurred at two separate times. The second method involved a computer exercise in which the injuries and behavior of the live victims were described. With each method students had to sort victims into one of four categories: Immediate, delayed, minimal, or expectant (dead/dying). Students completed a 12-question survey evaluating the two assessment methods with a section for comments. Results: 100% of the students agreed that the live victim triage exercise was a valuable learning experience. 21% of them felt the computer assessment method was equivalent to the live victim exercise. 60% of students felt that the interaction with the victims actually made the live victim exercise more difficult. 90% of the students felt more confident that they could participate in a real triage situation after completing the live victim exercises. Discussion: Students had the greatest difficulty deciding which victims belonged in the immediate vs. delayed groups in both methods but were more likely to place victims in the expectant category with the computer method. Interaction with live victims adds a level of complexity to triage and better prepares students.

Videography: A Tool for Evaluating Compounding Skills. Deborah L. Strong, The University of Georgia. Objective: To determine if videography can be used to evaluate compounding skills. Methods: Second-year Pharm D students used videography to demonstrate their compounding skills. One-hundred and twenty-six (126) students were randomized into groups of three or four. Each group produced a two to three minute audio-visual presentation demonstrating their ability to properly employ the techniques used when preparing extemporaneous products (compounding). Each group submitted a video demonstrating proper use of the prescription balances (tortion and electronic), aliquot preparation, trituration, pulverization by intervention, spatulation, geometric dilution, preparation of divide powders, capsule packing and the preparation of liquid or powder filled capsules. Each video was evaluated by two laboratory instructors using
a standard Lickert scale of 1-10, with 1 representing the worst possible rating and 10 being the best. Students completed a 10 question survey evaluating the project. **Results:** Students demonstrated compounding skills with 78.5 to 93 % proficiency, with a mean of 88.2%. They were least accurate when preparing aliquots and most accurate when demonstrating pulverization by intervention. Ninety-four percent of students agreed that good compounding skills are necessary in the practice of pharmacy. Eighty-eight percent of them felt videography was an appropriate tool for demonstrating their compounding skills. Eighty-five percent felt videography is an effective tool for evaluating their compounding skills. **Discussion:** Videography is an effective tool for assessing the strengths and weaknesses of pharmacy students. It can be utilized by laboratory instructors to evaluate and improve compounding skills when educating large groups.

**Theoretical Models**

**New Approaches to Integrating Theory With Hands-On Experience in Bachelor of Pharmaceutical Sciences Programs.** Eman Atef, Massachusetts College of Pharmacy and Health Science – Boston. **Objectives:** There is a necessity to provide the industry with qualified graduates with BS degree in Pharmaceutical Sciences (BSPS). Our objective is to come up with recommendations to make curriculums in the BSPS programs more in alliance with the needs of the industry. **Methods:** We embarked on evaluating curriculums currently used at Bachelor of Pharmaceutical Sciences programs. We have also analyzed the current needs of the pharmaceutical companies. The curriculums were evaluated according to their ability to fulfill the industry needs. **Results:** BS programs should be built on two important foundations; the first is a strong basic sciences background that will ensure the ability of the graduates from these programs to cope with the changing demands of pharmaceutical industry. The second is developing the students’ practical abilities and hands-on experiences that are based on strong understanding of the underlying theories. Another important aspect in the training of the BS students is developing their oral and scientific communication skills. **Implication:** Offering pharmaceutical professional labs, like Pharmaceutical Analysis and Industrial Pharmacy labs is very crucial in developing the students’ hands-on lab skills. Also Pharmaceutical seminar serves vital role in developing the students’ abilities to evaluate current research and do oral presentations Development of rotation programs in pharmaceutical and biotechnology companies in the future will be highly valuable for the experiential training of these students.

**Using Critical Self-Reflection and Teaching Assistants (P3 Students) to Reinforce Aseptic Technique Learning.** Kenneth R. Keeffner, Creighton University; Karen K. O’Brien, Creighton University. **Objective:** The intent of this exercise was to reinforce learning of aseptic technique (AT) skills by utilizing P3s to augment student learned skills along with critical self-reflection after completing an AT practical exercise. **Process:** P2 students take a required course in sterile products that includes an AT skills laboratory and an AT practical examination. An educational triad (1 instructor and 2-P3s) is utilized to educate and train nine-P2 students. P2 students are required to read, observe a DVD, and view a live demonstration of proper AT prior to their initial experience. The AT skills laboratory has seven AT practice activities. Once all AT labs are completed each student undergoes a practical AT evaluation. The practical is observed by an instructor, and is video-taped so the student can review his AT activity and critically self-evaluate his skills. A grading rubric is provided for instructor and student use in determining a score. **Outcomes:** Students observe and critically evaluate their own AT based upon methods taught in the laboratory, utilizing a grading rubric to assess their skill. The reflective exercise asks students to reflect, as a pharmacist, on whether their technique development is safe and acceptable. **Implications:** Students become more critical of their AT skills through self-observation and reflection. Reflective opportunities appear to build confidence, but, also contribute to student professional maturity. Student responses ranged from trying to score a high grade; honestly assessing an acceptable level of AT, and a desire to master the skill.

**Work in Progress**

**Evaluating Students’ Relevant Fundamental Knowledge Base, Practical Skills and Basic Attitudes for Basic Pharmaceutics Course.** Naushad K. Ghilzai, Lake Erie College of Osteopathic Medicine. **Objectives:** To evaluate the first year Pharm.D. Students’ responses by administering a comparative pre and post-course concepts/topics assessment survey. Each survey contains basic questions on the current and prior understanding of the new concepts/topics taught in a pharmaceutics core course. To compare with the data collected from a previous year assessment survey. **Methods:** A pre and post course assessment surveys was administered at the beginning and end of the course, respectively. Students were asked to select the most appropriate answer from the five choices, strongly agree, agree, undecided, disagree and strongly disagree. The pre-and post course assessment surveys were designed to collect the students views on the following: course content, clarity of the presentation, answer students questions effectively, availability of the instructor outside of class and the interactive classroom environment. The course content questions were focused on their understanding of course topics. The following topics form the basis of the physical pharmacy course. Some topics covered include: chemical kinetics, plotting of data on a graph paper, understanding of the acidic-basic nature of a drug and the importance of the solubility factor in pre-formulation process. **Results:** The results of each assessment surveys are evaluated. The results suggest that the students gained knowledge in all areas, particularly abundantly in previously less well-understood course concepts/topics. Survey statistics are awaited. **Implications:** The assessment survey outcome will help the course instructor in designing, preparing, planning, organizing, and delivering the course material. The comparison results of the assessment survey will enable instructor to better meet the needs of the future students. Based on the assessment survey results, the course instructor can lay down a strong foundation of the course next time.

**One Year and Three Year Postgraduation Alumni Surveys: An Assessment Tool in Pharm.D. Programs.** Corinne C. Ramaley, Hampton University; Sushma Ramsingham, Hampton University; Shay E. Phillips, Hampton University; Andrew B. Morris, Hampton University; Vera C. Campbell, Hampton University; Damien R. Fisher, Hampton University; June G. Javier, Hampton University; Toniya S. Martin, Hampton University; Susan M. Morris, Hampton University; Joanne K. Morse, Hampton University; Francis A. Ndem, Hampton University; Hugh M. McLean, Hampton University. **Objectives:** Systematic assessment of professional pharmacy programs is mandated by the accreditation standards adopted by the Accreditation Council for Pharmacy Education. At Hampton University, one year and three year postgraduation alumni surveys were developed 1) to assess alumni satisfaction with their professional education and 2) to identify areas of the program and curriculum where improvement is needed. **Methods:** Alumni completed one year

and three year postgraduate surveys to determine satisfaction with their education, including preparation for a residency; quality of instruction, curriculum, advising and career guidance; preparation for delivering pharmaceutical care; and achievement of the professional practice based outcomes. Areas needing improvement were defined as those items in the survey with a combined satisfaction rating of less than 70% in the upper two categories (very satisfied and mostly satisfied). Results: Six areas were identified for improvement: teaching how to manage a pharmacy, student advisement, quality of advanced pharmacy practice experiences (APPEs), clinical skills instruction, TPN preparation, and loan consolidation/financial planning assistance. Corrective actions were defined for each area. Implications: Positive outcomes develop from the use of alumni surveys as an assessment tool. At Hampton University, an elective will be offered in Pharmacy Management, a comprehensive advisement program has been established, additional internal faculty preceptors have been hired to teach clinical APPEs, more TPN preparation has been incorporated in the curriculum and financial planning advisors have been invited to speak at forum. The use of alumni survey data becomes a key factor in improving program quality.

PHARMACY PRACTICE
Completed Research

A Comparison of Third Year Pharmacy Students Reading Ability (NDRT) and PCAT Scores: 1 Steve H. Fuller, Campbell University; Cheryl B. Horlen, Campbell University; Robert M. Cisneros, Campbell University; Tonja N. Merz, Wingate University. Many of today’s college students may not be reading at a level needed to comprehend required reading materials. Research has shown that at least 70% of college students do not read required materials before class. The Nelson-Denny Reading Test (NDRT) is a standardized reading test that assesses a student’s ability in three areas: vocabulary, reading comprehension, and reading rate. A positive relationship has been found between the NDRT and medical students’ performance. Jackson and Brooks reported a positive correlation (r = 0.51) between MCAT reading scores and total scores from the NDRT. However, little attention has been focused on the reading skills of pharmacy students. Our study focused on determining the reading grade level of pharmacy students in their third professional year at Campbell University School of Pharmacy We compared subjects’ NDRT scores with PCAT scores and demographic variables, such as a prior undergraduate degree, primary language, and parents’ education. Our results show that although third year pharmacy students should read at an actual grade level of 18-19, their NDRT grade level scores averaged 16.5. The data revealed a correlation between the NDRT vocabulary scores and the verbal PCAT scores, (r = 0.76, p < 0.05). We will report other associations and how we believe reading assessment can be used to screen pharmacy school applicants or improve their academic performance once admitted.

A Descriptive Study of Arkansas Pharmacy Students’ Knowledge of and Attitudes toward Emergency Contraception. Denise D. Hopkins, The University of Arkansas; Donna S. West, The University of Arkansas. Objectives: The purpose of this study is to describe Arkansas pharmacy students’ knowledge, attitudes, and beliefs regarding emergency contraception (EC). Methods: A cross-sectional survey was conducted among a convenience sample of pharmacy students at a southern College of Pharmacy. The 16-item survey included multiple choice and true/false questions to assess knowledge in addition to Likert-type scale questions regarding attitudes and beliefs. Demographic information and EC dispensing experience were also collected. Frequency and descriptive statistics were calculated for all variables. Results: 301 pharmacy students completed the survey. A majority (91%) knew that Plan B had been FDA-approved for nonprescription use by females over 18; however only one-third (33.7%) knew how EC works. On a scale from 1-5 where 5 = strongly agree, the mean item score was 3.2 for whether EC should be available without a prescription and 3.2 for whether EC promoted unsafe sex. Almost half (48.6%) did not believe they were competent instructing patients on the use of EC. Approximately 18% had dispensed EC. When asked what they would do if presented with a request for EC, 42.8% indicated they would fill the prescription, 17.1% would refer the patient to another pharmacist or pharmacy, 7.0% would refuse to dispense, and 32.2% were not sure. Implications: Pharmacy students could benefit from additional training on EC and proper counseling for EC. The results of this study can help in the design of better educational programs for pharmacy students and pharmacists, given the wide range of attitudes and experiences with EC.

A MultiCenter Study of Student Grades and Evaluation Patterns in Advanced Pharmacy Practice Experiences (APPEs). W. Klugh Kennedy, The University of Georgia; Lori J. Duke, The University of Georgia; James W. Fetterson, South University; Whitney L. Unterwagner, Mercer University; Debbie C. Byrd, University of Tennessee Health Science Center; Charles H. McDuffie, The University of Georgia; Mindi S. Miller, The University of Georgia; Melody C. Sheffield, The University of Georgia; Patrick D. Brackett, Auburn University; April G. Staton, Auburn University; Sandra Rogers, The University of Georgia. Intent: To identify the presence of grade inflation in APPEs among four colleges of pharmacy using similar evaluation tools. To examine the correlation between grade assigned, comparable student rank, and suitability for employment in an entry level pharmacy position upon graduation. Process: Final student evaluation data was extracted from EMS (Education Management System), a web-based experiential documentation system, for all APPEs completed during the 2005-2006 academic year. We looked at the following: calculated grade, assigned grade, comparable student ranking, employability, APPE type, APPE timing, and instructor status. Outcomes: Of 3175 APPEs, grade distribution was the following: 85.5% A, 13.3% B, 1.1% C, 0.09% D, 0.06% F. Grades for distributive APPEs were significantly higher compared to clinical or indirect APPEs (p < 0.0001). Twenty-two percent of APPEs were taught by full-time faculty. 68.9% of grades assigned by full-time faculty were in the A range in comparison to 90% assigned by volunteer faculty. (p < 0.001) All students receiving grades of D or F were determined “non-hirable” for an entry level position. Interestingly, 78 of 2714 receiving A’s, 103 of 422 receiving B’s, and 26 of 35 receiving C’s were also determined “non-hirable” by the instructor. For students receiving A’s, student ranking was evaluated as: top 10% (55.4%) upper third (37%), middle third (7.5%), lower third (0.2%). Implications: Grade inflation is present in APPE courses. Investigation is needed to identify why students receiving A’s and B’s were perceived as non-hirable for entry level positions. Preceptor education should include criteria for accurate assessment of student performance.

Abilities Based Outcomes Data from a Pharmacy Course on Disease Prevention. Thomas L. Lenz, Creighton University. The AACP CAPE Educational Outcomes and other organizations stress the importance of teaching public health topics which include health promotion, wellness and disease prevention as part of training
future pharmacy practitioners. Objectives: Address a pedagogical deficiency in our curriculum by offering a course to students on wellness/disease prevention and to assess the knowledge, skills and attitudes of students in the course. Methods: A two credit hour elective course entitled “Lifestyle Modifications in Pharmacotherapy” was offered to pharmacy students in the fall of 2006. Students completed a series of pretests which assessed their knowledge of nutrition, physical activity, weight loss and obesity; their skills in writing a SOAP note, designing patient specific nutrition, physical activity, weight loss and smoking cessation programs; and their beliefs/confidence about disease prevention and wellness. The pretest data was then compared with the same assessments measured at the end of the semester. Results: A total of 13 (62% female, 85% P2 level) students participated in the course. Pretest vs. posttest data showed overall knowledge improved 101% (P < 0.001), skills improved 299% (P = 0.003), and combined knowledge and skills improved of 215% (P = 0.001). Attitudes regarding belief and confidence also improved from pretest to posttest by 3.2% (P = 0.06) and 78% (P < 0.001), respectively. Implications: Many organizations, including AACP, recommend pharmacy students attain information on wellness and disease prevention topics. Measuring the abilities based outcomes of these topics can ensure that students are able to most effectively care for patients who need disease prevention intervention.

An Assessment of Sleep Education in Schools of Pharmacy. Karen J. Kopacek, University of Wisconsin; Amy K. Kennedy, University of Wisconsin; Anna Legreid Dopp, University of Wisconsin; John M. Dopp, University of Wisconsin. Introduction: Sleep disorders are increasingly common, affecting 50-70 million Americans. In contrast, a 2003 National Institutes of Health position statement asserts sleep education for healthcare professionals is inadequate. Literature indicates sleep education in medical schools is lacking and no information has been published on pharmacy schools. We sought to determine the current extent of sleep education in United States (US) pharmacy schools. Methods: A national survey was conducted to assess the types and amount of training pharmacy students receive. Schools were asked to indicate the hours dedicated to sleep education, the setting and resources utilized, and the delivery format used. Results: We received 25 responses from 110 pharmacy schools (22.7%). Schools devote on average 2.7 didactic hours to sleep education. The major obstacle reported to covering sleep disorders was limited time to expand topics. Eight percent of respondents indicated that sleep education is taught by instructors with a sleep medicine practice background. Thirty-six percent of institutions offer experiential opportunities in sleep medicine; however only one is completely devoted to sleep. Conclusion: Curriculum space is tight in healthcare programs, including pharmacy schools. Our survey indicates that students receive less than three hours of class time devoted to sleep education in US pharmacy schools. As the prevalence of sleep disorders increases, strategic curriculum choices will need to be made to adequately prepare pharmacy students to effectively manage associated pharmacotherapeutic issues.

An Interactive Computer Program for the Teaching and Practice of Total Parenteral Nutrition. Tony J. Eid, Loma Linda University; Gamal Hussein, Loma Linda University. Objective: To develop a computer program that would allow students to learn and practice total parenteral nutrition (TPN). Background: Available TPN software are limited and it lacks an educational component. Design and Methods: The teaching component of the program was designed in a web-based format with a text-to-speech capability. The practice component of the program was created in Microsoft Access® 2003. Teaching modules included routes of administration, and estimation of patient needs such as fluids, calories, carbohydrates, amino acids, lipids, electrolytes, and additives. The Practice program allows students to enter patient data and laboratory values, and then to estimate, modify, and print a TPN. Students had the opportunity to change types and concentrations of a TPN admixture, and to understand how these changes can impact their patient. A Likert scale survey was completed by twenty nine pharmacy students indicated a favorable response (80%-91%) to 6 parameters that address use, educational benefits, and program performance. Conclusion: Interactive tutorials with text-to-speech capability and software can be utilized for pharmacy education and practice as well as for professional development of practicing pharmacists.

An Interdisciplinary Model for the Introduction of Students to the Care of Geriatric Patients in an Assisted Living Environment. Michele A. Poeppeing-Faulkner, Creighton University; Ann M. Ryan-Haddad, Creighton University; Kelli L. Coover, Creighton University. Objectives: To describe the development and implementation of a multidisciplinary team experience implemented to give students real life exposure to geriatric patients and the roles of other health care professionals. Methods: Second and third year pharmacy students enrolled in an elective geriatric pharmacy course were teamed with occupational therapy (OT) and physical therapy (PT) students to assess geriatric residents in assisted living facilities. Resident participation was voluntary. A pre-experience meeting was scheduled to allow students to meet their OT and PT counterparts. Medication lists were obtained prior to the live visit to give pharmacy students an opportunity to develop a preliminary set of questions for the residents they were assigned. A meet-and-greet party was scheduled prior to the clinical patient encounter to allow students and residents to learn about one another. During the assessment visit, students were able to observe the other disciplines interact with the residents. An interdisciplinary class meeting was scheduled to allow each student group to present their care plan. Results: Several barriers were encountered during the process, particularly with regard to coordination of student schedules and uneven participant numbers from the different disciplines. However, student feedback indicates the experience was positive, both from the standpoint of learning about other disciplines and gaining a better understanding of the challenges facing the geriatric patient. Implications: A real-life multidisciplinary approach can enhance pharmacy students’ understanding of their role, and the roles of other practitioners, in the care of the older patient.

Animal Assisted Therapy and its Effects on Medication Usage. W. Elaine Lust, Creighton University; Ann M. Ryan-Haddad, Creighton University; Kelli L. Coover, Creighton University. Objective: To measure changes of as needed (PRN) medication usage of three medication categories as a result of a therapy dog residing in a non-geriatric rehabilitation facility. Additionally, residents’ thoughts on quality of life factors as a result of the dog were also measured. Methods: A one group, pre-test, post-test design using a convenience sample of (N = 58) residents living at the facility who consented to the study. The intervention was a certified, trained therapy dog named “Neil”. Quantitative data collection on changes in PRN medication usage for the following categories: analgesics, psychoactive medications, and laxatives. Data was collected for 3 months pre-dog placement and 9 months post-dog placement. Qualitative data was collected using focus groups to report changes in the residents’ perception of quality of life factors due to the dog’s presence. Results: The analgesic drug category revealed a decrease in medication usage (mean = 2.6, SD ± 6.90, p = 0.017). Qualitative data revealed themes of increased level of
personal happiness, added purpose of life, an outlet for emotional release, and normalization of the environment. **Conclusion:** The benefits to human welfare due to the presence of a therapy dog have the potential to decrease medication usage for certain conditions in long-term care patients. Such outcomes can decrease medication utilization and costs, two recognized factors impacting patients in long-term care. Pharmacist involvement in AAT has the potential to make measurable improvements to best patient care and contribute to a unique form of veterinary pharmacy.

**Annual Preceptor Education Conferences: A Collaboration between the School of Pharmacy and Alumni Association.** Jane E. Krause, Purdue University; Pamela S. Ringor, Kroger Pharmacy & Purdue Pharmacy Alumni Association. **Objectives:** To develop and assess annual education conferences for advanced pharmacy practice experience preceptors at Purdue University. **Methods:** The one-half day conferences held each spring (i.e., in April) focused on topics (i.e., curriculum update, program refinements, assessment of students, quality assurance initiatives, rotation objectives, portfolios, individualizing rotations, and break-out discussion groups) associated with on-going training/education and development of preceptors. Each year, the conference was developed and coordinated through a unique collaboration and partnership between the School of Pharmacy’s Office of Experiential Education and the Purdue Pharmacy Alumni Association. Feedback regarding the education conferences was obtained each year from the participants. **Results:** Preceptor education conferences were held yearly from 1998-2004 for the preceptors involved with the advanced pharmacy practice experiences at Purdue University. Preceptor education conferences grew to be held each spring in six regions (i.e., in areas of concentrated advanced pharmacy practice experience placements) throughout Indiana. This allowed preceptors within a given region of Indiana to get to know one another and work synergistically together. A total of approximately 150 preceptors attended one of the regional education conferences each spring. The development, implementation, and evolution of the preceptor education conferences are discussed. Example conference agendas and discussion topics are described. Feedback from preceptors regarding the education conferences is presented. **Implications:** Developing preceptor education programs through partnership with the Purdue Pharmacy Alumni Association is an effective and unique collaboration. Yearly, regionalized preceptor education conferences serves as a quality assurance initiative for the experiential education program at Purdue University.

**Applicant Interviews and Interviewer Training in the Admissions Process.** Wendy C. Cox, The University of North Carolina at Chapel Hill; Carla Y. White-Harris, The University of North Carolina at Chapel Hill; Pamela U. Joyner, The University of North Carolina at Chapel Hill. **Objectives:** Applicant interviews and interviewer training are required by the new Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. However, there is little guidance on how this training should occur and what should be included. The University of North Carolina at Chapel Hill School of Pharmacy implemented interviewer training during the 2005-2006 admissions cycle. The purpose of this study was to elicit feedback and faculty interviewer opinions regarding the importance of applicant interviews and interviewer training. **Methods:** A survey was sent to all forty faculty members who participated in applicant interviews during the 2005-2006 admissions cycle. The survey consisted of nine questions aimed at gaining insight into the faculty’s perception of applicant interviews and interviewer training, and to gather feedback on how to improve the interviewer training for the next admissions cycle. **Results:** A response was received from 31 faculty members (78% response rate). The majority of faculty believed applicant interviews and interviewer training were extremely important in the admissions process. However, half of the faculty did not believe that the interviewer training provided by the School was helpful because it did not enable differentiation between desirable and undesirable applicants. **Implications:** The survey results suggest the need for improved interviewer training at the UNC School of Pharmacy. In addition, further studies are needed to evaluate the impact of applicant interviews and interviewer training in helping to identify those applicants who are most likely to be successful.

**Application and Assessment of an Oral Group Examination for Cardiovascular Therapeutics.** Mark A. Munger, The University of Utah; Franklin L. Huggins, The University of Utah; Benjamin Van Tassell, The University of Utah. The practice of using oral examinations for assessment of Ph.D. and Masters theses is commonplace in pharmacy, the oral examination has been used for pre-pharmacy admitting procedures, but has limited utility in the professional curriculum. Thereby, we assessed the practice of using oral examinations to determine student competence in cardiovascular therapeutics. **Methods:** For the past 3 years, the cardiovascular module at the Utah College of Pharmacy has utilized a group-based oral examination format. P3 students are divided into groups of 4-5. Each group is provided a single complex cardiovascular disease-related case with one hour to assess and plan treatment for the case. Each group then presents their findings over a 30-minute time-period to 2-3 professor examiners. Each student in the group is additionally asked 3 1 question, determined a priori. **Results:** The student evaluation scores were 1.28-1.34 range on a 4-point Likert scale, with 1 being excellent. Examination scores ranged from 83-97%, with therapy monitoring being the least scored area. This range matches the written examination range for 10 years prior to the oral examinations. Student comments were universally positive about their experience, after an initial anxiety period of a new type of testing procedure. The group design was noted as a positive experience. Student scores were 97.5% correlated with the examiners. **Conclusion:** An oral group examination of student competence in cardiovascular therapeutics is well accepted by students, matches scoring outcomes to written examinations, and provides students with a team approach to solving therapeutic problems, in preparation for advanced clinical practice experiences.

**Assessment of Patient Satisfaction with Clinical Pharmacy Services in a Pain Management Clinic.** Tibb F. Jacobs, The University of Louisiana at Monroe; Cynthia Henry, Louisiana State University Health Sciences Center; Candace Thibodeaux, The University of Louisiana at Monroe; Arthur Fort, Louisiana State University. **Objectives:** Evaluate patient satisfaction with clinical pharmacy services provided in the Family Medicine Pain Management Clinic (FMPAIN Clinic). **Methods:** Current services offered in the FMPAIN Clinic include pharmacy students collecting medication histories and providing follow-up counseling. A multidisciplinary team (consisting of physician, pharmacy faculty member and student) then meets with each patient to determine the most appropriate treatment option. A patient satisfaction survey was developed to assess patients’ perceptions of clinical pharmacy services in the FMPAIN Clinic. This survey was administered to each patient seen in clinic over a two month period (N = 131). 85 completed surveys (65%) were received. Patients were asked nine questions about understanding how to take their pain medications, potential side effects,
helpfulness of pharmacy students, and satisfaction with overall care. They were also asked the same questions regarding other hospital clinics. Results to the questionnaire were rated on a Likert scale (1-10). Results: Student t tests were conducted to determine statistical significance. Statistically significant differences were found in patients’ understanding of medication dosing (p = 0.475) and side effects (p = 0.0181). Significant differences were also detected in patients assessment of overall care received in the FMPAIN Clinic compared to other hospital clinics (p < 0.0001). Internal reliability was assessed using Cronbach’s alpha (α = 088465). Implications: While our institution provides extensive in-patient clinical pharmacy services, this is the first out-patient pharmacy service established. These results demonstrate that pharmacy students and faculty provide well received and much needed services. We are currently adding pharmacy faculty in other Family Medicine clinics.

Career Pathways in Pharmacy - A Student’s Search. Julie C. Kissack, Mercer University; Alexandria Fagan, Mercer University. A diverse range of career pathways in pharmacy exists but student pharmacists may not realize potential opportunities or know how to educate themselves about these options. Student initiated contact with various pharmacy organizations to lean about careers may provide differing results. Organization contact could be accomplished through hand written inquiries or by searching pharmacy organization websites. The objective of this project was to determine the types of career pathway information that pharmacy organizations provide upon student inquiry about exploring career options and level of training to obtain various careers through the organization. Methods: A student pharmacist crafted a letter stating a desire to learn more about careers in different organizations. Letters were sent to seventeen pharmacy organizations. Information about three organizations was accessed through websites only. Results: Two letters were returned as undeliverable. Seven organizations sent no response. Most responding organizations sent a letter, brochure of student services, information about website resources, magazine about Pharmacy Careers, Guide to Pharmacy Careers, or directed the student to the individual state board for further information. Student resources found at organizational websites was navigated with and without ease depending upon the organization. Implications: Students searching for information about career opportunities may meet with different levels of success in learning about pharmacy organizations student services. Faculty are a valuable resource to students seeking career opportunities and need to be knowledgeable about resources. They should be able to help direct the students toward information that is easy to access and educational about career paths in pharmacy.

Changes over Time in Pharmacy Students’ Ability to Educate on Insulin Injection Technique Using OSCEs. Jeany K. Jun, Western University of Health Sciences; Eenice P. Chung, Western University of Health Sciences; James D. Scott, Western University of Health Sciences; Donald I. Hsu, Western University of Health Sciences. Objective: To compare second and third year pharmacy students’ ability to educate patients on proper insulin injection technique and assess retention of the skills over time using an objective structured clinical examination (OSCE). Methods: The pharmacy curriculum identified core skills that all students should acquire. Insulin injection technique was one of the skills identified and taught during the second year curriculum. The OSCE was utilized to assess competency of the core skills. A specific OSCE was developed to assess the students’ ability to educate patients on proper insulin injection technique. The OSCE was performed by second year students 2 months after acquiring the training. In order to assess the retention of the skill, the same OSCE was conducted among third year students who acquired the training 15 months prior. The OSCE checklist consisted of two sections, 9 items on insulin injection skills and 7 on communication skills. The overall performance and the mean difference between the two classes were analyzed using the student t-test. Results: 136 second-year and 126 third-year pharmacy students participated in the OSCEs. Second and third year students demonstrated >80% competency, with no significant difference in the overall score (mean ± SD), 13.30 ± 1.63 and 13.25 ± 1.61 (p = 0.416), respectively. However the third year students scored lower on insulin injection skills, 6.52 ± 1.32 compared to 6.86 ± 1.21 (p = 0.014), while scoring higher on communication skills, 6.74 ± 0.57 compared to 6.42 ± 0.87 (p < 0.001). Implications: The results demonstrate that students’ insulin injection training skills decreased over time, while their overall counseling skills improved.

Civic Engagement, Service Learning and the U.S. Constitution. Therese I. Poirier, Southern Illinois University - Edwardsville. Objectives: An educational program for first year pharmacy students prior to their service learning experience is described and an evaluation of the implications of the assessment findings is presented. The purpose is to address the Constitution Day requirements and share the inter-relationships for civic engagement and service learning. Methods: First year pharmacy students are required to participate in a required service learning experiential course. The U.S. Congress also mandates that each educational institution hold an educational program on the U.S. Constitution. A brief program was prepared to address these goals: 1) educate on the U.S. Constitution using an assessment quiz; 2) motivate students for civic engagement; 3) share the value in obtaining a Master in Public Health or Master in Public Administration for those interested in changing people’s lives and making a difference in society; and 4) demonstrate how the School of Pharmacy’s curriculum addresses civic engagement responsibility. Results: Details on the educational program and the assessment tool on the U.S. Constitution will be presented. Seventy-seven students participated in the program. The average score on the assessment quiz was 6.3 out of 12 (52.5%). Over 60 % of students informally indicated that they saw value in having further training such as in public health or administration. Implications: Student’s knowledge on the U.S. Constitution is deficient and reaffirms the need to present programs on the Constitution, the responsibility for civic engagement and how the curriculum addresses civic engagement responsibility.

Colleges of Pharmacy Faculty’s Ranking of the Top Journals in Their Respective Disciplines. Nile M. Khanfar, Nova Southeastern University; Mark L. Glover, Nova Southeastern University. Objective: To determine faculty’s perceptions of the most significant journals within their discipline. Methods: An email was sent to 4219 full-time faculty, at 100 colleges of pharmacy, as listed in the American Association of Colleges of Pharmacy 2005/2006 Roster of Faculty and Professional Staff publication, asking them to participate in an on-line survey to identify the top five journals in their respective disciplines. The email contained the instructions, electronic address, and user identification code for the 12-item survey. A reminder email was sent ~12 weeks later. Results: Nine hundred thirty four (22%) faculty completed the survey. The majority of the respondents were male (61%), Caucasian (82%), tenured (46%), assistant professors (37%), and between 30-39 years of age (32%). An equal percentage (26%) of faculty indicated either 2-5 years or greater than 20 years of academic experience with the Pharm.D. (53%) or Ph.D. (42%) being the most common degree of the respondents. The most prevalent disciplines represented were Pharmacy Practice (56%), Social and
Administrative Sciences (11%), Pharmaceutics (11%), Medicinal Chemistry (9%), and Pharmacology (8%) with the majority of Pharmacy Practice faculty representing Ambulatory Care (13%). Within these disciplines, the most preferred journals were The New England Journal of Medicine, Social Science and Medicine, Pharmaceutical Research, Journal of Medicinal Chemistry, The Journal of Pharmacology and Experimental Therapeutics, and The New England Journal of Medicine, respectively. Overall, The New England Journal of Medicine achieved the highest ranking. **Implications:** The New England Journal of Medicine is the top ranked journal among pharmacy faculty.

**Communication Skill Development: OSCE Assessment of Lay and Healthcare Provider Encounters.** Cindy D. Stowe, The University of Arkansas; Catherine E. O’Brien, The University of Arkansas; T. Scott Warnack, The University of Arkansas; Stephanie F. Gardner, The University of Arkansas. **Objective:** The objective was to determine if student communication skills differ between patient and physician encounters. **Methods:** The class of 2008 (n = 80) participated in an OSCE as the final in Therapeutics I (Spring P2 year) and Therapeutics II (Fall P3 year). OSCE encounters used standardized participants (SPs) that were either physician- or patient-SPs. Therapeutics I OSCE had 3 physician-SP & 2 patient-SP encounters and Therapeutics II OSCE had 4 physician-SP & 2 patient-SP encounters. Each encounter was graded with a dichotomous therapeutic and communication skill checklist. The communication checklist was the same for all encounters. A communication score was calculated based on the following items: “used appropriate terminology”, “was sensitive to situation”, and “was confident”. Communication scores were compared using a paired T-test. Data are presented as mean ± SD with an alpha level of 0.05. **Results:** The average communication score for physician-SP encounters (96.3% ± 5.06) was greater than patient-SP encounters (88.3% ± 7.9, p < 0.05). This difference was greater in Therapeutics I (physician-SP = 97.3% ± 6.1 & patient-SP = 87.9% ± 18.4 & p < 0.05) than in Therapeutics II (physician-SP = 95.3% ± 6.9 & patient-SP = 88.8% ± 19.4 & p < 0.05). There was no difference in the Therapeutics I and II average cumulative communication scores (93.4 ± 9.4 & 93.1 ± 9.2, respectively). **Implications:** These students appear to have greater skill when communicating with physicians than with patients. Further evaluation of these data needs to be undertaken to determine the cause of such differences and variability in the lay encounters.

**Community Engagement: A Service-Learning Practicum in a Hispanic Underserved Community in Puerto Rico.** Sacha Rivera, University of Puerto Rico; Myriam L. Gonzalez, University of Puerto Rico. **Intent:** The objectives of this practicum are: (1) Engage PY2 students in community health-related issues by collaborating with four community-based organizations, (2) Offer service to the community in accordance to the needs identified by the organizations and contextualized to the pharmacy profession, and (3) Contribute to the development of the abilities of the Doctor of Pharmacy Program. **Process:** Students are assigned to an organization and become familiarized with its mission, goals, objectives, and operation. The organization identifies the community’s health needs and the students, in collaboration with the organization, develop a plan to address them. The plan is discussed with the members of the organization, and is then revised, implemented, and evaluated. The students offer recommendations to the organizations with the purpose of improving their impact on the community. The impacted Hispanic underserved population includes children, youths, adults, and the elderly. Assessment activities include a reflective journal, and students’ and organization’s evaluations. **Outcomes:** Some of the needs identified were: concerns with high medication costs, medication compliance, disease prevention and health promotion. Students participated in community engagement activities by developing educational materials, offering health talks, and visiting community-based organizations as well as participants’ homes. Students demonstrated the achievement of the following abilities: problem-solving and decision-making, communication, ethics, social conscience and responsibility, social interaction, pharmaceutical care, and self-learning and professional development. **Implications:** An advantage to this approach is the continued offering of service to community-based organizations. The successful results of students’ interventions have brought other community-based organizations to participate in this Practicum.

**Comparison of Publication Rates among Pharmacy Deans.** Dennis F. Thompson, Southwestern Oklahoma State University; Erin D. Callen, Southwestern Oklahoma State University. **Purpose:** Guideline 8.1 of the 2007 ACPE Standards states that the Dean of Pharmacy must have “publications in the pharmacy and biomedical literature in areas relevant to the mission and goals of the college or school.” The purpose of this project was to quantify pharmacy Dean publications using the Medline database. **Methods:** Deans were identified using the 2005/2006 Roster of Faculty from AACP. Dean names were then searched using the online provider PubMed. Searches were done with no restrictions placed on language, year of publication, or type of article. Most searches were straightforward although some publication lists had multiple authors with the same name, particularly if the Dean had a common name on PubMed. In these cases, decisions on inclusion were made by viewing the subject matter of the paper, co-authors, address of the authors, and viewing the original article or abstract. When judgments were made with incomplete data, we erred on the side of article inclusion rather than exclusion. **Results:** A total of 2677 lifetime publications were published by 86 Deans. Mean of the data was 31 [95% CI 21-41] with a high of 338 and a low of 0. Deans from public schools published significantly more papers than Deans from private schools (p < 0.01) Seventeen Deans (20%) accounted for 78% (n = 1622) of the total publications. Almost one-quarter of all Deans had 5 or less lifetime publications on PubMed. **Conclusion:** It is doubtful that all pharmacy Deans are meeting ACPE Guideline 8.1 as it might relate to journal publications.

**Completion of Pre-pharmacy Requirements at Community Colleges (CC): What is the Association With PharmD GPA?** Philip D. Hall, South Carolina College of Pharmacy – MUSC Campus; Roger L. White, South Carolina College of Pharmacy – MUSC Campus. **Background:** Barron’s Profiles ranks the competitiveness of undergraduate (UG) institutions; however, community colleges (CC) are not included. Previously, we found that UG-GPA and PCAT were not related. Since some applicants complete pre-pharmacy requirements at CC, we evaluated UG ranking and CC attendance as a predictor of PharmD GPA. **Methods:** We evaluated relationships between UG ranking and GPAs of 2003-06 PharmD graduates. UG institutions at which these graduates completed pre-pharmacy courses were categorized and ranked as follows: most competitive (MC = 5), highly competitive (HC = 4), very competitive (VC = 3), competitive (C = 2), less competitive (LC = 1) and community college (CC = 0). Relationships between UG-GPA, PCAT, UG ranking and PharmD GPA were assessed by univariate and multivariate regression. **Results:** Records were available for 191 students
For an individual working with a challenging student issue; a means of group support; enhanced communication among group members and with other administrators, students and faculty; providing an opportunity for student requests and cases to be discussed; a reduction in the student’s ability ‘shop around’ for their desired outcome; and enhanced decision making given the variety of individuals providing input. The major limitations to this process include time required to meet and see the outcomes to completion.

Developing a Role for a Pharmacy Resident in a Multidisciplinary Obesity Clinic at a Veterans Affairs Hospital. Rabia Tahir, St. John’s University. Purpose: To develop and evaluate the role of a pharmacy resident in a collaborative, multidisciplinary approach to weight management as part of the educational experience during a PGY1 residency. Methods: The Department of Veterans Affairs has initiated a national multidisciplinary weight loss program in 2006. Patients at our VA institution participated in both individual and weekly group sessions with various members of a multidisciplinary team, which included a pharmacy resident. The resident’s interventions included providing weight management education, medication therapy management, and individual counseling sessions. Periodic meetings with the residency coordinator and other health care professionals were done to assess the resident’s activities. In addition, patient satisfaction surveys were administered at the end of each group session. Results: During the study time period, two 10-week program periods were completed and included four group educational sessions conducted by the pharmacy resident. Topics during the group sessions included weight-management education and the benefits of weight loss. A total of 54 (80%) subjects were interested in a consult with the pharmacy resident for medication therapy management and 33 (61%) were actually seen. Satisfaction surveys revealed that 96% of patients believed that they benefited from the resident’s interventions. Conclusion: The inclusion of a pharmacy resident in a multidisciplinary weight loss clinic proved beneficial from both an educational and patient outcomes perspective. The resident was provided an opportunity to refine their clinical, communication, and project management skills as part of this clinic. Both patients and allied health professions valued the contributions of a pharmacy resident.

Decision Making: A Model to Promote Better Outcomes for Students and Their Academic Programs. Elena M. Umland, University of the Sciences in Philadelphia; Lisa A. Lawson-Gibson, University of the Sciences in Philadelphia; William J. Cunningham, University of the Sciences in Philadelphia. Background: A group coined ‘Brain Trust’, including the Associate Dean of Pharmacy, the Assistant Dean of Student Development, the Director of Pharmacy Student Advising and members of the advising center, and the Director of the PharmD program meets bi-weekly to discuss students and student issues in a medical rounds-like forum. Objective: This study evaluates and categorizes the meeting outcomes. Process: Meeting minutes from the fall and spring semesters of 2006 were evaluated and the outcomes of all discussions were categorized. The categories identified include individual student issues, student policies, curricular issues, advising and communication, and miscellaneous. Results: Ninety actionable outcomes resulted from this bi-weekly meeting series over two semesters. Of these outcomes, the number and percentage in each category were: 24 (26.7%) individual student issues; 24 (26.7%) student policies; 32 (35.6%) curricular issues; 5 (5.5%) advising and communications; and 5 (5.5%) miscellaneous. Implications: The benefits of the ‘Brain Trust’ meetings as identified by the participants include: input gathered from a variety of individuals with different vantage points relative to the PharmD program; balancing pressure and emotional involvement for an individual working with a challenging student issue; a means of group support; enhanced communication among group members and with other administrators, students and faculty; providing an opportunity for student requests and cases to be discussed; a reduction in the student’s ability ‘shop around’ for their desired outcome; and enhanced decision making given the variety of individuals providing input. The major limitations to this process include time required to meet and see the outcomes to completion.
and answering questions regarding drug interactions, side effects, adherence issues, and consequences if untreated or unrecognized. 

**Conclusion:** Available time for expanded sleep education is lacking in pharmacy school curricula. To maximize the educational experience in our Pharmacotherapy Lab, six cases on different sleep disorders were designed and implemented. These cases increased the number of sleep disorders studied and provided a broader sleep education for second-year pharmacy students.

**Development of a Peer Observation and Evaluation Tool (POET) for large classroom teaching.** Margarita V. DiVall, Northeastern University; Judith T. Barr, Northeastern University; Mark A. Douglass, Northeastern University; Michael J. Gonyeau, Northeastern University; Jennifer L. Kirwin, Northeastern University; Samuel J. Matthews, Northeastern University; Thomas C. Pommert, Northeastern University; Jenny A. Van Amburgh, Northeastern University; Emanuel Mason, Northeastern University; Donna M. Qualters, Northeastern University; Jennifer M. Trujillo, Northeastern University. 

**Objective:** To develop a valid and reliable peer observation and evaluation tool (POET) to be used in a large classroom setting as part of a comprehensive teaching assessment program. 

**Methods:** POET was developed by consensus of a 9-member peer observation taskforce after an extensive literature search, review of peer evaluation at similar academic institutions, and direct input from an external expert on peer observation of teaching. To establish validity, each taskforce member and the external expert provided feedback on organization, terminology, and clarity and independently ranked each item on a scale of 1 (no importance) to 5 (high importance). Items with a mean score below three were removed. Remaining items were reorganized and modified based on feedback. After receiving peer observation training, taskforce members piloted POET on a pre-recorded lecture. Based on consensus, POET was streamlined further and descriptors were added. To establish inter-rater reliability, 2-3 taskforce members observed eight separate lectures utilizing POET. Intra-class correlations (ICCs) were computed for each lecture. 

**Results:** POET contains scripted interview questions for pre- and post-observation meetings and a 39-item rubric to evaluate lecture content, presentation skills, classroom climate, and assessment strategies. ICCs ranged from 0.67 to 0.90 indicating very good inter-rater reliability. Data from one rater on three occasions were excluded due to low variability in response scores which produced negative ICCs. 

**Implications:** POET is a valid and reliable tool to evaluate large classroom teaching when used by trained peer observers. The effectiveness of POET as an assessment tool warrants further study.

**Development of an Interdisciplinary Palliative Care Elective.** Claire Saadeh, Ferris State University. 

**Objectives:** An interdisciplinary palliative care elective course was developed to enhance the pharmacy curriculum in end-of-life education. The primary goals for this course include introducing the student to the interdisciplinary nature and principles of palliative care, emphasizing the role of the pharmacist, and also enhancing the students’ ability to determine appropriate pharmacological management for pain and symptom control in the dying patient.

**Methods:** This two-semester credit course is offered during the third professional (P3) year of the PharmD curriculum. Enrollment is limited to 30 students in order to facilitate a more interactive and intimate learning environment. To emphasize the interdisciplinary approach, this course utilizes a variety of professionals with clinical expertise in palliative care - nurses, physicians, pharmacists, chaplain, and attorney. A formal evaluation was designed and conducted in order to solicit student’s comments on changes in their perceptions and knowledge of palliative care. 

**Results:** A total of 75 students have successfully completed this course over a three year period. Of the 74 students surveyed, sixty-six (89%) indicated that this course had a positive impact on their perception and knowledge of palliative care. All of the students surveyed indicated they would recommend this course to future P3 pharmacy students. 

**Implications:** This elective course enhances the quality of our pharmacy school curriculum, and meets the 2007 ACPE accreditation standards provision of pain management and palliative care. This course design will promote the introduction of electives that integrate multiple areas of patient care as the practice of pharmacy evolves.

**Early Practice Experience Cases: Three Year Experience and Evaluation as a Teaching Resource.** Condit F. Steil, Samford University; Andrew A. Webster, Samford University. 

**Objective:** To investigate the value of early practice experience case reports as a training enrichment resource through the curriculum. 

**Method:** During the first and second year early practice experience rotations students are required to document cases from the clinical experience of interesting or unique drug related events. Good documentation is encouraged as the first year rotation immediately follows an introductory course in clinical communication. These cases are maintained in a journal that is turned in as part of the documentation requirements of the rotations. Then during the third year advanced pharmacy practice course, the students are assigned a presentation of one of their cases as selected by the course coordinator for the student to present to their lab group (approximately twenty students). The students’ presentations are evaluated for the content, literature support where applicable, and presentation style as part of the advanced practice course. This format has been employed for three years. Further, evaluations of this process by the students using a survey document developed for this project and guest faculty have been conducted annually. 

**Results:** Student evaluations will be presented along with a listing of the subjective comments by the students. The evaluations indicate a positive trend toward appreciation of the value of drug information retrieval and clinical presentation skills. Guest faculty evaluation comments are also included. 

**Implications:** Student early practice experience cases can be a valuable source of instruction. Presentation skills can be improved through this type of exercise, facilitating student performance in advanced practice experience rotations.

**Early introduction to Continuous Professional Development (CPD) as part of a Therapeutics Course.** Anita Young, Northeastern University; Debra A. Copeland, Northeastern University; Margarita V. DiVall, Northeastern University. 

**Objective:** To utilize existing online Continuing Pharmacy Education (CPE) programs to augment therapeutics course content and introduce students to the concept of Continuing Professional Development (CPD). 

**Methods:** P3 students were assigned to complete the online Adult Immunization Training Program (AITP) as part of therapeutics course requirements. Bonus points were awarded for successful completion of both required (0.2 CEU) and elective (0.5 CEU) components. The AITP met all ACPE requirements. Students were surveyed to assess attitudes about early introduction of CPD. 

**Results:** All but 1 student and 96% (N = 110) completed the required and the elective CPE programs, respectively. AITP evaluations were positive. Forty-five students (41%) completed the survey. Fifty-two percent of students were enthusiastic about the activity when it was assigned. Upon completion of AITP, the level of enthusiasm increased for 16%, stayed the same for 63% and decreased for 21% of the students. Students identified the following courses as those that could be augmented with online CPE activities: Therapeutics (75%), Non-prescription medications (75%), Jurisprudence (58%), and Health Care Systems (25%).
Thirty percent of students would repeat this activity if it was not required and 20% would repeat it without the benefit of extra credit. Among the negative comments provided about the CPE activity, time constraints were the most commonly cited. Implications: Successful early introduction of CPE activities can accomplish many objectives, including course content augmentation and fostering life-long CPD. Further exploration of utilization of such activities across pharmacy curriculum is warranted.

Effects of Interdisciplinary Discussions on Attitudes and Perceptions among Dental, Social Work and Pharmacy Students. Jackie Diercks, University of Washington; Annie Y. Lam, University of Washington; H. Asuman Kiyak, University of Washington. Objective: Interdisciplinary teamwork and collaboration are important learning experiences for health professional students. This study evaluates students’ attitudes and perceptions about interdisciplinary learning. Methods: Subjects of the study are health professional students participating in an interdisciplinary project involving three disciplines: Dentistry, Pharmacy and Social Work. These students worked together in the University of Washington Mobile Geriatric Dental Clinic sites in adult day health centers in King County, Washington. The design of this study is a pre/post 15-item Likert-scaled survey, administered anonymously to the students before and after their participation in the interdisciplinary project. Categories of questions in the survey included knowledge of each profession, attitudes towards interdisciplinary care, and project participation. Student demographic data was also collected. The averages of the pre- and post-survey scores were calculated. The 2-tailed student t-test was used for statistical analysis to assess differences, with significance set at p-value < 0.05. Results: Data from 12 participants, (6 dental, 4 pharmacy and 2 social work students, age average 25.6 ± 1.57 years, 9 females and 3 males), showed an increase in the students’ knowledge of each other’s professions and improvements in attitude towards interdisciplinary learning after participation in the project. The mean pre- and post-Likert scaled scores were 3.95 ± 0.196 and 4.42 ± 0.145, respectively (p = 4.94e-08). Implications: The results of this study showed interdisciplinary learning activities impact positively on a student’s attitudes and/or perceptions of each other’s profession. Interdisciplinary activities involving different health professional programs should be encouraged and promoted.

Employing Video Technology to Enhance Pharmacy Students’ Patient Counseling Skills. Joseph M. Brocavich, St. John’s University; Joseph V. Etzel, St. John’s University; William M. Maidhof, St. John’s University. Objective: To strengthen students’ patient counseling skills through the creation of an ongoing video record as part of a patient simulation laboratory. Methods: In Fall 2005, video recording equipment was installed in the patient simulation laboratory. As part of the laboratory’s exercises, students routinely counsel simulated patients on the correct use of their medications. These counseling sessions were videotaped and graded by the laboratory’s faculty. Over the course of the academic year, there were 16 laboratory counseling sessions. Each student was given his/her DVD and required to review the sessions and grade his/her performance using the laboratory grading form. Additionally, each student was required to develop a self improvement plan. The self improvement plans were forwarded to the Fall 2006 laboratory faculty to assist the students in implementing their personal plan. The student self assessment forms were matched to the faculty assessment forms and were compared for correlation and significance. Results: A total of 138 students were included in the analysis. A total of 1237 matched data sets of self/faculty assessments were compared and a high degree of correlation was noted (r = 0.259, p < 0.01). Students tended to be more critical of their communication skills compared to faculty. A qualitative summary of the self improvement plan will be presented.

Evaluation of Internet-based Computer-aided Learning for Augmented Training Within Fourth Year Community Clinical Clerkships. Ross E. Vanderbilt, University of Arkansas; Schwarda K. Flowers, University of Arkansas; Jan H Kastings, University of Arkansas; Donna S. West, University of Arkansas. Objective: The use of Internet-based interactive computer-aided-learning (CAL) to augment the training of fourth year students rotating through Advanced Practice Community (APC) clerkships was evaluated. Methods: With APC clinical training sites serving as their own controls over 9 months, students were randomized into study and control groups. Both groups of students were administered pre-tests to evaluate and compare their baseline information for the counseling of patients in the use of inhalers and ear- and eye-drops. These products were selected because they require more sophisticated patient counseling. Those students in the study group were given an Internet address (http://cop.uams.edu/med2/index.htm) for access to ultra-short, interactive, multi-media, student controlled CAL to augment and standardize their counseling training. The training clips lasted from 1:31 to 3:51 minutes long; ideal for on-the-spot training. At the conclusion of the month-long clerkship both groups of students were administered post tests. Results: Using paired T-tests, those students given the opportunity to self-train using the Internet-based CAL had a statistically significant increase in their counseling training at P < 0.001 and gave positive feedback about the training. The control group did not experience any statistical increase in their counseling knowledge of the research topics during their month long experience. Implications: It is difficult for Colleges of Pharmacy to standardize and provide a consistent training experience for widely dispersed community pharmacy training sites. It was documented that through the use of CAL to augment, efficiently deliver, and standardize experiential training that outcome performances can be improved.

Evaluation of a Pharmacist Interactive Clinical Case Series. Lauren S. Schleselman, The University of Connecticut; Craig I. Coleman, The University of Connecticut, C. Michael White, The University of Connecticut. Objective: The objective of this project was to evaluate the effectiveness of a new learning format for patient-based clinical cases for didactic courses. Methods: After approval by the Institutional Review Board, fourth professional year pharmacy students were offered the opportunity to evaluate 4 computer-based, interactive, clinical cases. Students were asked to review at least 2 cases and complete a post-case survey. The survey assessed the new cases as a teaching tool and compared them to currently utilized paper-based and non-interactive cases. Results: Twenty-five fourth professional year students participated in the evaluation the pharmacist interactive clinical case series (PICCS). Each student evaluated an average of 2.9 ± 0.9 cases, reporting that cases took an average of 0.6 hours. On a scale of 1-10, students rated traditional cases as a 5.7 ± 1.4 for their effectiveness in preparing them for APPE rotations, while the PICCS rated 8.3 ± 1.0 (p < 0.0001). The content and format of the PICCS cases also rated higher than the traditional cases, 8.5 ± 1.0 vs. 6.3 ± 1.6 (p < 0.0001) and 8.5 ± 1.0 vs. 6.0 ± 1.6 (p < 0.001), respectively. As an overall learning tool, PICCS outscored traditional cases 8.8 ± 1.2 vs. 6.0 ± 1.5 (p < 0.0001). The students also reported that they would “definitely have been more likely to work up cases
Evaluation of Number and Quality of Published Scholarly Works by Department of Pharmacy Practice Faculty (2001-2003). Lauren S. Schlesselman, The University of Connecticut; Craig I. Coleman, The University of Connecticut; C. Michael White, The University of Connecticut. Objective: Evaluate the quantity and quality of published literature conducted by Pharmacy Practice faculty for the years 2001-2003. Methods: We utilized the Web of Science bibliographic database to identify publication citations for the years 2001 to 2003 which were then evaluated in a number of different ways. Faculty were identified via American Association of Colleges of Pharmacy rosters for 2000-2001, 2001-2002, and 2002-2003 academic years. Results: Overall, 2,374 Pharmacy Practice faculty members generated 1896 publications. Rankings were done based on the number of publications per institution and average number of publications per faculty member at an institution. A relationship exists between an institution’s faculty size and the total number of publications but not for tenure/nontenure-track faculty ratio. Midwestern schools were responsible for more publications per institution than other regions. The average impact factor for the top 200 publications was 7.60. A small number of faculty (2%) are responsible for a large proportion of publications (30.6%). Conclusion: Pharmacy Practice faculty contributed substantially to the biomedical literature and their work has had important impact. A substantial portion of this work has come from a small sub-set of faculty.

FOG Readability Levels of Required Materials. Steve H. Fuller, Campbell University; Robert M. Cisneros, Campbell University; Cheryl B. Horlen, Campbell University; Tonja N. Merz, Wingate University. Many educators may assume that required reading materials are written at a level which is comprehended by students. However, many students may be overwhelmed by the complexity of textbooks and primary literature. Weeks and Wallace have reported that articles from the Journal of the American Medical Association read at a grade level of 17.8. A question which we consider is whether the reading abilities of pharmacy students were comparable to the reading level of their assigned readings. Therefore, we determined the reading level of pharmacy students in the third professional year of pharmacy school by using the Nelson-Denny Reading Test (NDRT). We also assessed the readability level of several assigned readings: nine selected chapters from Dipiro's Pharmacotherapy: A Pathophysiologic Approach, as well as published treatment guidelines from the primary literature using the Gunning FOG formula. According to recent studies, the FOG-reading formula has a correlation of \( r = 0.91 \) with reading comprehension. Our NDRT results show that the students read at an average grade level of 16.5. Selected Dipiro chapters read at a grade level of 18.1 and selections from the primary literature treatment guidelines read at grade level 19.2, as determined by the Gunning FOG formula. Our study revealed a discrepancy between student reading grade level (which has been found to be related to comprehension) and readability of medical information. We plan to further explore this finding and discuss ways to bridge this gap. References available upon request.

Faculty Awards at U.S. Colleges and Schools of Pharmacy. Michelle M. Kalis, Massachusetts College of Pharmacy and Health Sciences – Boston; Harold L. Kirschenbaum, Long Island University. Objectives: Limited data exist regarding recognition provided for outstanding teaching, service, and scholarship at college and schools of pharmacy. Methods: In February 2006, a self-administered questionnaire was made available on-line to deans at the 89 colleges/schools of pharmacy. Results: A total of 64 usable responses (72%) were obtained. An award to acknowledge teaching excellence (92%) was most commonly reported, followed by an award for adjunct/volunteer faculty/preceptors (79%). The majority of the institutions (31 out of 58) reported offering one teaching award annually. The two most common methods for selecting the recipient of the teaching award were student vote and a committee vote following nominations. Being a full-time faculty member (39 out of 57) was the most common eligibility criterion. The 57 respondents indicated that teaching award winners receive: a plaque (51 out of 57), recognition at a ceremony (40 out of 57), monetary award (27 out of 57), travel funds (18 out of 57), and professional development funds (7 out of 57). Twenty-four of the 63 respondents indicated that their institution provides an award for research/scholarship and 18 an award for outstanding service. The respondents perceived the benefits of the faculty awards were faculty recognition among their peers and enhancement of faculty morale. Most recipients remain employed by the college/school two years after receiving recognition. Implications: These data indicate that although the methods vary, teaching excellence is recognized and rewarded at colleges/schools of pharmacy; however research/scholarship and service are less formally recognized.

Formation of a Student-Initiated Academia Advanced Practice Experience. Marilyn J. Novell, Rutgers, The State University of New Jersey; Jacqueline L. Olin, Wingate University. Objective: To provide the student with hands-on exposure to facets of academia and identify responsibilities of an academic clinician including teaching, scholarship, service to the profession, and clinical practice. Methods: Methods included advanced preparation and planning between student and preceptor to accomplish outcomes during this novel ten-week rotation. Experiences included: (i) creating and presenting didactic pharmacy lectures with handouts (class sizes from 38-280 students); (ii) developing and administering examination questions; (iii) proctoring and grading for written and practical examinations; (iv) preparing a clinical case presentation; (v) coordination and implementation of review sessions; (vi) ACPE faculty/staff committee and report preparation involvement; (vii) utilization of WebCT and other instructional technologies; (viii) review of advertised faculty positions and appointment interviewing technique analysis; (ix) introduction to faculty promotion/reappointment process; (x) participation in peer-review journal editorial process; (xi) P3 shadow visit preceptorship; (xii) journal club and case presentation grading process; (xiii) community outreach presentations; (xiv) professional organization involvement; (xv) clinical activities including patient rounds, committee meetings, and resident noon conferences. Steps were taken to ensure student confidentiality and integrity. Anonymous feedback was solicited from underclassmen. Results: This student-initiated clerkship provided the Pharm.D. student a unique rotation opportunity not previously offered by the institution. The student developed an understanding of the academic clinician responsibilities, and experienced skills important in the development of an effective pharmacy faculty member. Feedback from both students and faculty was positive. Implications: The design and results of this
Identification of Required Core Activities for Advanced Community Pharmacy Clerkship Training. Peggy G. Kuehl, University of Missouri - Kansas City; Patricia A. Marken, University of Missouri - Kansas City. Objectives: The UMCK School of Pharmacy developed a process to assess quality and consistency in and among our community advanced pharmacy practice experiences (APPEs). Factors necessitating such a process included: new ACPE standards, increased class size, suspected lack of consistency among current sites, need to provide direction for APPE preceptors during site development, ability to assess change in sites over time and need for an objective method to assess site readiness to begin training students.

Methods: Five community preceptors known to practice patient-focused care served as the expert panel. Panel members rated the importance of various practice activities and site characteristics as part of an APPE experience. Activities and site characteristics were extracted from the Community Practice Metrics portion of the AACP Academic-Practice Partnership Initiative’s Site Specific Criteria for Excellence. Ratings ranged from: 4 = core competency to 1 = not important. Mean ratings >3.5 indicated an activity or characteristic that is a core competency. Results: Seven activities/characteristics were identified as core competencies for APPEs in community settings. They are provision of 1) MTM/DSM services, 2) OTC consultations, 3) polypharmacy consultations; 4) documentation using SOAP notes; 5) provision of recommendations to patients’ physicians; and requirements that students 6) provide drug information and 7) complete a project. Implications: Faculty and community pharmacy preceptors will use the core competencies to assess the readiness and ongoing ability of community sites to offer APPEs. This list should also stimulate discussion of new services among affiliated community sites and spur their development.

Impact of a Service Learning Experience on Students in a Geriatric Pharmacy Practice Course. Patricia W. Slattum, Virginia Commonwealth University; Heather A. Greene, Virginia Commonwealth University; Brigitte L. Sicat, Virginia Commonwealth University. Objective: To evaluate the impact on students of a service learning project designed to assist VCU Health System (VCUHS) patients with Medicare Part D and to educate students about the process and experiences of beneficiaries. Methods: Faculty and VCUHS staff formulated the project. Students received classroom training on Medicare Part D and indigent care at VCUHS, and completed a homework assignment. Each student spent four hours assisting patients at VCUHS pharmacies by providing information and navigating Medicare.gov. Students wrote reflective papers identifying barriers to enrollment and actions to overcome them, and describing how their pharmacy knowledge impacted the process. Content analysis was performed on 49 de-identified papers. Two investigators reviewed each paper using explicit criteria to categorize the barriers identified, actions taken, perceived value of pharmacy skills, and students’ spontaneous expression of value of the experience. A third investigator adjudicated discrepancies between reviewers. Response frequency in each category was compiled.

Results: Students (n = 54) provided over 200 hours of assistance, serving approximately 130 seniors. Forty-six papers identified barriers related to patient factors and 42 related to Medicare program factors. Twelve papers reported interventions to overcome patient-specific barriers of education, language, hearing, vision, cognition and finances. 80% found value in “real life” application and 67% in professional development. Four papers described additional volunteer activities motivated by the project. Implications: Service learning offered students the opportunity to gain experience in communication, cultural sensitivity, professionalism and problem solving as well as a better understanding of Medicare Part D and difficulties experienced by seniors.

Incorporating Scoring Rubrics into the Assessment of Student Performance in a University-Based Pharmaceutical Care Clinic. Andrew P. Traynor, University of Minnesota; Michael C. Brown, University of Minnesota; Casey E. Gallimore, University of Minnesota; Todd D. Sorensen, University of Minnesota. Intent: To use scoring rubrics to improve student performance feedback and assess areas for student improvement in activities of a pharmaceutical care clinic.

Process: A series of online scoring rubrics were developed for preceptor use when evaluating student performance in a pharmaceutical care clinic. Rubrics were developed based on standards for the pharmaceutical care assessment, pharmacotherapy case presentation and documentation principles. Rubrics were available to students prior to activities. Instructors utilized paper rubrics, with online entry following the activity, or online rubrics utilizing TabletPCs to assess the student activity. Students received verbal feedback from their preceptor following each clinic component and were emailed rating reports from the online system. Outcomes: Use of online scoring rubrics in the pharmaceutical care clinic enhanced documented feedback and complemented verbal feedback. Student feedback showed an improvement in students strongly agreeing that preceptors provided adequate feedback (33.7% in 2004/2005 vs 48.1% in 2006). Students (N = 156) most commonly received needs improvement ratings for components including: establishing current health status (37.2%), assessing for drug therapy problems (33.3%), plan documentation (28.2%) and establishing goals of therapy during case presentations (26.9%). Preceptors reported the rubric was valuable in giving timely, specific feedback and in justifying overall activity ratings. Implications: The implementation of a scoring rubric in the

clerkship provide an experiential format for future clerkships in academia.

Graded verses Pass/Fail Advanced Pharmacy Practice Experiences. Amy S. Peak, Butler University; Sarah Oldaker, Butler University; Lindsay Whisenant, Butler University. Objective: To assess the perceptions of students and preceptor practitioners on the use of graded verses pass/fail advanced pharmacy practice experiences (APPEs). Methods: Electronic surveys were sent to preceptor practitioners and pharmacy students from Colleges of Pharmacy in the state of Indiana, one of which used graded assessment methods for APPEs, the other uses a pass/fail system. Results: 196 students and 239 preceptors responded to the survey. Most preceptors (63%) and students (61%) felt that grades motivate students to perform at a higher level. Most students in pass/fail systems (68%) felt that graded APPEs stimulate unhealthy competition, but few students in graded systems (26%) or preceptors (23%) agreed (P < 0.001). All groups felt that students experience more stress when APPEs are assessed using a graded system. Compared to preceptors and students in graded systems, students in pass/fail systems were significantly more likely to believe pass/fail assessments fairly reflect student effort, knowledge, and abilities. Although not every respondent had an opinion on the optimal APPE assessment method, few preceptors (28%) and even fewer students (19% of those in graded systems and 20% of those in pass fail systems) felt that graded APPEs were optimal. Students with lower GPAs prior to starting APPEs were significantly more likely to prefer graded systems while students with higher GPAs were least likely to believe that graded APPEs were optimal. Implications: Information from this study can be easily extrapolated to help Colleges of Pharmacy make informed decisions on which APPE assessment model is best for their institution.
pharmaceutical care clinic was successful. Adjustment of the rubric will be completed based on first year use. Further use of the rubric will be valuable in targeting learning experiences that address areas where students most commonly received needs improvement ratings.

Integration of Team-Based Learning into a Women’s Health Course. Brigitte L. Sicat, Virginia Commonwealth University. Objectives: Team-based learning (TBL) is an instructional strategy that is based on procedures for developing high performance learning teams that can enhance the quality of student learning. The objective is to describe student perceptions of the integration of TBL into a Women’s Health Course. Methods: The Women’s Health elective is offered to students in their third year of the Doctor of Pharmacy curriculum. The course format, delivery, and assessments were revised to incorporate TBL in fall 2006. Fifty-six students were enrolled in the course and divided into 9 teams. The TBL instructional activity sequence involved the Readiness Assurance Process (assigned readings with learning objectives, individual and group readiness assessment tests, an opportunity to appeal the group readiness assessment test, and instructor feedback) followed by application exercises. Students were asked to evaluate the course by completing a voluntary anonymous evaluation. Results: All 56 students completed the evaluation. Course evaluations were favorable with means of 3.5 to 4.0 on a 4-point Likert scale on 20 questions. A total of 82%, 88%, and 82% students “agreed” or “strongly agreed” that TBL helped to promote an increased understanding of course content, apply course concepts to solve problems, and think critically, respectively. Eight-nine percent of the class indicated that TBL helped increase their understanding of the skills needed in order to work productively as a task-group member and 89% felt TBL provided a positive opportunity to learn from other students. Implications: Students perceived TBL to be effective in enhancing the quality of their learning.

Interactive Sessions/Discussions for Clerkship Students, Preceptors, and Faculty: A Collaborative Learning Opportunity. Jane E. Krause, Purdue University; Cynthia P. Koh-Knox, Purdue University. Objectives: To incorporate and assess regional interactive sessions/round table discussions for students, preceptors, and faculty into the advanced pharmacy practice experiences at Purdue University. Methods: Two hour interactive sessions/round table discussions are held monthly throughout Indiana (i.e., in areas/regions of concentrated advanced pharmacy practice experiences). All students, preceptors, and faculty are invited to attend a session which consists of student presentations and focused discussions. Feedback regarding the sessions is obtained annually from the students, preceptors, and faculty participants. Results: Interactive sessions/round table discussions have been incorporated into the advanced pharmacy practice experiences at Purdue University since 1997. Monthly interactive sessions/round table discussions are currently held in six regions throughout Indiana. Each regional session is attended by approximately 10-15 students, preceptors, and faculty each month. These sessions allow the students, preceptors, and faculty the unique opportunity to work together in the evolving pharmacy environment as consistent with the experiential education component of the curriculum. Feedback suggests that the participants benefit from the collaborative exchange and cooperative sharing of information through the presentations and discussions. The development, implementation, and evolution of the interactive sessions/round table discussions at Purdue University over the past ten years are discussed. Example agendas and discussion topics are described. Implications: Such interactions help to promote cooperative learning, teamwork, and collaborative practice. This initiative also supports continuing professional development of students, preceptors, and faculty and helps to prepare students for the continuum of lifelong education.

Intergroup Variability in Objective Structured Clinical Examination (OSCE) Scores and Factors Associated with Intergroup Variability. Jeany K. Jun, Western University of Health Sciences; Eunice P. Chung, Western University of Health Sciences. Objective: To determine if timing of OSCE performance affects overall scores and identify factors associated with intergroup variability in the OSCE scores. Methods: A 3-station OSCE was conducted in one day for 136 second-year pharmacy students. Station 1 was patient education on proper insulin injection technique. Station 2 was warfarin dosage adjustment and counseling. Station 3 was recommendation to a physician on renal dosage adjustment. The students were divided into 4 groups. Groups 1 and 2 performed the OSCE in the morning, and groups 3 and 4 performed in the afternoon. To address the concern that the afternoon groups may unfairly benefit from sharing of OSCE content by the morning groups, the scores for the 4 groups were analyzed using the student t-test. The content of each OSCE station was also evaluated qualitatively to identify factors that may promote intergroup variability in performance. Results: Group 4 performed significantly better in station 3 compared to group 1 (12.61 ± 1.28 vs. 10.67 ± 2.07, p < 0.001) but performed significantly worse in station 1 (12.87 ± 1.74 vs. 13.97 ± 1.49, p = 0.004). There were no significant intergroup differences for station 2. Station 1 required performance of a skill and station 2 required problem solving, while station 3 required communication of a specific knowledge with a correct answer. Implications: Sharing of OSCE content seems to occur among students but does not always serve favorably for the latter groups. OSCEs requiring skill performance or problem solving minimize advantage to the latter groups even in the presence of information sharing.

Knowledge Gains and Student Response to an Undergraduate Course on Common Prescription Medications. Amy L. Pittenger, University of Minnesota; Melissa A. Bumgardner, University of Minnesota; Kristin K. Janke, University of Minnesota. Objectives: To assess learning from an online, undergraduate course on common prescription medications. To examine student response to the course structures. Methods: A pretest was designed to assess baseline knowledge of disease prevalence and symptoms, as well as basic mechanisms of action, side effects, and indications of commonly used medications for an online, undergraduate course offered during Fall 2005 and Spring 2006. Pre-designed, parallel (to the pretest) questions were embedded into four in-course exams. Overall performance (average correct score) was assessed between the pretest and in-course exam questions. Unique learning activities, such as analyzing direct-to-consumer advertisements, were included in each module. A course evaluation provided feedback on student response to the course structures. Results: Twenty-six (43%) of the 61 students enrolled in the Fall 2005 offering elected to participate in the study. The average score on the pretest was 51%, with an average post-test score of 86% (p < .0001, paired t-test). In Spring 2006, forty-seven (37%) of the 127 students participated with similar results (i.e. pretest average = 51%, in-course exam average = 89%, p < .0001, paired t-test). Student feedback indicated a relative dissatisfaction with the unique learning activities. In addition, students reported spending less time studying than University guidelines state; however overall performance for students was very good. Implications: Colleges of Pharmacy are uniquely qualified to provide pharmacy-related content to an undergraduate, non-pharmacy student audience. Future areas of
study include better utilization of unique course activities and evaluation of the influence of online delivery on learning efficiency.

Laying the Foundation for a Professional Culture: Utilizing a Two-Week New Student Orientation Program. Michelle R. Easton, University of Charleston; Richard E. Stull, University of Charleston; Evan T. Robinson, University of Charleston; David G. Bowyer, University of Charleston; David A. Latif, University of Charleston; Laura P. Welch, University of Charleston. Objectives: Describe and evaluate a required two-week new student orientation. Methods: A 1 credit hour, two-week new pharmacy student orientation was offered 2 weeks before the start of the academic year. The course covered: Professional Expectations, Involvement, and Organization, Technology Training, Initial Assessments, Overview of Experiential Education, preparation for the White Coat Ceremony. Course objectives were to provide a broad foundation of the general expectations of the profession and school of pharmacy, assist in the identification of the major parts of ethical dilemmas, and determine basic Top 200 drug, medical terminology, and HIPAA knowledge. Students participated in a professional organizational showcase and workshops designed to explore issues related to advocacy, citizenship, and activism. Each activity was designed to support the introduction of the professional culture sought within the School’s professionalization plan. Results: Students completed pre and post surveys for each activity and for the course. Surveys revealed two major themes - students felt well informed and prepared to meet the expectations of their first year and confirmed that being involved in the profession is an expectation of the program. Greater than 90% stated their experience with the orientation was “very satisfied” to “extremely satisfied”. Implications: A two-week new student orientation assisted the school in laying the foundation of a professional culture prior to the official start of the academic year. Future incorporation of pharmacy students will assist in the growth of the mentorship program, leadership development, the professional socialization process, and student engagement in the programmatic offerings of the School.

Modifying a Blood Pressure OSCE Station to Reduce Test Anxiety. Beth A. Martin, University of Wisconsin; Karen J. Kopacek, University of Wisconsin; Brian C. Erskine, William S. Middleton Memorial Veterans Hospital. The primary objective was to create and implement a multi-day blood pressure (BP) Objective Structured Clinical Exam (OSCE) to assess students’ ability to measure a BP and heart rate and to discuss tobacco use. The secondary objective was to provide a testing environment that reduced students’ anxiety and clinical instructor burden. All previous BP OSCE stations were held in conjunction with a designated Saturday OSCE exam. In 2006, eight OSCE scenarios were created to accommodate eight optional weekday test times for 126 second-year pharmacy students. Two-hour time blocks were designated and students signed-up for their preferred time. A scoring system was created that allowed for immediate student feedback (pass/fail) and remediation. Each scenario had 14-16 students participating. The average score received was 93.5% (range: 64%-100%). Eight students were required to remediate (score < 80%). There were no statistical differences in average scores between the eight scenarios (p = 0.904) nor between lab sections (p = 0.445). Sixty-five students reported a medium anxiety level on the weekday; 100 students reported they would have had high anxiety if the station had been on the Saturday OSCE date. Students liked the less stressful testing environment, clear expectations, and feedback provided. Least liked were inconsistent BP readings, not receiving preferred test time, and low confidence measuring a BP. The modified process reduced test anxiety and instructor burden. This format will be continued and expanded to other skills all pharmacy students should be able to demonstrate.

Multiple Rubric-Based Assessments of Student Case Presentations in Recitation. Catherine E. O’Brien, University of Connecticut; Amy M. Franks, University of Arkansas; Kimberly Dickey, The University of Utah; Cindy D. Stowe, University of Arkansas. Objectives: The study was conducted to compare multiple rubric-based assessments to instructor assessments of case presentations in the recitation component of a therapeutics course. Methods: During spring 2006, the standard method of grading in recitation was a single instructor assessment. A grading rubric was developed to evaluate 3 major areas of assessment: knowledge, skills, and professional attitude. Each item is described by 3 levels of performance. The rubric was used by instructors, student peers, and the student presenter to evaluate case presentations and compared to the standard method of grading. Results: The rubric was used to score 283 presentations. Each completed rubric was converted to a numerical composite score (maximum 100 points). The rubric-based instructor scores were significantly lower than those derived from the standard method (94.0 ± 5.7 versus 97.7 ± 4.9, respectively; p < 0.0001). Peer assessment scores were significantly higher than those from instructor or self-assessments (98.9 ± 3.7, 94.0 ± 5.7, and 94.4 ± 8.6, respectively; p < 0.0001), but there was no significant difference between instructor and self-assessments. When scores for knowledge, skills, and attitude were analyzed separately, instructor assessments were significantly lower for knowledge (17.2 ± 2.5 versus 17.9 ± 2.5 out of 20 points, P < 0.001) and higher for attitude (39.5 ± 1.6 versus 38.7 ± 3.4 out of 40 points, P < 0.001) than the self-assessments. Implications: The study demonstrates the successful use of multiple rubric-based assessments of student case presentations in recitation. The rubric scoring method better differentiated scores than the previous grading method. The rubric and multiple assessments were incorporated as the formal scoring method for presentations in the course in spring 2007.

One Region’s Collaborative Approach towards Improving Preceptor Development. Peter J. Tyczkowski, The University of Connecticut; Philip M. Hritiko, The University of Connecticut; Mary Ann Phaneuf, The University of Connecticut; Catherine Basile, Massachusetts College of Pharmacy and Health Sciences – Worcester; Ronald A. DeBellis, Massachusetts College of Pharmacy and Health Sciences – Worcester; Paul DiFranesco, Massachusetts College of Pharmacy & Health Sciences – Boston; Jayne Lepage, Massachusetts College of Pharmacy and Health Sciences – Worcester; Debra A. Copeland, Northeastern University; Samuel J. Matthews, Northeastern University; Lorelei Ventocilla, Northeastern University; Kathleen O. Fisher, University of Rhode Island; June T. Spink, University of Rhode Island. Objective: The success and quality of Advanced Pharmacy Practice Experiential Rotations (APPE) rely heavily on the skills of preceptors. While many preceptors are full-time faculty, a large portion of APPE’s are under the supervision of professionals serving in Adjunct appointments. Directors of Experiential Education are challenged to prepare and better develop preceptor skills. Recognizing similar needs and working creatively to overcome them, the five New England Pharmacy Schools, formed the “NERDEE” (New England Region Departments of Experiential Education) Group. In addition to working on a number of areas of mutual interest, one of NERDEE’s first objectives was to improve preceptor development. Methods: As a first collaboration, NERDEE sought to secure a block of time during the New England Pharmacist’s
Consortium (NEPC), scheduled for late September of 2006. The NEPC was chosen for 2 reasons: its large attendance by pharmacists practicing in diverse settings; and it offers a “Residency Showcase” for residency programs in the region. A speaker with national recognition was secured for the presentation. The continuing education program (CE) entitled “Tips on how to evaluate students and staff” was delivered. Results: The presentation was scheduled concurrently with another CE topic but did not conflict with times preceptors would likely be engaged in the residency showcase or exhibit hall. Program attendance exceeded 95 preceptors and received very favorable ratings. Implications: This program has precipitated the planning of additional preceptor development programs to be held at other regional pharmacy professional meetings.

**Perceptions and Incidence of Academic Dishonesty.** Amy S. Peak, Butler University; Ayesha Kherei, Butler University. Objectives: To elucidate faculty and student perceptions of academic dishonesty, determine if perceptions differ between students and faculty, ascertain the incidence of various types of academically dishonest behaviors, reveal what factors correlate with academic dishonesty and determine if academic integrity differs between pharmacy students and non-pharmacy students. Methods: A voluntary, anonymous electronic survey was distributed to students and faculty. Those participating could register to win one of three $50 Visa gift cards. Results: The survey was completed by 129 faculty members and 897 students, 28% of which were pharmacy or physician-assistant students. There were statistically significant differences between what faculty and students perceived as being academically dishonest. The vast majority of students (82%) admitted to asking other students who had already completed a quiz/exam for information regarding the exam. Most students (56%) indicated they have worked in groups on items that were clearly intended to be individual assignments. Many students (42%) admit to altering laboratory data to yield more desirable results, with more pharmacy/PA students admitting to such alterations (52%) compared to non-health-sciences students (30%). Twenty-eight percent admitted to viewing other students’ answers during examinations. Students in social fraternities/sororities or collegiate athletics were significantly more likely, while married students were significantly less likely to engage in acts of academic dishonesty. Students in the education and fine arts disciplines were less likely to be academically dishonest compared to those in health sciences and business. Implications: Academic dishonesty is a common problem in higher education, including pharmacy education.

**Pharmacy Students as Assessors of Pharmacies Progress toward USP Chapter <797> Compliance.** Ann M. Wicker, The University of Louisiana at Monroe, Roxie L. Stewart, The University of Louisiana at Monroe; Scott A. Baggarly, The University of Louisiana at Monroe. Objectives: The United States Pharmacopeia (USP) Chapter <797> sets practice standards for personnel training, microbial contamination risk levels, and aseptic manipulation skills to help ensure that sterile preparations are of the highest quality. The purpose of this study was for pharmacy students enrolled in the College’s Hospital Pharmacy elective to recognize and assess compliance of required sterile preparation by pharmacies. Methods: A three page survey document was created by the authors to measure the impact of Chapter <797> standards on pharmacies. The survey was field tested by three hospital pharmacy managers. Assessors were instructed on the goals of Chapter <797> and the application of the survey. Results: Thirty three (33) pharmacies were visited and assessed in Louisiana (31), Mississippi (1), and Arkansas (1). The survey’s results included, but were not limited to the following: (a) all pharmacies were aware of USP Chapter <797> compliance; (b) 85% of the pharmacies needed renovations to meet standards; (c) 76% estimated the total cost of renovations to be greater than $10,000; (d) 94% test their staff on theory of sterile preparations, and (e) 79% test on practical evaluation of aseptic technique using growth media. Conclusion: Student participation as assessors of USP Chapter <797> compliance provided on site knowledge and participation in the ever advancing professional standards required of pharmacists and pharmacies.

**Pharmacy Pre-matriculation Observational Experience.** Jeffrey T. Copeland, University of the Incarnate Word. Objectives: This study proposed to identify and evaluate the activities observed, information learned, level of understanding of a pharmacist’s role, and the impact, value, and length of the experience. Methods: Data were collected and analyzed from anonymous questionnaires distributed to potential pharmacy students using written responses and a five-point Likert scale. SPSS software produced descriptive analysis. Results: Fifty-two potential pharmacy students participated. The most prevalent observed clinical activities: patient interaction/counseling (36), OTC advice (3) and observed technical activities: dispensing (42), compounding (13), inventory control (9), third party administration (7). The most prevalent beneficial observed activities: counseling (20), dispensing (7), compounding (6) and least beneficial observed activities: non-beneficial activity observed (15), computer entry (5), counting medications (5). The most prevalent information learned: drug information (13), dispensing functions (11), patient interaction (8). 27% entered the observation with a moderate to high or high understanding of the pharmacist’s role while 5.8% had no prior understanding. All indicated a moderate to high or high understanding following the experience. No participants decided to avoid a pharmacy career. The experience had a moderate to significant or significant impact (96.2%) on continuing to pursue pharmacy. The experience value was rated moderate to high (94.2%). The experience length was appropriate (57.7%), too long (28.9%), or too short (13.4%). Implications: The experience is beneficial in increasing knowledge and understanding, creating a positive impact, and ensuring pharmacy exposure. The 80 hour experience will continue as a requirement.

**Pharmacy Students’ Self-efficacy and Intentions toward Working in Interprofessional Teams and With Underserved Populations.** Devra K. Dang, The University of Connecticut; Philip M. Hritcko, The University of Connecticut; Andrea R. Fuhrle-Forbis, The University of Connecticut; Ann A. O’Connell, The University of Connecticut; Petra Clark-Dufner, Connecticut Area Health Education Center; Catherine Russell, Eastern Connecticut Area Health Education Center; Debbie Becker, Eastern Connecticut Area Health Education Center; Bruce E. Gould, The University of Connecticut. Objectives: The new ACPE standards stipulate that interprofessional teamwork, cultural competency, and health disparities be addressed in pharmacy curriculum. Prior to initiating an interprofessional service-learning program, we examined pharmacy students’ baseline perceptions of interprofessional teamwork, empathy toward patients, and intentions to work with underserved populations. Pharmacy students were compared to other health professional students. Methods: Students from pharmacy, medicine, dentistry, nursing, and physician’s assistant programs completed anonymous surveys at the beginning of the Fall 2006 semester. Students were asked about their knowledge, attitudes, and self-efficacy toward interprofessional work, and intentions for working in interprofessional teams and with underserved populations. They also completed the student version of the Jefferson Scale of American Journal of Pharmaceutical Education 2007; 71 (3) Article 60.
Physician Empathy. **Results:** 499 students completed the survey, including 92 pharmacy students in their third professional year. Pharmacy students reported lower self-efficacy toward interprofessional collaboration (compared to medical, dental, and physician assistant students), less willingness to work in interprofessional teams (compared to medical students), and less empathy (compared to medical, nursing, and physician assistant students). They also reported less willingness to work with underserved populations or to provide services to those who cannot pay for them compared to all other students. All comparisons were statistically significant at p < .01 based on Tukey pairwise comparisons. **Implications:** Pharmacy students may be less aware of the role of their profession in interprofessional teams and with underserved populations than other health professional students. Providing opportunities to engage in interprofessional collaboration and provide care to underserved patients may foster positive self-efficacy and intentions toward these types of work.

**Predictors for Admission and Academic Performance at the University of Nebraska Medical Center (UNMC) College of Pharmacy.** Timothy R. McGuire, University of Nebraska; Donald G. Klepser, University of Nebraska; Peter R. Gwilt, University of Nebraska; Thomas Birk, University of Nebraska; Charles H. Kroboth, University of Nebraska; Edward B. Roche, University of Nebraska.

**Background:** Predictors for admission to and performance in the UNMC College of Pharmacy at UNMC is valuable to refining the admission process and counseling unsuccessful applicants to improve the likelihood of admission on re-application. The current admissions process uses an Admissions Committee Scoring System (ACS) that measures performance in 5 domains including a questionnaire, an essay, academic confidence, evaluation letters, and work and extra-curricular activities. **Methods:** Demographic and pre-pharmacy academic data was collected on 586 students who applied to the College between the years 1999-2002. A multivariate logistic regression model was used to determine significant predictors for admission and multiple linear regression to model significant predictors of academic performance in those students admitted to the College. The outcome measure for academic performance for admitted students was average grade point average (gpa) during the first three years of coursework in the College. **Results:** Predictors for successful admission into the College included ACS (odds ratio = 10.0; p < 0.0001) and interview score (odds ratio = 1.4; p < 0.0001). Predictors for academic performance included gender (male: parameter estimate = −0.100; p = 0.061), admissions gpa (parameter estimate = 0.51; p < 0.001), referral from a University as opposed to a 4 year college or community college (parameter estimate = 0.098; p = 0.031), and ACS (parameter estimate = 0.327; p < 0.001). **Conclusion:** Re-applicants to the College can be counseled that strengthening non-gpa domains of the ACS will improve their chances of admission. GPA is often difficult to change over the short-term because of the heavy weighting of prior coursework. The profile of the student who has strong academic performance in the College is a University educated student with high pre-pharmacy gpa and high ACS. Future work will utilize these covariates to investigate how well they predict the gpa of 2007-2008 graduates during their first three years of coursework and will allow the us to determine the predictive value of this model.

**Primary Care Nutrition - Evaluation of an Elective Course.** Linda F. Chang, University of Illinois at Chicago; Cherdaksak Iramaneerat, University of Illinois at Chicago; Everett V. Smith, Jr, University of Illinois at Chicago; Nicholas G. Popovich, University of Illinois at Chicago. **Purpose:** To evaluate the association of course participation with changes in student self-efficacy, i.e., to determine whether students’ self-efficacy for their abilities to practice primary care nutrition improved after completing the course. The overarching goals of this class were to: 1) expand and strengthen primary clinical nutrition instruction, 2) enhance students’ communication abilities, critical thinking skills, and interpersonal skills through collaborative teamwork, and 3) increase students’ confidence in applying nutrition knowledge and using performance-based skills to effect achieve ultimately positive patient outcomes. **Methods:** The course featured problem-based learning strategies, e.g., small group, multimedia examples, debate formats. A retrospective pre-post questionnaire assessed student self efficacy upon completion of the course. The Rasch rating scale model was used to evaluate the data provided by the assessment instrument to ensure that the items measured the same construct (i.e., possessed unidimensionality) and produced additivity of measures (i.e., true interval level data) when the data fit the model. **Results:** Statistical analysis demonstrated that 23/25 students demonstrated statistically significant improvement in their self efficacy after completing the course, i.e., to practice primary care nutrition. In addition, a majority of the students strongly agreed that the course increased their ability and confidence in dealing with primary care nutrition in pharmacy practice. **Discussion:** The results of this study revealed that the teaching formats utilized in the course were effective in accomplishing course goals and objectives. Longitudinally, the retention and usefulness of acquired knowledge and skills in the students’ future practice settings will need to be assessed.

**Putting OTC Knowledge Into Practice: Incorporating an Introductory Pharmacy Practice Experience in a Self-Care Course.** Renu F. Singh, University of California, San Diego; Candis M. Morello, University of California, San Diego; Brookie M. Best, University of California, San Diego. **Objectives:** This project aimed to: (1) Develop an Introductory Pharmacy Practice Experience (IPPE) in self-care management within a first year non-prescription Pharmacy Practice course, (2) Assess student preparedness to assist patients with self-care therapy, (3) Determine patients’ perceptions of the value of the student service. **Methods:** After completing six weeks of self-care coursework, fifty-eight first year students attended seven community pharmacies in two-hour blocks over two weeks. Students assisted patients with self-care issues in several over-the-counter (OTC) aisles, providing OTC drug and non-drug recommendations as appropriate. Pharmacist preceptors evaluated the students’ performance using competencies based on CAPE outcomes and California Board of Pharmacy internship requirements modified for an OTC focus. Students subsequently completed a survey assessing their perception of their preparedness for the IPPE and the value of the experience. Patients who interacted with a student completed a survey to rate their perception of the usefulness of the advice given. **Outcomes:** All students successfully met the competency requirements for the IPPE. Twenty-nine of 37 (78%) students who completed post-IPPE surveys felt prepared based on the coursework covered to-date, and desired future similar IPPEs. Thirty-three of 34 (97%) patients felt that students provided valuable information, and 31/33 (94%) stated that students helped them with product selection. **Implications:** This IPPE enabled first year students with 6 weeks of self-care coursework to confidently assist patients in the OTC aisles of community pharmacies. Future IPPEs within this course will aim to coincide with times of maximum patient activity in the pharmacies.

**Special Needs Population Interactions: Survey of Student’s Attitudes and Skills.** Carnita Coleman, University of the Incarnate Word; Renee A. Bellanger, University of the Incarnate Word.
Objective: Pharmacy students must become competent in interacting and communicating with persons of differing levels of cognition and ability. This study will assess students’ attitudes and skills developed regarding interacting with special needs populations. Methods: A survey designed to assess attitudes and skills improvement in interactions with special needs persons was given to students at the end of their first semester of P1 year. The investigators wanted to ascertain the student’s attitudes and self-perception of skills related to two imbedded assignments in the course that dealt with communicating with special needs adults and children. After didactic instruction regarding learning styles and teaching strategies, student teams were assigned to visit a pre-arranged site to complete a project with a group of special needs children. Students also chose a drug from Top 50 drugs list and created an informational page describing this drug for a patient with a visual learning preference. Results: Based on a likert-type scale, a majority of students reported an increase in knowledge through the development of drug information for a visual learner. Students also reported an increase in skills and empathy for patients with special needs. Conclusions: The survey will help the researchers to modify teaching modalities, assignments and assessments for this subject matter to better prepare students for the eventuality of interacting with special needs patients. The course enables students to put into practice the skills obtained for interaction with special needs patients. The survey helped students reflect on the appropriate attitudes necessary for providing care to patient with special needs.

Spirituality in the Curriculum: Impact on Pharmacy Students’ Attitudes. Brian T. Cryder, Midwestern University – Chicago; Gloria M. Workman, Midwestern University – Chicago; Michelle M. Lee, Midwestern University – Chicago; Don E. Workman, Northwestern University, Frank J. Prerost, Midwestern University – Chicago. Objective: The purpose of this study was to assess the impact of instruction on concepts of spirituality among pharmacy students. A second aim was to examine the beliefs and attitudes of pharmacy students regarding spirituality and religion, and their relevance to pharmacy practice. Method: Students enrolled in a Spirituality and Health course were approached to participate in this study. Interested participants were administered a pretest survey at the beginning of the course to assess their attitudes and beliefs regarding spirituality and pharmacy practice. Students were also asked to complete the same questionnaire at the end of the 10-week course. Thirty-one students completed pretest and posttest questionnaires. Results: Students rated the importance of asking patients about their spiritual needs; how comfortable, knowledgeable and competent they would be discussing this topic with patients; and how likely they would be to implement a spiritual assessment in pharmacy practice. Paired-samples t-tests revealed a significantly greater willingness to address patients’ spiritual concerns in the clinical encounter on all aforementioned domains following course completion (all p values < 0.01). While preliminary, these findings suggest that teaching approach is one way to incorporate spiritual training into existing curricula. Such approaches may be helpful to training programs that are hoping to improve students’ understanding of the importance of religious and spiritual issues in patients’ lives. Implications: Knowledge gained from this study can help educators and institutions develop improved curricula in order to train pharmacy students to ethically and positively integrate spirituality issues into future patient care.

Standardizing Learning Activities to Enhance Learning and Administrative Efficiency in Academic Pharmacy Rotations. Todd D. Sorensen, University of Minnesota; Kristin K. Janke, University of Minnesota. Objective: To design methods for enhancing learning and controlling faculty workload in two academic-based advanced pharmacy practice experiences. Process: Three methods were developed and implemented in two academic-based rotations. First, online modules were designed to assist students in preparing for the rotations’ learning activities, such as manuscript peer review and lecture preparation. Second, five discussion outlines, reviewing the objectives, questions to be asked and data to be presented, were created for regular preceptor-student discussion topics, such as organization of the college and faculty responsibilities. Third, required weekly reflection exercises were designed to assist students in processing their experiences and providing feedback to the preceptor. Outcomes: Over 40 students have participated in two academic-based rotations over the last four years. With preparation materials available online, faculty spend less time repeating instructions to each rotation student, a higher level of quality is received on first drafts of materials and students begin to hone the self directed learning skills required in practice. Discussion outlines allow for consistency between rotations and shared distribution of discussions across multiple faculty. The reflections reinforce an important skill for life long learning, as well as assisting faculty in understanding the value students place on the various learning activities. Feedback from learners suggests that these standardized activities have enhanced learning and contributed to increased satisfaction with the rotations. Implications: By standardizing preparation materials, discussion outlines and processes, such as reflective activities, faculty can share responsibilities with other faculty and create consistency and quality in academic rotations for pharmacy students.

Stimulating Communication and Changing Health Care Culture Through Interprofessional Education. Lynne T. Tomasa, The University of Arizona; John E. Murphy, The University of Arizona; Andreas A. Theodorou, The University of Arizona; Nancy B. Coleman, The University of Arizona. Introduction: The IOM report published in 2002 suggested the need to work in interdisciplinary teams for the improvement of healthcare. Cooperation, collaboration, and communication are necessary components of effective teams. As part of a revised medical curriculum, interprofessional education (IPE) opportunities for the health sciences colleges were developed in the Fall of 2006. Purpose: In order to move away from student learning in independent silos, the global objectives were to improve teamwork and enhance team-based communication skills. Specific objectives for classes on healthcare culture and team communication were designed to address professional role stereotypes and to learn communication strategies that can enhance teamwork. Methods: Approximately 300 students from medicine, nursing, pharmacy and social work met on two separate half days in a large ballroom where mixed groups were assigned to either the culture or communication class. Students switched and participated in the alternate class on the second half day. Faculty from all colleges helped facilitate the small group exercises. A web-based evaluation survey was developed to analyze student perceptions of the programming. Results: Students reported increased knowledge about barriers to effective communication and teamwork and found the experience worthwhile. Ratings of the two class sessions varied by discipline and day of participation. Most important, students emphasized their desire for interprofessional clinical experiences. Discussion: Implementation of successful IPE activities requires collaboration at all planning stages and participation of faculty and students from all professions. Deans from the colleges need to help generate enthusiasm and support. An adequate budget is also necessary.
Student Assessment of a Hospice Advanced Practice Experience. Robert K. Sylvester, North Dakota State University; Wanda Kearney, North Dakota State University; Joanna M. Roberg, North Dakota State University; Karen Smithson, Hospice of the Red River Valley. **Objective:** To determine student satisfaction with a hospice advanced pharmacy experience. **Methods:** A hospice advanced practice experience has been an elective since 1996. Its goal is to provide students opportunities to increase understanding of hospice care and to assist in optimizing the pharmacotherapy of hospice patients. At the end of the 5-week experience, students are required to complete an evaluation. Items are rated on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). Students are also asked to comment on strengths and weaknesses of the site and to make suggestions for its improvement. A reflective journal addressing professional, emotional, and spiritual growth is required. Evaluations and journals for the past 2 years were analyzed to determine student comment on strengths and weaknesses of the site and to make suggestions for its improvement. A reflective journal addressing professional, emotional, and spiritual growth is required. Evaluations and journals for the past 2 years were analyzed to determine student satisfaction. **Results:** Overall, mean Likert scores from 18 evaluations documented student satisfaction (range 4.6 to 4.9). The lowest ranking (4.6) was on the amount of time allowed to complete assigned tasks. Provision of sufficient resources and opportunities for patient care scored 4.7. Highest (4.9) were evaluations of work environment and of student willingness to recommend the rotation. Student comments in the evaluations and journals were consistently positive. **Implications:** An anticipated increase in the need for end-of-life care has led to a greater acceptance of hospice organizations and the pharmacist’s role therein. Hospice organizations can provide rich environments for student growth.

Student Knowledge Acquisition in an Online Pharmacotherapy Course for Health Professional Students. Melissa A. Bumgardner, University of Minnesota; Amy L. Pittenger, University of Minnesota; Kristin K. Janke, University of Minnesota. **Objectives:** To assess knowledge acquisition in an online pharmacotherapy course for health professions students. **Methods:** A pre-test was administered to Fall 2006 nursing, respiratory care and other health professions students to assess baseline knowledge of disease prevalence and symptoms, and basic mechanism of action, primary side effects, and indications of commonly used medication classes. Parallel and content matched (to the pretest) questions were embedded into the final. Knowledge acquisition was assessed by comparing average correct score between the pretest and final exam questions. Analysis of question subsets was performed to identify content areas of relative mastery and those of difficulty. The course entrance survey and evaluation provided details on prior familiarity with content areas and perceived retention of pharmacotherapy knowledge. **Results:** The average score on the pretest was 39.6%, with an average post-test score of 68.1% ([p < .0001, paired t-test]. Question subset analysis revealed that the area of greatest prior knowledge was dietary supplements. Areas of relative mastery were autonomic nervous system, general principles of pharmacotherapy, antineoplastics and cardiovascular with remaining difficulties in central nervous system and inflammation. Eighty-five percent of students had little or no baseline pharmacotherapy knowledge. At the end of the course, 58% of the students felt confident or very confident in applying their knowledge to patient care and 85% were neutral or satisfied with their knowledge retention. **Implications:** Measures of baseline pharmacotherapy knowledge, combined with entrance and exit survey data, can assist in understanding the extent of knowledge acquisition and areas of continued instructional need.

Student Peer Mentorship: Addressing Faculty Workloads Now and for the Future. Jeremy L. Thomas, University of Tennessee Health Science Center; Christa M. George, University of Tennessee Health Science Center; Andrea R. Franks, University of Tennessee Health Science Center; Raoul E. Arreola, University of Tennessee Health Science Center; L. Brian Cross, University of Tennessee Health Science Center. **Objectives:** In response to a growing class size and faculty time restraints, we implemented a teaching model that uses more advanced Pharm.D. students as teaching assistants. Second and third professional year students facilitate small group activities to the 200 first professional year students in Basic Clinical and Communications Skills Lab. The study objective was to determine if this teaching experience inspired pharmacy students to pursue careers in academia. **Methods:** Students who had served as group leaders were invited to participate in an anonymous computer based survey. **Results:** Seventy-six of 101 past teaching assistants completed the survey. Fifty-nine percent of respondents stated the teaching experience generated an interest in pursuing a career in academia. Of 36 students reporting no interest in academic pharmacy prior to the course, 44% stated the course caused them to become interested in a career in academia. Twenty-four students stated they will likely seek a career in academic pharmacy with 63% of those reporting their experience as a teaching assistant as a strong influence on that decision. **Implications:** With increasing faculty workloads and an ongoing faculty shortage, using more advanced students as teaching assistants can accommodate a larger class size while still providing active, hands-on learning. An added benefit is the potential to inspire and develop teaching skills in students who may consider academic pharmacy as a possible career path. The experience of teaching and leading a small group has generated an interest in academia for many students participating in the Basic Clinical and Communications Skills Lab.

Student Pharmacists’ Preferences for Various Types of Simulated Patients. Casey E. Gallimore, University of Minnesota; Michael C. Brown, University of Minnesota; Angela K. George, University of Minnesota. **Objective:** There is limited scholarship in pharmacy educational literature regarding students’ perceptions of the use of various persons (i.e., instructors, peers, volunteers, paid actors) as simulated patients. The objective of this survey was to evaluate student pharmacists’ preferences for various types of simulated patients. **Methods:** Second-year students participated in seven formative assessments that used simulated patients including volunteers, College staff, instructors, and peers. At year’s end, students ranked their preferences for each simulated patient type (1-4 with ties allowed). Students were also surveyed to explore perceived differences in believability and skill development using a 5-point Likert scale ranging from strongly disagree to strongly agree. **Results:** One-hundred seven of 155 students (69%) completed the survey. Students preferred community volunteers as simulated patients (mean rank 1.39), followed by peers (2.22), instructors (2.63), and staff (2.81) (p < 0.001). All patient types were routinely ranked as believable (median rating “agree” for all 4 types), but community volunteers were ranked more believable than the other three (p < 0.001). The majority of students (>82%) felt that any lack of believability did not detract from the learning experience. Greater than 89% agreed or strongly agreed that their work with simulated patients prepared them for actual patients, with community volunteers receiving the highest ratings (p < 0.03). **Conclusions:** Student pharmacists prefer community volunteers as simulated patients. While exclusive use of community volunteers is not logistically feasible, students’ preferences suggest their use should be maximized. Future scholarship should explore whether simulated patient types are associated with student performance.

Students’ Perceptions on Using Electronic Portfolios for Record Storage and Professional Advancement. David D. Trang, University
of Incarnate Word; Jodie Malhotra, University of Incarnate Word; Amy Witte, University of the Incarnate Word; David F. Maize, University of the Incarnate Word. Introduction: Electronic portfolios are well organized collections of electronic documents that demonstrate an individual’s skills, education, and professional development. RXportfolios® is an electronic portfolio uniquely customized for the pharmacy profession. Our purpose was to evaluate first-year pharmacy students’ knowledge and comfort with electronic portfolios.

Methods: Students completed questionnaires on electronic portfolios and other communication technologies. Two questionnaires were administered, one prior to a demonstration on RXportfolios® (17 questions) and a follow-up questionnaire after utilization of the portfolio (6 questions). The results of each question were analyzed using SPSS software. Results: Students reported an average-to-high knowledge and comfort level for using email (98.7%, 97.4%) or text messaging (81.6%, 84.2%), however, students reported poor-to-average knowledge and comfort level for using email (98.7%, 97.4%) or text messaging software.

Conclusion, the course team recommends a SNA as a useful tool for evaluating third-year students’ final course grades in an endocrinology module delivered across two campuses. In addition, compare the outcomes (individual exam scores, final course grades, and course evaluation results) of TBL to lecture methods used in previous years.

Methods: Thirteen, 3-part TBL sessions (learning objective-driven content pre-assignments; in-class (IRAT/TRAT) individual and team readiness assessment tests; team problem-solving of therapeutic cases and class discussion led by faculty facilitators) replaced all course lectures. Analysis included multivariate linear regression on scores from TBL activities, individual exams and team contribution scores (peer review, IRAT performance, faculty observation, and team contribution) to determine the impact on final grade. Student performance on individual exams and final grades were compared between TBL and lecture, since TBL used the same test format as the previous lecture-driven course. Evaluations of all TBL sessions and the overall course were obtained. Results: IRAT and team contribution scores significantly predicted final course grades (p < .001). Overall, course grade performance was improved using TBL compared to the traditional lecture methods used previously (no failing (D/F) grades occurred). The course structure appeared to most positively impact the academically weak students. While overall course ratings dropped using TBL, course evaluations revealed that students accepted the course format change. Discussion/Implications: This transformation suggests that students can acquire knowledge in a self-directed environment, apply that knowledge to common therapeutic scenarios, and successfully complete the course with their IRAT and team contribution scores as statistically significant predictors of their course grade.

The Need for Entrepreneurial Leadership in Pharmacy - A Review of Findings from two surveys. Renea J. Chesnut, Drake University; Denise A. Soltis, Drake University; Lauren Pedersen, Drake University. Objectives/Intent: Traditionally entrepreneurship in pharmacy has been viewed as owning an independent pharmacy,

Background: ACPE accreditation guidelines emphasize consistency in the assessment of pharmacy students, but factors influencing a preceptor’s assessment of performance are not well defined. Objectives of this study were to determine whether the knowledge of a student’s prior experiential training, a preceptor’s scope of practice, and/or other preceptor-specific factors influenced the assessment of pharmacy student performance. Methods: Three senior pharmacy students were videotaped interacting with standardized patients for the purpose of subsequent assessment during a development conference. Preceptors attending the conference were informed about a student’s prior experiential training prior to viewing each taped student-patient interaction, then assessed performance elements as well as overall numeric performance according to Likert-type scales. Preceptors also ranked how much their expectation for performance was influenced by knowledge of each student’s experiential training, and indicated whether each scenario was within their usual scope of practice. Results: Seventy-four preceptors evaluated student performance. The only significant factor in association to the overall numeric score assigned to student performance, for 2 of the 3 students evaluated, was the number of interns precepted by a pharmacist annually. Neither the knowledge of the student’s prior rotation experiential training, nor preceptor scopes of practice significantly influenced the overall assessment of student performance. Conclusions: Efforts to standardize the evaluation of pharmacy students should consider the potential influence of preceptor-related factors to promote consistency in assessment. Additional research is needed to delineate the scope and magnitude of factors influencing the assessment process and develop methods to promote consistency.

Use of Faux Medical Charts as a Tool to Prepare Students for Clinical Rotations. James D. Scott, Western University of Health Sciences; Michael E. McCrory, Western University of Health Sciences; Wallace J. Murray, Western University of Health Sciences. Introduction: The current standard at most schools of pharmacy to practice the application of the didactic information is to use a brief case summary as a springboard for case discussions and/or SOAP notes. However, case summaries do not offer the opportunity to learn how to review medical charts, which is how cases are presented during rotations and in practice. Model: Western University’s College of Pharmacy, Pomona, CA, utilizes a block system in the 2nd and 3rd years. The last block prior to rotations is used for curricular review and evaluation of content and skills. Four faux medical charts were created by 4th yr rotation students and edited by a faculty member. Two cases each were inpatient and outpatient, and were designed to present realistic, multi-disease state patients. Student teams were offered an opportunity to do a focused review of the chart, and then each student individually wrote a chart note based upon additional information provided by the course facilitator. Outcomes: Each student had an opportunity to write four chart notes, and each note was hand graded by the same faculty member (involving 40-45 hrs of overall grades). Overall grades improved from chart 1 through chart 3 (91%, 92%, 95%, p < 0.001) but decreased with chart 4, which involved a more complicated case (89%, p < 0.001 compared to charts 1-3). Future directions: Overall students found the exercises helpful and productive. Proper training of required chart note structure and a consistent rubric for grading is essential to ensure a productive learning exercise.

Use of a Peer-Review Activity in a Pharmaceutical Care Course. Stacy L. Haber, Midwestern University – Glendale; Lydia A. Nese-mann, Midwestern University – Glendale. Objectives: To develop, implement, and evaluate a peer-review activity in a pharmaceutical care course. Methods: In 2005, a peer-review activity was used for a drug information assignment in a pharmaceutical care course at Midwestern University College of Pharmacy-Glendale. All students enrolled in the course completed the assignment, which was formulation of a written response to one of nine drug information questions using tertiary resources. Three main outcomes were assessed: content of response, use of resources, and grammar/writing style. The assignments were scored, using a grading rubric and an answer key, by one instructor and one student, in a blinded manner, who answered the same question. A correlation was calculated to determine the relationship between scores assigned by instructors and students. Results: A total of 129 pharmacy students were enrolled in the course. Data were obtained for 127 of the assignments (two students did not attend class on the day the peer-review activity was conducted). A correlation of 4.3 was achieved. Approximately 71% of the students gave the assignment a higher score than the instructor; 19% gave a lower score than the instructor; 10% gave the same score. When students were asked if they valued the peer-review activity, a majority responded favorably. Implications: With a structured peer-review activity, a positive relationship can be achieved between scores assigned by instructors and students. Continued use is warranted and expansion into other courses/curricula can be considered; however, instructor oversight is needed.

Using a Professional Elective Course to Create Patient Care Opportunities for Community APPE Students and Preceptors. Jodie L. Bakus, Ferris State University. Objectives: To develop a unique elective course for P3 pharmacy students; to facilitate the implementation of patient care programs in community APPE sites.
Methods: A course proposal was submitted and approved by the college curriculum committee. Topics covered in the course through lecture and classroom activities included: program goals, interviewing skills, documentation, marketing, reimbursement, and quality assurance. Faculty and guest speakers provided wellness equipment demonstrations and interactive lectures. Students were divided into small groups and each group was paired with a P4 community site to develop a specific patient care service of the site’s choosing. Student assignments throughout the semester contributed to the development of the programs. In addition to email correspondence, students met with pharmacy preceptors on two occasions during the semester to discuss details of the patient care programs. At the end of the semester, students presented their programs to the preceptors. Results: Twelve third-year pharmacy students participated in the Winter 2006 course. Programs were developed for smoking cessation, medication management, cardiovascular wellness and weight management. Three of the programs were implemented in Spring 2006 and are currently offered at the respective P4 community sites. Eighteen students are currently enrolled for Winter 2007 and are developing additional programs for other sites. Implications: Many pharmacy schools struggle to provide community advanced pharmacy experiences that include a wide scope of patient care activities. Using an elective course, P3 students developed programs to enhance pharmacist-delivered patient care at currently used advanced community sites.

Using an Electronic Medical Record and Simulated Patients to Develop Critical Thinking and Documentation Skills. Jeanne E. Frenzel, North Dakota State University; Kimberly Vess Halbur, North Dakota State University. Objective: To assist third year professional pharmacy students in the longitudinal medical management of a simulated patient using SOAPware®, an electronic medical record. Methods: SOAPware® provides a platform for students to practice basic physical assessment. In addition, students are able to review patient medication histories; assess and render recommendations regarding a patient’s drug regimen; implement, modify, and manage drug therapy; and order and evaluate results of laboratory tests directly relating to drug therapy. Simulation and instructor feedback is used to assist students in developing documentation skills using the SOAP note format. Results: Students strongly believed that electronic medical records: (1) are advantageous over paper charts with regard to storage of patient data, ability to generate patient reports, and track patient outcomes; (2) provide opportunities for collaboration with other healthcare professionals; (3) are useful in documenting when a pharmacist provides patient care services; (4) allow pharmacists to expand the boundaries of their work beyond the traditional role of dispensing and counseling; and, (5) are user friendly. Conclusion: Activity performance, student satisfaction, and positive evaluations provided evidence that using an electronic medical record to longitudinally follow a patient through a series of simulated physician visits is practical, feasible, and desirable. College of Pharmacy, Nursing, and Allied Sciences North Dakota State University Fargo, North Dakota February 16, 2007.

Theoretical Models

Developing and Exercising a Hospital Preparedness Plan for Pandemic Influenza. Jeffrey P. Bratberg, University of Rhode Island; Wesley R. Zemrak, University of Rhode Island. Objective: To interactively and transparently develop an evidence-based, practical, and ethical hospital preparedness plan using an innovative project management website, and to create a tabletop exercise to demonstrate and evaluate the plan for regional stakeholders. Methods: Students will be divided into eight groups of 2-4 students to develop a specific aspect of a hospital preparedness plan using recent regional health-system plans and national guidelines for inspiration. Sections include education, administration, surveillance, logistics, admissions/triage, occupational antivirals and vaccines, patient antivirals and vaccines, and surge capacity. Students will be evaluated based on group participation, clinical decision making, designing the plan based on predetermined hospital characteristics, and anonymous peer-review. Innovative components of this plan include the use of web-based project management software in which students can conduct all work and continuously monitor project progress, post and update files, and communicate to all members of their group and/or class. Results: Each group will justify the essential health care tasks and resources required in both pre-pandemic and pandemic situations. At the end of the semester, each groups’ section will be compiled into a hospital-wide plan that will be tested in a mock pandemic tabletop exercise written and evaluated by the students as a whole. Implications: This project will increase the students’ knowledge of public health pharmacy through interactive, applied, service-oriented learning using technology optimal for pandemic planners. This project will also prepare these future health professionals for service in before and during influenza pandemic in command, planning, operational, and logistical roles.

Enhancing Community Pharmacy Practice Through a Novel Intensive Community Care APPE Program. Joan L. Settlemyer, The University of North Carolina at Chapel Hill; Michael Gabriel, The University of North Carolina at Chapel Hill; Stefanie P. Ferreri, The University of North Carolina at Chapel Hill; Alissa M. Smith, The University of North Carolina at Chapel Hill. Introduction: The scope of community pharmacy practice has advanced with the advent of Medication Therapy Management (MTM) services and collaborative practice agreements. Accreditation standards emphasize the need for students to focus on the provision of patient-centered and population-based care in both institutional and community settings. While opportunities currently exist for UNC students to intensively focus on the development of these skills in institutional and ambulatory care settings, opportunities are limited for an equivalent experience in the community setting. Methods: Faculty identified a rigorous series of interprofessional experiences that would develop skills in patient-focused care, wellness and disease prevention, public health, and the business aspects of community pharmacy. Once this group of advanced practice pharmacy experiences was identified, goals, objectives, and activities were developed. Results: This coordinated year-long structured experience is designed to provide students with evidence-based, patient- and community-centered practice models that are fiscally viable. Rising PY4 students were introduced to this program in the fall 2006 and students applied for the pilot program scheduled to begin fall 2007. Two students were selected to participate in this innovative community pharmacy APPE. Implications: After completing this program, students will be able to assume entrepreneurial and advanced practice roles in the community pharmacy environment. These future community pharmacy practitioners will be able to provide evidence-based, patient-centered care which will improve patient outcomes and reduce healthcare expenditures. It is anticipated that this type of practice will eventually become the standard of care for community pharmacy in North Carolina.

Implementation of a Capstone Pharmacy Course in a Distance Education Environment. Lisa D. Inge, University of Florida; Kelly L. Scolaro, University of Florida; Renee L. Rose, University of Florida;
Jennifer S Williams, University of Florida; Erin L St. Onge, University of Florida; Carol Anne Motycka, University of Florida; Benjamin J. Epstein, University of Florida; John G. Guns, University of Florida. Objective: To describe initiation of a capstone therapeutics course in a distance education environment. Methods: Pharmacotherapy VI (PTX VI) is a fourth year course administered in the last 8 weeks of the curriculum. The course is student-directed with pre-assigned presentation topics. Student teams of 2 or 3 are assigned a disease topic prior to starting their advanced pharmacy practice experiences. During rotations each team identifies a pertinent patient case. The case is utilized to support an evidence-based pharmacotherapeutic class presentation upon their return from rotations. Peer teams are assigned as questioners as are faculty content experts. In 2006 we were challenged with initiating this course to 3 distance campuses.

Results: This course was launched at the distance sites in a manner different than previous courses. Each campus had its own course coordinator who revised their syllabi to meet individual campus needs while maintaining the original course objectives. The campus directors and their assistant directors were responsible for course organization, serving as content experts, and student team assessment. Expert facilitator-faculty were hired to assist with questioning and grading. Data from 13 items on the course evaluation, submitted by 144 students, was assessed. Based on the evaluation scale (1-5), the students felt the course was highly valuable (4.20 ± 1.17), including meeting the course objectives (4.34 ± 1.04) on a 5 point scale.

Implications: This course, although presented with slight modifications on all 4 campuses, was able to achieve the overall goal of incorporating classroom knowledge, presentations skills, and experiential learning.

Longitudinal Care: An Introductory Pharmacy Practice Experience at the University of Puerto Rico. Edna Almodovar, University of Puerto Rico; Iadelisse Cruz-Gonzalez, University of Puerto Rico. Objective: To describe the design and implementation of a longitudinal introductory pharmacy practice experience (IPPE) during 2nd and 3rd professional years of an ability based program. Methods: P2 and P3 students during their second and first semester respectively, are assigned to diverse clinical settings (community pharmacy, geriatric primary care clinic, mental health clinic, and home based primary care). Throughout the practicum, students provide longitudinal care to a patient. Each patient care encounter takes place under direct supervision of the assigned faculty preceptor. During each semester, students complete 24 hours of practical experience and 12 hours of classroom sessions with small group discussions. Activities performed include, patient encounters, documentation of patients’ databases and health status reports, development of care plans, follow-up evaluations, reflections, and case presentations. Results: This IPPE provides an adequate setting for a longitudinal care experience. This is supported by means of multiple feedback opportunities (small group discussions, patients and caregivers’ evaluations, evaluation of documentation, and professionalism) and by direct interactions with patients, caregivers, pharmacists and other healthcare providers. Student and faculty evaluations for the last four years describe the experience as positive, integrative and very helpful in the development of professional abilities. Implications: According to faculty preceptors, students written course evaluations and patients’ evaluations of the students, the implementation of this IPPE has been successful. It has proven to be an effective way to integrate pharmacy practice concepts early in the program, fostering the development of the abilities.

Online Nontraditional Doctor of Pharmacy Degree Program Educational Project Rotation: A Unique Advanced Pharmacy Practice Experience. Diane L. Casdorph, University of Colorado at Denver and Health Sciences Center. Objective: Students in online Nontraditional Doctor of Pharmacy (NTPD) Degree Programs oftentimes are interested in pursuing a career in academia. Many of these students reside in rural areas and are unable to visit academic settings to receive instruction during their advanced pharmacy practice experiences (APPE). An online Educational Project rotation was developed for the University of Colorado (CU) NTPD program to provide an opportunity for students to experience academia under the guidance of a faculty preceptor. Methods: The online Educational Project rotation is available to students in the NTPD program having completed four required ADSM courses and Instructional Methods. Students are accepted on a full-time (200 hours completed over 5 weeks) or part-time (200 hours completed over a semester) basis. Initially, the student writes goals and learning objectives for the rotation. This is the beginning of the teaching portfolio showcasing the student’s accomplishments during the rotation. Relevant CAPE outcomes are identified by the student to develop the assessment tool. Literature and Internet evaluation of educationally related publications and websites is an integral component. The student participates in didactic online courses by grading, mentoring, and facilitating threaded discussions. Development of an educational module is the rotation’s capstone project. It includes an outline, learning objectives, readings, PowerPoint slides with audio, a threaded discussion, and assessment and instructor evaluation tools. Implications: Schools/Colleges of Pharmacy struggle to recruit qualified faculty. The NTPD online educational rotation offers students the opportunity to explore a potential academic career at a distance.

Peer Mentoring as a Component of Experiential Education. Michael B. Doherty, University of Cincinnati; Andrea L. Wall, University of Cincinnati. Objectives: The University of Cincinnati College of Pharmacy experiential curriculum has been developed to provide education and training during all four years. The second professional year introductory experience is year-long and pairs second with fourth professional year students. To effectively serve as mentors and role models to early professional pharmacy students, a structured mentoring workshop was necessary to train fourth professional year students. Methods: A mentoring workshop was developed and provided to fourth professional year students. The workshop occurred after students had completed three full-time rotations to allow for reflection on personal experiences that were incorporated into workshop sessions. Results: The half-day mentoring workshop consisted of large and small group discussions focusing on key areas associated with being an effective mentor and role model. Activities were conducted to help students identify their interpersonal communication style and techniques to effectively communicate with other styles. Interactive sessions on creating realistic expectations for learning experiences using students’ personal experiences, and exercises demonstrating difficulties in communicating information were performed. Discussions centered on positive and negative characteristics of role models, techniques for motivating students, and dealing with difficult situations involving student performance. Finally, a session focused on the importance and techniques for providing effective feedback and meaningful evaluation to peers and preceptors. Implications: The mentoring workshop serves as a foundation for future pharmacists to play a more influential role in mentoring pharmacy interns and technicians. It also provides students the foundation to be more effective contributors to the health care team and lifelong learners.

Start Slow, Go Slow: Moving Content Online Leaving Room for Discussion. Beth E. Welch, Massachusetts College of Pharmacy and Health Sciences – Boston; Kathy Grams, Massachusetts College of
Stepping out of Academia and Into a Disaster; Veterinary Pharmacist Role in the Hurricane Katrina Response. W. Elaine Lust, Creighton University. Objectives: To report a pharmacist/faculty member contribution to a Veterinary Medical Assistance Team (VMAT) at the establishment of a field veterinary hospital and pharmacy to treat rescued animals from Hurricane Katrina. VMAT’s are federally sponsored, highly trained teams available to provide veterinary medical treatment and address public health issues resulting from disasters. Methods: In September 2005, VMAT was tasked to provide veterinary medical treatment for animals rescued from New Orleans and surrounding areas following Hurricane Katrina. The VMAT team utilized horse stalls to set up the field hospital and pharmacy. The pharmacist was responsible for pharmaceuticals and central supply support to care for an estimated 3000 animals. Knowledge of veterinary drugs, disease states and conditions was required. The pharmacist supplied drug information and dosages to veterinarians; prepared oral, topical and injectable dosage forms; administered drugs to animal patients, assisted with animal triaging and physical assessments, and maintained a running inventory of controlled substances for pain control and euthanasia. Results: Resourcefulness, creativity, flexibility and adaptability were required elements to care for rescued or abandoned animals in the Hurricane’s aftermath. The experience was a stark contrast to the highly structured, autonomous environment of academia. Conclusions: A veterinary pharmacist must be very knowledgeable in veterinary drugs and disease states to support the needs of a veterinary medical team. Skill sets routinely used in academia such as multitasking, emotional intelligence, communication and flexibility were also required to help provide best patient care in conditions of extreme physical and emotional stress.

Symbiosis: Building Interprofessional Community Partnerships to Advance HIV/AIDS Education and Awareness. Michelle Akcar, University of Washington; Luis Ramos, University of Washington; Nanci L. Murphy, University of Washington. Objective: To collaborate with community organizations and interprofessional student partners to develop a series of participatory opportunities engaging students in HIV education, prevention, treatment, and patient support roles. Process: After forming new partnerships, we sponsored a series of HIV-related activities connecting pharmacy students with other graduate students and community organizations. Through this collaboration we were able to develop and host an interprofessional panel discussion on HIV patient care, a workshop on ethical decision making and HIV care, and a campus-wide World AIDS Day resource fair. Outcomes: More than 300 graduate, professional, and pre-health professional students participated in events created by interprofessional teams of pharmacy, nursing, medical, and public health students. Event participants completed pre- and post-session evaluations that identified improvements in *Personal interest in HIV/AIDS care, *Understanding of interprofessional roles within HIV/AIDS care, *Patient care ideas appropriate for current/future practice settings, and *Ability to analyze and apply ethical decision-making principles in complex HIV/AIDS patient cases. Planning team members also developed expanded awareness of the depth and breadth of HIV-related resources in the Seattle area through their work with more than 20 community and university-related organizations. Implications: Pharmacy students may feel overwhelmed at the thought of developing new interprofessional learning opportunities. Working symbiotically with established organizations fosters new student-mentor relationships and access to expanded resource networks. Learning points and partnerships from this HIV outreach series will help guide development of future interprofessional patient care projects.

Work in Progress

A Pharmacy Student Based Coronary Heart Disease (CHD) Risk Assessment Service in the Ambulatory Care Setting-Patient and Student Outcomes. Gina Garrison, Albany College of Pharmacy; Aimee F. Strang, Albany College of Pharmacy, Shannon Rivers, Albany College of Pharmacy; Teresa J. Lubowski, Albany College of Pharmacy. Objectives: The purpose of this study was to assess the value of a student-conducted patient education service focused on increasing patient awareness of Coronary Heart Disease (CHD) risk. Methods: D. students enrolled patients as part of usual patient-care activities during an assigned 5-week ambulatory care clerkship at 3 faculty practice sites. The study was IRB-approved. Faculty trained students on study procedure before patient enrollment. Students invited clinic patients to participate in a demonstration of personal CHD risk using patient-specific data from the medical record. The service included the utilization of a CHD risk software program which demonstrated the effects of change in modifiable risk factors and the resulting change in CHD risk. Patient outcomes were assessed using a satisfaction survey. Student outcomes were assessed using a pre and post CHD knowledge test. Results: 48 students educated 233 patients on CHD risk. The average student score on 5 CHD risk knowledge questions was 70.41 + 3.9 and 78.75 + 12.7, pre and post study involvement. A total of 229 patients completed the satisfaction survey. 95% of patients reported the service as helpful in understanding CHD risk. 46% of the patients learned of a new CHD risk factor as a result of the service. 63% of patients rated the service as very useful. 97% of patients reported the service as helpful in understanding CHD risk. 46% of the patients learned of a new CHD risk factor as a result of the service. 63% of patients rated the service as very useful. 97% of patients would recommend the service to a friend or family member. Implications: A student-conducted CHD risk service was beneficial as an educational opportunity for both students and patients.
A Comparison of Student and Preceptor Assessments of Professionalism and Competencies in P4 Rotations (APPEs). Beverly A. Talluto, Virginia Commonwealth University; Jeffrey C. DelaFuentе, Virginia Commonwealth University. Objective: Compare P4 student self-assessments of professional behaviors and competencies in APPEs with preceptor assessments to determine areas for improvement. Methods: A Web-based evaluation form with a grading rubric common to all outcomes and behaviors was used by students and preceptors to assess 11 professional behaviors and 23 curricular outcome competencies in P4 clerkships for two consecutive years. Assessment data means were calculated and graphed to depict the differences between preceptor assessments and student self-assessments for each professional behavior and curricular outcome. Results: The Class of 2006 rated themselves higher in all behaviors compared to preceptor’s assessments for professionalism; the Class of 2007 rated themselves lower in 10 of 11 behaviors compared to preceptor’s assessment. Two behaviors received the lowest assessment by both preceptors and students: communicates assertively and demonstrates confidence. Comparisons of preceptor assessment showed an overall improvement of professional behaviors in the Class of 2006. The Class of 2006 rated themselves higher in 12 of 23 outcome competencies compared to preceptor rating. The Class of 2007 rated themselves higher in 6 of 23 competencies compared to preceptor rating. Both classes rated themselves higher in 5 identical competencies: critical thinking, informatics and evidence-based pharmacotherapy, disease state knowledge, clinical pharmacology and appropriate medication use. Overall, the performance of the Class of 2007 was rated higher than the Class of 2006. Conclusion: For selected competencies and behaviors there is a disconnect between student and faculty performance assessments. This data will help us develop a strategy to improve the assessment process.

A Competency-based Approach to Teaching Physical Assessment. Mikael D. Jones, University of Kentucky; Mandy Jones, University of Kentucky; Eleanora R. Bird, University of Kentucky; Frank Romanelli, University of Kentucky; Patricia R. Freeman, University of Kentucky. Objectives: PHR 939 Patient Care Laboratory III is the third course in a six semester course sequence designed to teach students pharmacy practice skills within the context of patient care. A competency-based physical assessment (PA) module emphasizing instruction in performance, interpretation, and documentation of basic PA skills needed for provision of medication therapy management was developed for use in this course. Methods: Select organ systems were chosen based upon clinical situations likely to be encountered by a pharmacotherapy generalist. For each laboratory activity, competency-based objectives addressing specific skills related to basic anatomy, PA performance, exam interpretation, and documentation were developed. The objectives, an interactive PA CD-ROM, didactic lectures, and “how-to” guides for select PA procedures were used to complement each laboratory session. Performance of PA skills was evaluated using standardized patients, and remaining competencies were assessed by written formal exams and OSCE-style clinical practice stations. The module objectives will be evaluated through course evaluations and data collected from student assessments. Results: The module was taught for the first time in fall 2006. Data analysis to document student learning is underway. Implications: Teaching PA in the 3rd course of a 6-semester laboratory sequence will provide students foundation skills needed to apply PA in future laboratory courses. The goal of this approach is to provide real life practice simulations that enhance clinical relevance and prepare students to apply learned PA skills during advanced pharmacy practice experiences and ultimately in professional practice.

A Course-Imbedded Strategy for Assessing Written and Oral Communication in First Year (P1) Pharmacy Students. Patricia M. Grace, University at Buffalo; Erin M. Slazak, University at Buffalo; Karl D. Fiebelkorn, University at Buffalo; Peter M. Brody Jr., University at Buffalo. Objectives/Intent: Effective written and oral communication skills are critical for pharmacists. In response to encountering students who were not proficient in communication during the experiential year, four assessment measures were used to identify P1 students who did not demonstrate proficiency in communication. Methods/Process: For the first assessment, a pre-admission interview was conducted with each applicant. Secondly, a “Pharm Speak” exercise required students to read a pharmacy-related script containing medical terms and drug names. This exercise was videotaped and maintained as a baseline for future communication exercises. A “Pharm Write 1” exercise assessed students’ ability to write a well-structured, grammatically correct essay, and for the fourth assessment, “Pharm Write 2”, students summarized and evaluated a journal article. Results/Outcomes: For each assessment, evaluation rubrics were developed to rank the exercise as acceptable (A) or not acceptable (NA). Students with two or more scores of NA (8 of the 121 students) were referred to the English as a Second Language (ESL) Department. Based on input from ESL, a remediation program is developed for each student, and the student’s progress is monitored and assessed throughout the program. Implications: It has been our experience that students with communication deficiencies are able to navigate through the didactic portion of the curriculum, however, find themselves unable to function under the stress of experiential rotations. Students identified early on as having deficient communication skills are provided with a structured remediation plan. Students unable to show improvement will not advance through the program as per current curricular progression policies.

A Practice-Based Learning Experience to Develop Residents as Clinical Faculty Members. Gina M. Zurick, University at Buffalo; Erin M. Slazak, University at Buffalo. Objectives/Intent: An AACP strategic goal is to “recruit, develop, and retain” faculty. Pharmacy practice residents in university-based programs are a key group to focus these efforts, yet very few residency programs provide an opportunity for the development of residents as faculty. Since faculty devote a large percentage of their time to precepting students, the University at Buffalo (UB) has developed a practice-based learning experience for residents designed to develop skills necessary to become an effective preceptor and educator while balancing other professional and practice-related obligations. Methods/Process: A four-week rotation affords the resident an experience as the primary experiential preceptor for Pharm.D. students. This rotation was developed to supplement material taught in the Teaching and Learning Certificate Program, a requirement for UB residents. Following the American Society of Health-System Pharmacy’s (ASHP) Residency Learning System (RLS), the residency preceptor models, coaches, and facilitates the resident’s development as a faculty member and preceptor. The resident is evaluated using the ASHP goals and objectives tailored to this experience. Results/Outcomes: To date, six residents have elected to complete this rotation. These residents will be asked to complete a survey (Likert scale and open-ended questions) to assess the impact of the rotation on their decision to pursue a faculty position and preparedness to serve as a faculty member and/or preceptor. Implications: With the current shortage of faculty, more emphasis must be placed on career opportunities in academia. University-based residency programs are in a unique position to foster the development of residents as future faculty and preceptors.

A Scoring Tool to Standardize Evaluation of Applicants for Admissions and to Evaluate Scores as Predictors of Success. Cherokee Layson-Wolf, University of Maryland; James A. Trovato, University of Maryland; Heather M. W. Petrelli, University of Maryland; Jill Morgan, University of Maryland. Purpose: The purpose of this project is the development and utilization of a new admission application scoring tool to evaluate applicants applying to the University of Maryland, School of Pharmacy. This tool allows the admissions committee to compare candidates based on a group of factors as opposed to single factors such as PCAT or GPA. Methods: The admissions committee identified five target areas that are of major importance when considering a pharmacy school applicant for interview. These five target areas included in the tool are: letters of recommendation, academic performance, PCAT score, work experience, and evidence of leadership. A four point scale was created for each area creating the highest potential score of 20, with 1 as the lowest rating, and 4 as the highest rating. Each candidate is evaluated according to their application packet and the information is utilized in the admissions review process. After the interview process, scores are included based on interview results. Total scores are utilized in the admissions decision process. For those admitted and entering the school, we will compare their tool scores to measures such as GPA to evaluate any relationship between scoring and academic performance. Conclusions: At the end of this admissions cycle, we would have utilized this screening tool for two years and will continue to refine our admissions process for the coming years, we will utilize the data to compare scores of accepted candidates and performance in the first year of the curriculum.

Affective Disorders, Opioid Misuse, and Fibromyalgia in a Primary Care Patients. Rosalind E. Lewis-Smith, Welsh School of Pharmacy, Cardiff University; Kristen M. Rake, The University of North Carolina at Chapel Hill, Paul R. Chelminski, The University of North Carolina at Chapel Hill; Timothy J. Ives, The University of North Carolina at Chapel Hill; Sam Salek, Cardiff University. Objectives: Affective disorders, including opioid misuse, are frequently associated with chronic pain syndromes, but the comparative incidence in fibromyalgia (FM) is unknown. It was hypothesized that the prevalence of affective disorders, including opioid misuse, are more common in patients with FM than those with other forms of non-malignant chronic pain (NCP). Methods: A quantitative, hypothesis-testing cohort trial was conducted in an academic general internal medicine practice. Sixty-two patients referred to a pharmacist-managed chronic pain program within the practice were studied. Thirty-one subjects with a working diagnosis of FM were matched by age and sex, and compared to controls with NCP. Subjects were compared using urine toxicological screens, drug-related criminal convictions, previous diagnoses of affective disorders, and responses to the following inventories: Screener and Opioid Assessment for Patients in Pain questionnaire, the Pain Disability Index, the Personal Health Questionnaire, and the Fibromyalgia Impact Questionnaire. All subjects underwent a physical examination, based upon American College of Rheumatology guidelines. Results: Work will be completed by April 2007 to meet the requirements for the Master of Pharmacy degree (Cardiff). Compared to controls, associations between the working diagnosis of FM and various affective disorders, including opioid misuse, will be analyzed by using SPSS 15.0. Implications: Commonly misdiagnosed, FM is routinely managed with opioids despite no evidence for their efficacy, and the presence of opioid misuse has created a growing public health problem. Identification of the incidence of affective disorders including opioid misuse is important to develop better pain management techniques, and will improve treatment response if adequately addressed.

An APE in an ARNP Staffed Retail Health Clinic Located in a Supermarket. David M. Angaran, University of Florida; Vicki McMahen, The Little Clinic; Becky Christensen, The Little Clinic; Jayne Derocher, The Little Clinic; Kathleen Frezza, The Little Clinic. Background: The Little Clinic® is part of a new concept in medicine known as a retail clinic. These clinics are usually staffed by ARNP’s and PA’s and may be placed in retail pharmacies, supermarkets or retail outlets. The clinic services include the diagnosis and treatment of minor acute illness such as acute otitis media, pharyngitis, and sinusitis, health screening and vaccinations. The University of Florida College of Pharmacy and The Little Clinic are cooperating in the development of an advanced practice experience (APE), located in a supermarket. Objectives: Describe the APE structure and process with a description of the student activities and interactions with both the ARNP and clients. Design: The clerkship is designed as a 4 week, 40-hour weeks experience that will allow students to collaborate with an ARNP, gain an appreciation of the medication related opportunities and insight into how the clinic and ARNP deliver care. The student will have joint preceptors of an ARNP and pharmacist. Assessment: A quantitative list of student activities (categories and frequencies) and qualitative evaluations by the ARNP, pharmacy preceptor and students will be presented. Conclusion: This APE is a new health care delivery model that provides pharmacy students with a unique experience.

An Internet-based Survey of Pharmacy Student Prescription Drug Misuse. George E. Downs, University of the Sciences in Philadelphia; Sarah Lord, Inflexion, Inc., Paul C. Furtaw, University of the Sciences in Philadelphia. Objective: An Internet-based survey of prescription drug misuse by pharmacy students was conducted to better understand prevalence rates of prescription stimulant and opioid usage, given this cohort’s greater access to prescription drugs and increased knowledge and ethical mandates regarding such substances. Methods: Anonymous survey via secure web link of all 1538 pharmacy students (years 1-6) from a private health sciences university located in an urban setting on the East Coast. Survey was promoted in class and via class year-based listserv/ email notification. Survey yielded 950 participants (62% return rate). Bivariate and multivariate analyses were conducted with key demographic variables to examine patterns associated with use. Results: Sample was 64% female, 46% white and 46% East Asian, and equally representative of all six class years. Lifetime prevalence of non-medical prescription opioid use was 7.9% and prescription stimulant misuse was 6.7% (versus general college student population rates of 12% for opioids and 7% for stimulants). A majority (55%) initiated use before college. Students who were white, older, living off campus and getting relatively lower grades were more likely to report stimulant misuse. Prescription opioid misuse was higher among white students relative to others. Opioids (most frequently oxycodone, hydrocodone, and Tylenol with codeine) were used to have fun, get high, and to manage stress. Stimulants (typically Adderall) were used to improve concentration and school performance. Implications: The results indicate a need for improved understanding of at risk sub-groups and for design of tailored interventions specific to pharmacologically savvy students.

Applying Learner-Centered Teaching Techniques to a Pharmacy Communications Course. Laura A. Morgan, Virginia Commonwealth University. Objective: To facilitate student learning by applying learner-centered teaching techniques in the Communications in Pharmacy Practice course. Methods: Course materials were designed to change the balance of power, function of content, and
the purpose and processes of evaluation. A list of required and optional assignments was developed with corresponding point values. The course participation policy was developed by the students on the first day of class. Self- and peer assessments were incorporated into one required and two optional assignments. Course delivery was modified to allow for individual and group activities during class and minimal reliance on lecturing. Results: Sixty-one percent of students (n = 128) completed 4 of the 5 optional assignments. All students selected the learning log assignment. Of the eight students who completed all or part of every optional assignment, one took the optional final exam. Course evaluations indicate students appreciated attempts to accommodate different learning styles but felt there were too many writing assignments and not enough role playing opportunities. Despite these comments, only 29% of students selected the group role play assignment. Underestimation of the number of assignments students would complete resulted in grading delays which affected student attitudes about the course overall. Implications: Learner-centered teaching techniques can inspire students to work hard to achieve the desired grade. The design of the grading system and time required to assess students are important considerations when using learner-centered teaching. Based on student and faculty feedback the course will be revised to include more role playing opportunities and fewer writing assignments.

Assessing Preceptor Understanding of a New Student Evaluation Tool. Raquel Rodriguez, *University of Minnesota*; Rodney A. Carter, *University of Minnesota*; Doneca R. Scott, *University of Minnesota*; Roberta A. Sislo, *University of Minnesota*. Objectives: To explore the level of understanding of the new APPE evaluation tool based on educational outcomes developed by the University of Minnesota College of Pharmacy. Methods: In this evaluation instrument, the performance level of an entry level practitioner (ELP) was the common standard against which student performance was evaluated on a 5 point scale with >4 indicating good performance. Evaluations were collected for the first three rotations of 2006 when performance expectation by students would be lower than at the end of the academic year. One-hundred fifty-three (153) preceptors were identified, based on their rating of students >4 for all outcomes during the first three APPes. These preceptors were sent an online survey. The survey asked to evaluate the grading instrument, clarity of the instructions, and their participation in training related to the evaluation instrument. Results: Thirty-four percent (34%) of preceptors completed the survey. Seventy-five percent (75%) stated that their students did not perform at the level of an ELP even though their evaluations indicated such, suggesting an inappropriate use of this tool. Fifty percent (50%) of the respondents participated in at least one the training opportunities provided by the College. Forty-two percent (42%) of the respondents used the online instructions and 63.5% of those respondents rated the instructions as very clear or clear. Implications: Though multiple educational methods were employed regarding the new evaluation tool and preceptors responded that the instructions were clear, the evaluation results did not show consistent, appropriate use of the instrument.

Assessing Student’s Perceived Creativity and Analytical Skill Improvement for a Self-Care Course Assignment: Project Skunkworks™. Carrie M. Maffeo, *Butler University*; Erin Albert, *Butler University*. Objectives: The objectives of this student project were to assess students’ ability to think both analytically (left brained) as well as creatively (right brained) during a women’s health project assignment in a Self Care course utilizing a small team Skunkworks™ project model and to assess students’ perceptions of their left and right brained ability before and after the assignment. Methods: Student’s completed a pre- and post- electronic survey to assess changes in perceptions of their own skills necessary to work in a Skunkworks™ setting. The skill areas the student were assessed included: leadership, research ability, creativity, idea development, writing, verbal communication, selling ideas, and working in a team. Students in small teams (4-5 students) had to identify an existing women’s health over-the-counter product and propose an innovation. The groups then had to present or sell their innovative women’s health product to their classmates by highlighting the products innovation. Group projects were assessed by submitting a written assignment as well as their group presentation. As an incentive for creativity, the class voted on the best group project and bonus points were awarded. Results: All groups presented their products to the class using various media and visual aids (video commercials, flyers, product demonstrations). Preliminary analysis of the pre- and post- survey suggests that students’ perceptions in all of the skill domains listed above improved numerically on a 5 point Likert scale. Complete survey results and statistical analysis will be presented.

Assessing the Quality of Pharmacy Medicine Rotations Through a Survey of Past Alumni. Nancy T. Williams, *Southwestern Oklahoma State University*; Edna Patatianian, *Southwestern Oklahoma State University*; Elizabeth A. Poorman, *Southwestern Oklahoma State University*; Brian Murray, *Southwestern Oklahoma State University*. Objectives: With growing numbers of students and a frequent shortage of full-time faculty, pharmacy schools often rely on volunteer preceptors/adjunct clinical faculty for training students during their advanced experiential rotations, particularly those dispensing and elective rotations. However, core medicine/ambulatory clinical rotations may also not be routinely conducted by full-time faculty, thus raising concern about the quality of the rotation experience and continuity among the practice sites scattered across the state. The purpose of this project is to (1) determine if our core medicine/ambulatory rotations are adequately preparing students for pharmacy practice, and (2) evaluate if this clinical experience is consistent among the various preceptors. Methods: A survey was mailed in early February to all alumni who have graduated from our pharmacy program within the past three years, which are approximately 250 pharmacists. The survey initially asks general questions about the required core medicine/ambulatory rotational experiences as a whole, followed by specific questions about each medicine rotation and its preceptor. Feedback from recent graduates was chosen over current student evaluations because perspectives differ as practicing pharmacists versus students. Additionally, we want to learn areas of improvement to better meet the educational needs of future pharmacy students. The university institutional review board approved the survey. Results: Research in progress. Implications: The results of this survey will provide insight into recent graduates’ attitudes and perceptions of the core medicine/ambulatory rotations. If negative trends about certain rotations or preceptors are observed, then suggestions for improvement will be offered.

Assessment of Clerkship Grades Assigned by Preceptors Pre- and Post- Grade Inflation Educational Seminar. Laurie L. Briceland, *Albany College of Pharmacy*; Teresa J. Lubowski, *Albany College of Pharmacy*; Robert A. Hamilton, *Albany College of Pharmacy*. Grade inflation is the situation wherein a fixed letter grade comes to represent a lower level of student performance, such that the majority of students receive higher grades (than past students) and/or produce a lower quality of work and lesser achievement of educational outcomes. In an effort to bring grade inflation to preceptors’ attention,
a continuing education seminar which encompassed our own institution-specific data and ways to recognize and address grade inflation was presented to full-time faculty preceptors by three members of Experiential Education. The purpose of this study was to determine if the educational seminar on grade inflation influenced grades assigned by APPE preceptors in attendance. The study protocol was approved by the College of Pharmacy IRB. APPE grades assigned by “study” preceptors for rotations B through I pre- (‘05-’06) and post- (‘06-’07) grade inflation seminar were compared for 15 of 17 faculty preceptors in attendance; 2 preceptors did not have students in either pre-or post-study period and were excluded from analysis. Results: 172 student grades pre-intervention (B-I, ’05-’06) were compared with the 122 student grades currently available from the post- intervention period (B-F, ’06-’07). Respective distribution of grades (‘05-’06, ’06-’07) were: A+: 17%, 17%; A: 35%, 42%; A-: 26%, 9%; B+: 6%, 13%; B: 9%, 10%; <B: 7%, 10%. The distributions are not significantly different (P > 0.05). Implication: An educational intervention to address grade inflation did not appear to impact the assignment of APPE grades by faculty. The study confirmed the skewed nature of APPE grades.

Assessment of Curricular Outcome Goals in Advanced Pharmacy Practice Experiences (APPEs). Beverly A. Talluto, Virginia Commonwealth University; Jeffrey C. Delafluente, Virginia Commonwealth University. Objective: The objective of this study was to determine the frequency in which all terminal curricular outcomes were achieved during the P4 year for all required APPEs. Methods: At VCU, evaluation criteria for APPE are based on established terminal curricular outcome goals. 23 curricular outcome goal statements were incorporated into an assessment form with a grading rubric common to all outcome measures and behaviors. Preceptors are required to evaluate students on all applicable measures and enter their evaluation scores into a web-based system. 2006 evaluation data from preceptors for all 107 students were evaluated. Results: Most outcome measures had a high frequency of being assessed for nearly all required APPEs. For acute care, geriatrics, and ambulatory primary care the following outcomes were met less than 50% of the time: prescription verification, dispensing, drug acquisition, management, and pharmaceutical product knowledge. Advanced community practice and operations-oriented community pharmacy APPEs achieved these outcomes at a higher frequency; however, they were not universally met by all students at all APPE sites. The hospital practice APPE achieved these goals most of the time. Conclusions: We identified a small number of outcome measures that were often not addressed in some required APPEs. Not all required APPE provided students experiences in all terminal outcomes, however, all students were evaluated in all outcomes during some portion of their total APPEs.

Assessment of Service-Learning from the Perspective of Community Partners. Lisa J. Woodard, Washington State University; Brenda S. Bray, Washington State University; Catrina Schwartz, Washington State University; Douglas Weeks, Inland Northwest Health Services. Objectives: Colleges of Pharmacy are called upon to prepare students with the knowledge, skills, attitudes and values necessary to practice as competent pharmacists. Service-learning is an experiential educational model that provides unique learning opportunities for students in achieving these goals. Many programs have assessed their service-learning model from the perspective of student satisfaction, few have reported on the evaluation of the model in meeting the needs of the community partners. In order to fully evaluate the service-learning model and provide for continuous quality improvement, it is vital to identify the needs of community partners and the role and success of service-learning in meeting community needs. This project focuses on assessment of community partner perceptions of the worth of service-learning in supporting the mission of the partner and providing services to their stakeholders. Methods: We developed an assessment tool for assessing the needs of our community partners and our success in meeting those needs. Our community partners were surveyed to gather their perceptions and feedback. Results: The results of the survey will be reported for five major themes: community partner satisfaction with services provided by students, impact of students on the organization, impact of the organization on students, impact of student engagement on the community partners’ clients, benefits and challenges to the community partner of student involvement. Implications: This information will provide valuable feedback for improved student learning and service to our communities. It will be useful to other pharmacy programs as they continue to evaluate and develop their service-learning programs.

Assessment of Student/Patient Communication Skills Through Rubric Evaluation. Katherine L. Bellebaum, The Ohio State University; Katherine A. Kelley, The Ohio State University; Christine C. Murphy, The Ohio State University; Julie E. Legg, The Ohio State University. Objectives: The purpose of this work is to assess pharmacy student communication skills with patients at the program level through implementation of a communication assessment rubric for use by faculty and preceptors. A second objective is to collect satisfaction and usability data from users of the rubric in order to improve its use in student and program assessment. Methods: Eleven identified communication skills for pharmacy students were adapted into a usable rubric (Kimberlin, 2006). Content validity was established through experiential faculty’s review of the rubric. Communication skills of P2 and P3 students with patients were assessed through completion of the rubric by faculty and preceptors and analyzed. Feedback on satisfaction and suggestions for improvement were collected from users and analyzed. Results: Descriptive statistics for program level assessment of P2 and P3 communication skills will be presented. The content validity of the rubric along with user satisfaction and suggestions for improvement will be presented. Implications: Creation of this rubric demonstrates how findings in the literature are adaptable for practical use within pharmacy education. Use of this communication rubric contributes to the development of student communication skills with patients. On an individual level, students gain formative feedback on the areas of communication in which they need to improve. On a program level, faculty gain insight into the areas in which students need instruction for furthering their skill growth. Overall, improvement of communication skills among pharmacy students impacts their professional development.

Assessment of a Seminar Course to Improve Student Communication and Presentation Skills. Kim I. Leadon, The University of North Carolina at Chapel Hill. Objectives: To assess the effectiveness of a required two-semester seminar course during the fourth professional year advanced practice experience program to improve student presentation skills. This one credit course serves as a forum for Area Health Education Center (AHEC) pharmacy faculty to evaluate and provide feedback on students’ presentations to improve their written and verbal communication skills. Each semester students are required to research, develop and deliver a formal presentation using appropriate audiovisual media support and handouts. Methods: Following each semester, an anonymous voluntary online course evaluation survey of 123 fourth year students will be conducted for
Behavior, Attitudes, and Perceptions of Pharmacy Faculty Members About Post-graduate Pharmacy Residencies. Lindsey L. Leiker, The Ohio State University; Bella L. Mehta, The Ohio State University; Jennifer L. Rodis, The Ohio State University; Maria C. Pruchnicki, The Ohio State University. Objective: The American College of Clinical Pharmacy (ACCP) issued a position statement asserting at least one year of postgraduate residency training should be required for practicing direct patient care or entering academia. The goals of this project are to determine if pharmacy faculty members: 1) individually promote residencies to pharmacy students, 2) agree residency training should be a requirement for providing direct patient care, and 3) agree residency training should be required for entering academia. Methods: A current roster was obtained from the American Association of Colleges of Pharmacy (AACP). An online survey was delivered via Zoomerang® to members of AACP. Recipients were asked to disclose demographic information including experience and training, perceived benefits of residency training, thoughts on residency as a prerequisite for direct patient care or academia, and if they individually promote residencies. Responses were collected via Zoomerang®. Secondary analysis will be performed with SPSS. Preliminary results: 2,242 members of AACP received the survey. 604 surveys were completed. 94% of the respondents reported routinely promoting residencies to students. 56% and 63% agree one year of postgraduate training should be required for new graduates to provide direct patient care or be appointed as adjunct clinical faculty or preceptor of pharmacy students, respectively. 49% agreed two years of residency training should be required to be appointed to full-time clinical faculty as an assistant professor. Implications: Results are expected to determine if and how faculty members are promoting residencies and whether they are in agreement with residency training suggestions by ACCP.

Building a Pharmaceutical Care Practice: A New Elective in the Pharmacy Curriculum. Sarah M. Westberg, University of Minnesota; Amanda R. Brummel, Fairview Clinic; Linda M. Strand, University of Minnesota. Objectives: The goals of this course are for students to understand the process of establishing a new patient care practice and to develop a professional practice plan that allows the student to implement a pharmaceutical care practice after graduation. In addition, students will understand the process well enough to teach others. Methods: Students complete several assignments that culminate in a final practice plan proposal (written and verbal) which is appropriate for presentation to administrators, investors or a granting agency in order to secure resources for the initiation of a new pharmaceutical care practice. During the course, students are actively engaged in discussions including topics such as developing a vision, commitment to personal competency, interprofessional communication, collaborative practice agreements, marketing, current reimbursement opportunities, and financial planning for the practice. Guest speakers also discuss building practices, changes in practice laws, and management. The course is open to students in their P1-P3 years. The students are assessed through their written assignments, class presentations, final practice plan, and an oral examination. In addition, the quality of the course will be assessed through student evaluations. Results: The course currently has an enrollment of 19 students, divided between the Minneapolis and Duluth campuses. Analysis of student evaluations and student performance will be available at the end of the spring semester 2007. Implications: This is a unique elective in which students develop a pharmaceutical care practice plan, which they can utilize to develop practices immediately following graduation, or after completion of residency/other post-doctoral training programs.

CLICKERS!: Assessment of an Audience Response System in the Pharmacy Curriculum. Laura A. Morgan, Virginia Commonwealth University; Wesley J. Poynor, Virginia Commonwealth University; Joanne Peart, Virginia Commonwealth University. Objective: To utilize an audience response system (ARS) to enhance teaching and learning in three core courses in the first year pharmacy curriculum. Methods: Faculty attended a 2-hour session on teaching with audience response systems. eInstruction® CPS RF devices were implemented in: Communications in Pharmacy Practice, Principles of Pharmacy, and Biopharmaceutics and Dosage Form Design. Students purchased their own response “clicker” (~$20) and registered them for each course ($10/semester; $40/lifetime); this allowed student attendance to be recorded and responses to be tracked and graded. ARS was used as a formative assessment tool to quiz students on pre-class readings and assess understanding throughout each class period. Feedback on use of ARS was collected from students on course evaluations. Results: In written mid-course evaluations, students requested increased use of ARS during class to allow them to assess their understanding and maintain interest in the material. Final course evaluation in Communications in Pharmacy Practice showed 72.7% of students agreed or strongly agreed that the “clicker quizzes” contributed to their learning and success in the course. The instructors felt that the use of clickers helped them to refine their teaching to emphasize the most important concepts. Additionally, instructors and students alike appreciated the almost instantaneous feedback and increased student engagement. Instructors found the clickers and associated software were easy to use with minimal technical difficulties. Evaluation of use in Biopharmaceutics and Dosage Form Design is in progress. Implications: Student and instructor feedback indicate the use of ARS enhances learning in courses when used regularly.

Comparison of Active vs. Traditional Learning Styles for Teaching Basic Electrocardiogram Interpretation to Pharmacy Students. J. Nile Barnes, University of the Incarnate Word; Lila P. LaGrange, University of the Incarnate Word. Objective: To determine whether an active learning approach vs. traditional techniques increases student ability to interpret electrocardiographic rhythms (ECGs) and correlate with the cardiac cycle. Methods: All participating students were given a pre-test to assess baseline ECG interpretation and cardiac cycle knowledge with a survey to collect their demographic information. All students then attended a traditional classroom lecture and were given homework on ECG interpretation. Students were then randomly assigned to a control group where they attended a traditional review session and discussion of assigned homework, or the active learning group where they attended an
active learning session in which they acted out the depolarization & repolarization and contraction & relaxation of representative heart cells. Following these sessions, all subjects were retested on ECG interpretation and the cardiac cycle. Results: Mean baseline pre-test scores were similar (14.4 & 15.2%, p = 0.99) between groups. Mean post-test scores were also similar (59.8 & 60.4%, p = 0.88). Subgroup analyses are pending.

Implications: Active learning processes are often advocated as a more productive teaching and learning method in which students act out activities as compared to using traditional techniques such as lecture, homework and group discussion. Electrocardiogram (ECG) interpretation is often a difficult skill for students to grasp, as it is a two-dimensional representation of a three-dimensional process. In this case, the use of active learning instead of traditional techniques did not significantly alter the post-test scores.

Comparison of Two Web-Based Assessment Software Tools. Therese I. Poirier, Southern Illinois University – Edwardsville; Radhika Devraj, Southern Illinois University – Edwardsville. Objectives: The purpose of this research is to evaluate and compare two web-based assessment software tools: True Outcomes and eLumen. Methods: The tools are evaluated as to their assessment abilities for: 1) programmatic assessment including curricular effectiveness, providing for perception surveys of student, alumni and faculty, overall learning performance assessment, and curricular mapping; 2) course assessment including documentation of student learning, and use of portfolios; and 3) future potential assessment goals. Other criteria evaluated include ease of learning; ease of use by faculty and students; interfacing ability with student information systems and course management systems; technical support provided by vendor; number of subscribers; and cost. Data sources used to evaluate tools are Internet product description, vendor survey, demonstration of tool by vendor, and pilot of use of tools with selected courses. Outcomes: Based on the results from the evaluation, a tool that can meet our assessment objectives is identified. Implications: This evaluation will identify useful assessment tool(s) that can help meet ACPE accreditation standards for assessment. It will also provide others with evaluative data that can be used in decision making on assessment software tools.

Course Mapping a PharmD Curriculum for the Existence of Medication Safety Principles and Concepts. Susan Jacobson, Massachusetts College of Pharmacy and Health Sciences - Boston. Objective: To conduct a course mapping survey of all required didactic and laboratory courses taught within the first three professional years of a PharmD curriculum in order to assess the existence of medication safety principles and concepts. Methods: A course mapping instrument consisting of eight medication safety categories with associated criteria as delineated by literature review was developed by the principal investigator. Threshold ratings were determined for each category with variations between categories and professional years of the curriculum. Data was gathered by review of the course objectives listed on 22 didactic and laboratory course syllabi for the existence of medication safety principles and concepts. In addition, course coordinators responsible for each of the reviewed course syllabi were interviewed to validate and add information to the course mapping document. A rating scale of one to five was used to score criteria items in each category on the course mapping instrument. The scores were entered on a spreadsheet and tabulated for results. Results: Preliminary course mapping results reveal that courses taught in professional year one (n = 8), professional year two (n = 9), and professional year three (n = 5) fell below the thresholds listed for each of the medication safety categories. A gap analysis will be performed with the completed results. Implications: Medication safety principles and concepts are important in pharmacy education. It is essential to incorporate objectives related to medication safety within the PharmD curricula. Faculty development and training in current medication safety principles and concepts is needed.

Creating a PEPSIG Resource Library of Experiential Program Development Resources (AACP APPi Initiative Part II). Beverly A. Talluto, Virginia Commonwealth University; Ruth E. Nemire, Nova Southeastern University. Objectives: Expansion of the AACP Advanced Pharmacy Practice Initiative (APPi) PEPSIG Resource library to include resources for experiential directors/coordinates to use in program development. Methods: Keywords and a definition of each keyword were developed to describe aspects of experiential programs. Search for resources included the internet, EBSCoHost, Medline, Wilson Text, individual pharmacy and medicine journals, and leadership and educational texts. PEPSIG Members were invited to submit resources, conference calls and Web-Ex sessions were scheduled weekly to review resources, and assign categories and keywords. Continuous editing eliminated synonymous keywords and double postings. Mapping frameworks were developed to ensure that all topics were included in the reference. A survey to evaluate library use and usefulness was developed. Feedback on library keywords, types of resources people considered valuable and thoughts for the future of the database was solicited from participants at the 2006 National Experiential Education Conferences in Lansdowne Va. Results: During 2006 over 300 additional references and resource lists on program development and additional resources for preceptor development and training were added to the PEPSIG Resource Library. Keyword definitions were added for improved user application. Implications: This reference library will continue to be monitored for accuracy and will be maintained and updated regularly. Follow up by Talluto and Nemire includes review of a survey of faculty awareness of the program, and completion of an article describing the development and implementation of the reference library.

Curricular Initiatives for Promoting Pharmaceutical Management for Underserved Populations. Hazel H. Seaba, The University of Iowa; Keith W. Johnson, Management Sciences for Health; Anne K. Wiser, The University of Iowa. Increased focus on improving access to medicines both domestically and globally has created a demand for pharmacists with expertise in pharmaceutical management. Objectives: To help meet this need the University of Iowa College of Pharmacy has partnered with Management Sciences for Health (MSH) to achieve these student centered goals: 1. increasing understanding of health care issues confronting underserved populations; 2. generating awareness of pharmaceutical management in underserved populations as a career option; and 3. teaching skill sets that provide a base for work in pharmaceutical management. Methods: A unique linkage with UI-COP has allowed MSH to allocate USAID funding to support this initiative. With advice of an Advisory Council, strategies have been developed for the three goals. These include highlighting health issues confronting underserved populations, a web site, teaching cases with health disparities, invited speakers, and a mentor program. Additionally the curriculum has been enhanced by nurturing programs fostering service to underserved (PharmD-MPH, Global Health Studies Certificate) and by introducing new electives (International Perspectives: Xicotepec, Mexico; Medication Management for Underserved Populations) and APPEs (Medication Management for Xicotepec; MSH Center for Pharmaceutical Management). Results: This spectrum of activities is in place for 06-07. The new
Developing a National Preceptor Training Program. Abir (Abby) A. Kahaleh, Lake Erie College of Osteopathic Medicine; Beverly A. Talluto, Virginia Commonwealth University; Janet Astle, Duquesne University; Mara A. Kieser, University of Wisconsin; Peter J. Tyczkowski, The University of Connecticut; Debra A. Copeland, Northeastern University; Carla J. See, West Virginia University; Kathleen H. Besinque, University of Southern California. Objectives: To evaluate, select, and identify key elements for a national preceptor training program using the Professional Experience Programs Special Interest Group (PEPSig) Resource Library Process: The PEPSig Resource Library contained 104 resources on preceptor development programs. A PEPSig Preceptor Development Committee was formed and each member reviewed and evaluated 10-12 resources. The survey identified important components of preceptor training. From this data key concepts to be included in a National Preceptor Training Program were selected. Additional resources in the library were then identified for review using the key concepts. Preceptor training topics were also added from experiential directors who attended the 2007 May and November AACPs Institutes. The Committee further refined the review process and ranked the resources on a five-point Likert scale from 1=not important and 5=very important. The committee will conduct a final review to prioritize items that will be included in the National Preceptor Training Program. Approximately, a total of 500 items related to the identified key concepts on preceptor training program were reviewed. Outcomes: The following eight key concepts for preceptor training were identified: setting expectations, evaluation/assessment/feedback, teaching effectiveness, handling difficult situations, communication and professional interactions, motivation, cultural diversity, and student orientation/professionalism. Twenty additional topics were suggested by Institute attendees. Implications: The ultimate goal of developing a national preceptor program, to combine resources among the colleges of pharmacy and improve preceptors' practice and teaching skills.

Development and Evaluation of an Introductory Enrichment Experience in Teaching for Pharmacy Residents at an Academic Medical Center. Maria C. Pruchnicki, The Ohio State University; Crystal Tubbs, The Ohio State University; Marialese S. Bennett, The Ohio State University. Objective: Teaching is an important component of contemporary pharmacy practice, even though pharmacy residents may not pursue full-time academic positions. Our purpose was to assess the impact of an introductory (eg. PGY-1) enrichment experience on teaching development and perceptions of ability/confidence for residents at an academic medical center. Methods: Residents participate in an elective, eleven-month program designed to introduce hospital-based residents to pedagogical principles and teaching strategies. Activities include attendance at a teaching workshop, participation in longitudinal discussions, observation/participation in clinical teaching activities, and a mentored classroom experience. Personal reflection, written formative assessments, and informal discussions are used to further participants' understanding of educational principles. Participants complete 80 hours of activities; each will receive a certificate from the affiliated college of pharmacy and qualify for an elective rotation for their residency. Residents are expected to compile a written portfolio to document progress through the program. Results: Eight trainees have joined the program since August 2006. Program modifications follow standard iterative procedures for ongoing improvements (eg. related to content/activities, clarity of expectations, assessments). Perceptions of overall structure, perceived impact on teaching development, and future interest in teaching will be formally evaluated in a end-of-year focus session. Successful completions will be tracked and may identify candidates for advanced teaching programs. Implications: Residents without formalized academic responsibilities may benefit from elective teaching experiences coordinated with required practice commitments. Structured enrichment programs should include varied activities including clinical education and precepting opportunities. This is expected to enhance their effectiveness as pharmacy practitioners and educators.

Development and Implementation of a Flowchart for Ointment Base Selection. Jeannine M. Conway, University of Minnesota; Michael C. Brown, University of Minnesota. Objectives: To improve students' skills in selecting appropriate ointment bases through the development of an ointment base selection flowchart. Methods: A flowchart was designed to help students make decisions about ointment base selection, considering desired product properties, particle size reduction requirements, liquid/semi-solid compatibilities, and patient acceptance. Students worked with the flowchart throughout the semester in both dry lab and wet lab activities. At the end of the semester, students completed a dry lab practical that included the requirement of selecting an appropriate ointment base and levigating agent. Student performance data from the previous year's dry laboratory practical was compared to the current year's performance data. Labeling and calculations performance between the two years was also compared as a control, as these were not part of the flowchart. Results: Prior to implementation of the flowchart, 52 of 103 students selected the correct base. After implementation, 85 of 106 students selected the correct base (p < 0.001). Neither labeling errors nor calculation errors were statistically different between the two years. Implications: The ointment base selection flowchart improved student performance when used in the context of a dry lab assignment. This difference does not appear to be simply due to a difference in class performance. Future application will include an evaluation of its impact on base selection during a wet lab practical.

Development and Implementation of a Required Course on Diversity for Doctorate of Pharmacy Candidates. Nicholas R. Blanchard, St. John Fisher College; Christine R. Birnie, St. John Fisher College; Amy L. Parkhill, St. John Fisher College; Richard O’Brocta, St. John Fisher College; Michael DeBisschop, St. John Fisher College. Objectives: To develop and implement a required course on diversity that addresses the diverse patient population pharmacists serve. Methods: The course was developed as a one credit required course for first professional year doctoral candidates. Differences in gender, race, sexual orientation, culture and religion were among the topics discussed. The class format included guest lecturers, film presentations, small group discussions, and student writing assignments. Students were also required to participate in a service learning component consisting of at least 10 hours of community service in a diverse patient population setting. The class was assessed with a pass/fail grading system and student evaluations were performed at the completion of the course. Results: The course was successfully administered to 55 students in the first semester of a four-year professional curriculum. Two movies were shown, and six speakers from diverse backgrounds addressed the students. Of the 55 students...
enrolled, 54 received a pass score, and one student withdrew from the course. Students self evaluated that they gained an understanding and awareness of diversity, as evidenced by an average score of 5.5 out of 7. By the completion of the course, 22% of the students have surpassed the required 10 hours of community service and are continuing to volunteer at community sites. Implications: This course, or adaptations of it, can be adapted into any doctoral program today, providing students the knowledge and experience to be better able to address their patients’ diverse needs.

Development and Assessment of an Evidence-based Elective Course on Dietary Supplements. Mario M. Zeolla, Albany College of Pharmacy; Machaon M. Bonafede, Albany College of Pharmacy. Objectives: To develop and assess a new 3-credit elective course designed to provide student pharmacists with the knowledge and skills necessary to confidently provide evidence-based pharmaceutical care to patients using dietary supplements. A secondary goal is to develop a reproducible and interactive learning experience. Methods: Pharmacy education literature was reviewed to identify descriptions of complementary and alternative medicine courses. Elements of these courses were incorporated into teaching activities. Pre- and post assessment of student opinions and knowledge/skills related to course objectives will be obtained using a fifteen-item instrument containing Likert scale and multiple choice questions. Student learning will be assessed through quizzes, cases, and a longitudinal group project. A standard course evaluation instrument will also be administered at the mid-point and end of the course. Results: The course employs a cooperative learning approach focusing on reviewing and applying scientific evidence to patient care. Introductory topics included evidence-based medicine, regulatory issues and information resources. Supplements were categorized by indication and reviewed. Case-based group activities were completed and discussed in class. Pre-course assessments indicate that most students were not confident in their ability to provide care to patients using supplements. Although baseline knowledge scores were relatively high (mean: 73%), students performed poorly on two higher-order questions requiring application of knowledge to patient cases (mean: 34%). Implications: By merging components of other well-designed courses and assessing our course using various measures, we strive to optimize learning and achieve our goal of improving student’s ability to provide evidence-based care to patients using dietary supplements.

Development of an E-Health Course for PharmD Students. Marie A. Smith, The University of Connecticut. Objective: To develop a new elective course on E-Health and emerging technologies that impact patient care and pharmacy practice. Methods: The 2007 ACPE Standard 12 (Professional Competencies and Outcome Expectations) states that pharmacy graduates must be able to demonstrate expertise in health informatics. In Fall 2006 and Spring 2007, an E-Health course was introduced as a 2-credit elective for P1-P3 students. Topics included online drug and health information for consumers/health professionals, electronic health records, e-prescribing, remote disease monitoring, e-health payor trends, and related regulatory events. A holistic view of the topics was examined from the consumer/patient, provider, payor, and health-system perspectives. Instructional formats included small group discussions, correlated online assignments, assigned readings, national technology leaders as guest lecturers, and field trips. A final project (determined in conjunction with CT Pharmacists Association) addressed a current, pharmacy-related health-informatics need. Students were assessed on class participation, assignments, quizzes, presentations, and the final project. Outcomes: Assessments included a course evaluation and a pre- and post-course survey of students’ e-health knowledge. The course integrated content from health systems, patient safety, health literacy, drug information, and writing/presentation skills. As a result of taking the course, one student pursued an independent study to evaluate CT pharmacists’ beliefs and attitudes on e-prescribing. Implications: Enriched PharmD student knowledge of emerging technologies that impact pharmacy practice and patient care; developed course content in health informatics consistent with a 2007 ACPE standard requirement; encouragement to other pharmacy schools to consider adding E-Health course content.

Documentation of Drug Related Problems, Interventions, Disease State Encounters and Patient Populations in P4 Rotations. Beverly A. Talluto, Virginia Commonwealth University; Laura A. Morgan, Virginia Commonwealth University; Nancy S. Yunker, Virginia Commonwealth University; Melissa I. Williams, McGuire VA Medical Center; Cynthia K. Kirkwood, Virginia Commonwealth University; Kimberly A. Cappuzzo, Virginia Commonwealth University; Brigitte L. Sicat, Virginia Commonwealth University; Amy L. Whittaker, Virginia Commonwealth University; Rebecca J. Collins, Bon Secours Memorial Regional Medical Center. Objectives: To collect information on rotation activities and provide opportunities for students to improve documentation in drug related problems, interventions, populations and disease state encounters during P4 experiential rotations. Methods: The Experiential Education Clinical Advisory Board reviewed existing documentation forms to develop a web-adaptable form. Students used the form to record the following information for each intervention: patient age, gender, drug and/or disease state involved, drug related problem (DRP), classification, intervention, result, actual time involved, expected outcome intervention specifics, rotation number And type. As a pilot, students on rotation with faculty on the advisory board completed approximately 25 DRP forms per rotation. Based on initial feedback the form was enhanced to be more concise and applicable for all sites. Data collected from the students were entered into an Access® database for collation and analysis. Results: Preliminary data indicate that patient populations seen on rotation correlate to rotation type. Most patients were women and over 60 years of age. Drug needed but not prescribed and inappropriate dosage represented the most frequent DRPs. Common interventions were drug additions, discontinuations and dose change; fewer patient training, life-style changes and health screenings were documented. Students tend to mark improved efficacy as the most expected outcome. Actual student time involved to make the intervention was recorded as 15 minutes or less. Implications: Documentation of patient populations, disease states and drug related problems encountered during P4 experiential rotations will be used for program improvement.

Effect of an Individualized Learning Program Designed to Enhance Student Performance in a Psychiatric Pharmacotherapy Course. Christian R. Dolder, Wingate University; Donald D. Nuzum, Wingate University. Methods: A prospective, controlled study involving pharmacy students enrolled in Psychiatric Pharmacotherapy was conducted to measure the effects of an individualized learning program designed to improve student mastery of psychotropic pharmacotherapy. On the first day of class, participants completed a pre-test designed to examine their knowledge of the three major psychotropic classes (i.e., antidepressants, antipsychotics, mood stabilizers). Each student’s lowest score of the three psychotropic classes became their area of instructional need and target of the intervention. The other two medication classes served as the control
areas of instruction. Course design and delivery was the same for all students with the exception of the intervention’s two components. The first was a paper assigned to each participant targeting the identified psychotropic class. Each participant was also given access to a moderated Powerpoint-based instructional supplement related to their area of instructional need. At the end of the course, students completed a post-test identical to the pre-test. Change scores derived from the pre- and post-tests were used to compare the effects of the intervention versus the controls. Results: Sixty-one pharmacy students were enrolled into the course and study. Participants were evenly distributed among the antipsychotic, antidepressant, and mood stabilizer intervention arms. The effect of the individualized learning program on student performance compared to teaching as usual will be analyzed. In addition, student acceptability of the intervention and its feasibility will be discussed. Implications: If successful, the individualized learning program has the potential to provide targeted coursework that enhances student learning.

Enhancing Professional Development Through Organized, Self-directed Student Programming. Anne Marie Liles, Auburn University; Jessica A. Starr, Auburn University; Kristi W. Kelley, Auburn University. Objectives: The profession of pharmacy is rapidly evolving. As students work towards completing their education requirements there is little formal guidance on career planning, professional development, and academic achievement. Therefore, we sought to provide a program for pharmacy students that would allow them to participate in a series of discussions that would not only be informative, but promote professional development while enabling them to network with fellow classmates and faculty. Methods: This was a pilot study using fourth-year pharmacy students. Students were provided with the opportunity to attend programming on the following: finding the right employer, career success, residencies, curriculum vitae and cover letter writing, interviewing skills, financial planning, and NAPLEX and MPJE review. A baseline assessment pertaining to the students understanding of each of these areas was obtained. Both a midpoint and final assessment will be performed. Results: This program was piloted with 25 fourth-year pharmacy students. The baseline assessment showed that only 10% of students felt they were prepared to search for a job while 19% felt they were prepared to search for a residency. Only 14% of students felt they were prepared to create a curriculum vitae. When asked about career plans after graduation, 15% wanted to work in retail, 45% wanted to pursue a residency and 40% were unsure of their plans. Midpoint and final assessments are pending. Implications: Baseline data indicates that students would benefit from a program that allows for continued development of professional behaviors and attitudes as they prepare to enter the workforce.

Establishment of a Pharmacy Elective - Medication Errors. Jennifer L. Petrie, University of Wyoming. Objectives: Approximately 1.5 million preventable adverse drug events (ADEs) occur each year in the United States (IOM, 2006). For each preventable ADE in a hospital setting, an estimated $8,750 is added to the cost of a hospital stay (IOM, 2006). Medication Errors is a newly developed course at the University of Wyoming School of Pharmacy designed to educate multidisciplinary students as to why the error(s) occurred, and instruct them in prevention techniques. In addition, the students become familiar with available medication error reporting systems. Methods: The course is a one credit hour elective that includes a combination of lecture and student discussion. The student discussion revolves around pertinent medication error cases relating to the weekly lecture topic. Following small group discussions, all case-specific results and recommendations are shared. Students complete small-group presentations discussing a medication error encountered at one of the student’s work sites. These presentations include how the medication error occurred, and the means taken to prevent the medication error from reoccurring. Results: There are nine pharmacy students (four second-year students, five third-year students) and one pre-nursing student enrolled. This interprofessional enrollment has facilitated education of fellow healthcare providers’ roles in patient care. Further results will be available upon completion of the course in May 2007. Implications: Establishing an interprofessional medication errors elective promotes an understanding that various healthcare providers working collaboratively will enhance patient care and medication safety, and potentially reduce extraneous costs associated with preventable medication errors.

Evaluating the Effectiveness of an Audience Response System in Two Distinctive Professional Pharmacy School Courses: Pharmacokinetics and Applied Drug Information. Nancy Nkansah, University of California at San Francisco; Candy Tsourounis, University of California at San Francisco; Deanna L. Kroetz, University of California at San Francisco; Michael E. Winter, University of California at San Francisco; Betty-ann Hoener, University of California at San Francisco. Implications/Background: The effectiveness of audience response systems has been under-studied in health professional education literature, especially in pharmacy. Studying the utility and feasibility of this technology in various academic courses (Pharmacokinetics-mathematically intensive/Drug information-skill-oriented) will allow instructors to decide whether the ‘real-time feedback’ such systems provide add benefit to their courses. Multiple interactive methodologies have been successfully utilized by course coordinators to facilitate learning, but may still be sub-optimal. Objective: The objective of this study is to evaluate the effectiveness, practicality, and student/faculty satisfaction of an Audience Response System in promoting student learning in both a pharmacokinetics and drug information course. Course grades and student/faculty questionnaires will be utilized to collect outcome data. Methods: The primary objective will be assessed by conducting a cohort study comparing the grades of a cohort of students taking the courses in Fall 2006/Winter 2007 with a historical control of students who took the course in Fall 2005/Winter 2006. The primary outcome will be student performance as measured by test, participation, and overall course grade. The secondary objective will be assessed by administering a questionnaire post-Fall 2006 quarter and post-Winter 2007 quarter to students and course coordinators. This survey tool is designed to elicit responses on the following secondary outcomes: student and faculty evaluations of interaction, attentiveness, understanding, technology utilization, course efficiency, and satisfaction. Results: This study is still in progress, as students are still enrolled in these courses. Data will be analyzed at the conclusion of the Winter 2007 academic quarter.

Evaluation of Activities and Learning Tools in Introductory Pharmacy Practice Experiences. Geralynn B. Smith, Wayne State University. Objective: The Wayne State University IPPE is a 2-semester sequence in the second professional year. The primary goals are to enhance the students’ professional growth and communication skills. Students visit underserved clinics, shadow fourth year students on APPEs, participate in professional activities, meet with faculty advisors, and develop a professional resume. An electronic portfolio system is used to monitor student achievement through reflective learning assignments. Method: To evaluate the value of the activities, the effect of self-reflection, and the role of the e-portfolio on
professional development and student learning, each stakeholder was surveyed with separate instruments. Second and fourth students and faculty advisors were surveyed using the SNAP Survey Software. Each clinic director was visited and personally interviewed. The course instructor responded to a written survey. Results: Second year students responded positively to academic activities contributing to growth in communication abilities and professional development. Reflective responding in an e-portfolio was not perceived as a valuable tool. The instructor monitored student development by reviewing the students’ e-portfolio reflective entries. Fourth year students agreed positively as to the value of having students shadow them. Faculty advisors indicated the importance of meeting with their advisees and reviewing their e-portfolios. Clinic directors supported the students’ contributions to their patients and supported the students’ professional growth. Implications: The course has been reformatted towards more professional and communication skill development. A student self-assessment of course expectations has been added. All stakeholders will be resurveyed this spring. Comparative results will be available in July.

Evaluation of Instructor Usage and Satisfaction Toward Technology-Based Instructional Resources in Diabetes Education (DM Educate). Deanne L. Hall, University of Pittsburgh; Susan M. Meyer, University of Pittsburgh; Scott R. Drab, University of Pittsburgh; Randall B. Smith, University of Pittsburgh. Objectives: To evaluate instructor use patterns of materials and course components provided through DM Educate, a comprehensive, web-based diabetes elective course, and instructor satisfaction towards this technology-based instructional resource and diabetes care. Methods: Upon registration for DM Educate, course instructors complete a Pre-Course Survey which includes questions about how the instructor intends to use the course and the components, what type of students will be participating and an anticipated enrollment number. After course completion the instructors are asked to complete a Post-Course Survey which will ask similar information to allow for a comparison of what was intended and what occurred. In addition, the Post-Course Survey includes questions to assess instructor satisfaction of the course content, design, technology utilized and application to the practice setting. All surveys are completed on-line via a commercial survey tool. Results: Forty-eight instructors at colleges and schools of pharmacy utilizing DM Educate have completed the Instructor Pre-Course Survey. Eleven instructors have completed the Post-Course survey to date. Survey data will be analyzed after each registered college and school of pharmacy has completed the course for the spring semester. Implications: Obtaining feedback from instructors utilizing DM Educate will provide evidence for continued (or discontinued) use of this instructional resource, as well as provide a rationale for expanded use of technology-based instructional resources in general. In addition the comparison of Pre-Course and Post-Course differences, and instructor satisfaction survey responses will assist in identifying areas for improvement within DM Educate.

Evaluation of Patient Impact of an Early Experience in Cardiovascular Risk Factor Assessment. Laurel L. Andrews, The University of Pittsburgh; Connie L. Smith, The University of Louisville at Monroe; W. Greg Leader, The University of Louisville at Monroe College of Pharmacy. Objectives: The purpose of this project is to (1) assess patient satisfaction with a cardiovascular risk assessment program provided as a part of second-year pharmacy students’ service learning project, and (2) assess patient compliance with recommendations made for medical follow-up generated from the assessment. Methods: Cholesterol testing, blood pressure screening and cardiovascular risk assessments were performed by second-year pharmacy students in four community pharmacies and recommendations for follow-up were made based on the results of these evaluations. A 10 question patient satisfaction survey based on a 5-point scale was administered to the participating patients as the last step in their testing process. Based upon the results of the screenings, recommendations were made to some of the patients for follow-up with a health care provider. A follow-up phone call was made at least 4 weeks after the patients’ screenings to see if these recommendations were followed. Relationships between patient satisfaction with the service and compliance will be evaluated. Results: 43 of 59 patients who underwent evaluation completed patient satisfaction surveys with 14 patients referred for further evaluation. Evaluations of the results are pending. Implications: Results of patient satisfaction surveys will be used to improve service quality. Although the sample size is small, follow-up with patient compliance will provide data on patient acceptance of pharmacists’ recommendations in community pharmacies in our area and any relationship that exists between patient compliance and patient satisfaction with the service.

Evaluation of Student Knowledge and Satisfaction Toward Technology-Based Instructional Resources in Diabetes Education (DM Educate). Deanne L. Hall, University of Pittsburgh; Susan M. Meyer, University of Pittsburgh; Scott R. Drab, University of Pittsburgh; Randall B. Smith, University of Pittsburgh. Objective: To evaluate student knowledge of diabetes management after utilization of DM Educate, a web-based, comprehensive diabetes course, and student satisfaction of the course content and web-based design. Methods: Students at colleges of schools of pharmacy utilizing DM Educate as a stand-alone elective course will be asked to participate in the course evaluation. Evaluation of student learning will be assessed though the Pre- and Post-Course Knowledge Test which comprises of 34 questions, 2 to 3 randomly selected from each of the 12 DM Educate modules. This test is for evaluation purposes only and will not affect student course grades. Student satisfaction will be assessed though a Post-Course Student Satisfaction questionnaire focusing on course content, design, technical aspects and influence of this course on future courses or experiential learning opportunities chosen by the student. All tests and surveys are administered on-line via a password protected commercial survey tool. Results: One hundred and eighteen students have completed the Pre-Course Knowledge test to date. The Post-Course Knowledge Test will be compared to the Pre-Course results, and the Student Satisfaction Survey results will be analyzed upon course completion in May. Implications: The results of the student knowledge tests will determine whether learning is facilitated with this technology-based instructional resource and provide support for continued (or discontinued) use of the web-based course. Identification of deficits in student learning and assessment of student satisfaction will aid in making necessary enhancements to the DM Educate content and web-site.

Evaluation of Student Career Plans of Pharmacy Students. Lauren S. Schlesselman, The University of Connecticut; Craig I. Coleman, The University of Connecticut; C. Michael White, The University of Connecticut. Objective: The objective of this project was to evaluate the current career plans of pharmacy students at different stages in the professional program. Methods: After approval by the Institutional Review Board, first, second, third, and fourth professional year pharmacy students were offered the opportunity to provide information pertaining to their current career plans. Students were asked to rate the likelihood of ever pursuing a position
in various pharmacy settings, in various areas of pharmacy practice, at various levels of within the management hierarchy, or in pursuing another degree. **Results/Implications:** Pending final analysis.

**Evaluation of the Effectiveness of Nonprescription Drug Case Studies in a Large Classroom Setting,** Diane Nykamp, Mercer University; Leisa L. Marshall, Mercer University; Laurel E. Ashworth, Mercer University. **Objective:** To evaluate the feasibility of an electronic pharmacy model for integrating case studies using nonprescription drugs into a pharmacotherapy disease state module.

**Methods:** An electronic pharmacy model for case studies was designed and implemented. Third year students (n = 140) enrolled in a required pharmacotherapy module. Integument and Special Senses were divided into groups of 4 and were randomly selected to answer drug related questions to cases studies presented throughout the module. Students were responsible for selecting the most appropriate over-the-counter (OTC) drug therapy with dose, mechanism, and patient information. Students used the electronic pharmacy to document products that would be recommended to a patient in a practice setting. The electronic pharmacy consisted of a 3 to 4 page Power Point presentation containing multiple pictures or images of specific OTC products selected from each case. They were submitted via WebCT to faculty instructors at the end of the module for a grade.

**Results:** Assessment will include student grades for the project and student evaluation (on a 5pt. scale) of the course and open ended comments. **Implications:** Integration of an electronic pharmacy to document learning activities in case studies along with traditional teaching methods in a large classroom setting may be an effective way of providing active learning.

**Evaluation of the Student Learning in and Attitudes Toward an Early Experience in Cardiovascular Risk Factor Assessment,** Laurel L. Andrews, The University of Louisiana at Monroe; Connie L. Smith, The University of Louisiana at Monroe; W. Greg Leader, The University of Louisiana at Monroe. **Objectives:** The purpose of this project is to determine the educational impact of an early experiential service learning project that consisted of performing cardiovascular risk assessments in four community pharmacies. Service learning projects have recently been implemented longitudinally throughout our pharmacy curriculum. This project was designed to evaluate student learning and identify potential areas to enhance the students’ experience. **Methods:** A 15 question pre- and post-survey, based on a 5-point Likert scale, was administered to second year pharmacy students enrolled in the first class of the Disease Processes and Therapeutics sequence to assess their skills and attitudes related to performing cholesterol testing, blood pressure screening and cardiovascular risk assessments. The pre-survey was given prior to student training on the use of the Cholestech LDX® and digital blood pressure monitors, and the post-survey was given to students after completion of the experience. **Results:** A total of 72 students completed both the pre- and post-survey. Evaluations of the results are pending. **Implications:** In addition to providing an early learning experience for students, this project provided a model of preventive health screening for local pharmacies as well as a health care service to our community. Surveys were designed to test the impact of the training programs and the service learning project on student learning and attitudes towards providing these services in the community. The results of the surveys will be used to improve the educational aspect of this experience.

**Expansion of Experiential Learning Opportunities through Medication Reconciliation Participation,** Jane M. Gervasio, Butler University; Julie M. Koehler, Butler University; Kevin M. Tuohy, Butler University; Julie L. Williams, Methodist Hospital at Clarian Health Partners; Mary H. Andritz, Butler University. **Background:** The JCAHO-mandated medication reconciliation (MR) process is an integral part of the medication continuity between pre-admission, admission and discharge from the hospital. The responsibility for reconciling medications may be accomplished by pharmacists, nurses and physicians. Incorporating pharmacy students into this interdisciplinary healthcare team may support both student learning and the mission of the healthcare organization. The purpose of this study is to evaluate the contribution of pharmacy students in the MR process.

**Methods:** Four students were each assigned to a 4-week MR rotation. Students were assigned to a specific unit weekly; each unit had a decentralized pharmacist to oversee the students’ activities. Students were responsible for conducting patient interviews and follow-up with doctors’ offices, pharmacies and outside care facilities to ensure complete and accurate medication histories. Students reconciled the medication histories with the medications the patients were receiving in the hospital. When discrepancies were noted, the students contacted physicians either orally or via written note in the progress section of patients’ charts. **Results:** Over an 8-week period, two rotation cycles, 4,478 patients were admitted to the hospital requiring MR. During that time period, 3,427 (77%) of MR’s were completed. Eight students completed 978 MR’s, which accounted for 29% of the total number of completed MR’s. Further data collection is ongoing as qualitative student interventions are being documented. **Conclusion:** An MR-based experiential rotation allows for development of necessary skills to function as an integral member of a hospital-based healthcare team and supports the achievement of a JCAHO-mandate by the institution.

**Factors Influencing Pharmacy Faculty to Enter Academia,** Christie A. Coggins, University of South Carolina; Laura Moore Fox, South Carolina College of Pharmacy - USC Campus; L. Clifton Fuhrman, South Carolina College of Pharmacy - USC Campus. **Objectives:** It is widely recognized that there is a shortage of pharmacists and pharmacy educators entering academia. Herein, an exploration into the driving forces of this shortage has been undertaken, with the goal of identifying those factors driving academicians into their field of practice. **Methods:** A series of surveys were distributed via email for members of the American Association of Colleges of Pharmacy (AACP). The primary survey, focusing on the availability of and participation in academic rotations was sent to Directors of Experiential Education and Training within each of the AACP accredited colleges of pharmacy. The remaining surveys focused on the number of faculty vacancies and recent hires within each college of pharmacy and the factors driving new clinicians to enter academia. These were sent via listserv to the Dean of each college and to faculty members who had entered academia within the past five years, respectively. **Results:** Although many colleges of pharmacy offer academic rotations for fourth year students, proportionally few students participate in these opportunities. Deans acknowledge a continued gap in faculty appointments, with a wide variety of deterrents to academia being cited. **Implications:** Pharmacy educators will quickly become overwhelmed with the number of students as schools expand to meet the need to graduate pharmacists unless more graduates enter academia. The need to uphold the quality of education provided to students demands that educators be viewed as an integral part of the pharmacist shortage.

**Faculty Training Program Development Within an Inter-institutional Video-teleconferenced Doctor of Pharmacy Program,** Jennifer L. Robertson, Elizabeth City State University and The University of North Carolina at Chapel Hill; Huyla G. Coker.
Objective: To develop a mechanism for training pharmacy faculty who provide student instruction to both campuses using synchronous video-teleconferencing (VTC). Methods: A collaborative workgroup of faculty and instructional technology staff from Elizabeth City State University and the University of North Carolina at Chapel Hill met weekly during the course of three months to develop, review, and revise program policies and procedures and to discuss all observations of VTC instruction from the first year of the program. These discussions identified the need for formal faculty training and formed the backbone for content of the training curriculum. The workgroup developed video-teleconferenced interactive web-enhanced faculty training sessions offered prior to the beginning of each semester. All content was available to faculty on Blackboard™ prior to and following the training sessions. Results: Two types of training sessions were created and offered as a pair or individually. One session focuses on program policies and procedures and VTC sensitivity training while the other focuses on hands-on equipment training and acclimation to the VTC classroom. Six faculty training sessions have been conducted to date, training nineteen faculty members. Trainees, students and faculty facilitators have provided subjective information supporting training program effectiveness. Implications: A systematic faculty training program is essential for the success of a synchronous video-teleconferenced pharmacy program. An electronic repository of program policy and training documents improves accessibility for all faculty, and facilitates communication.

Gauging Curricular Intent Against Program Reality in an Eight Quarter Service-Learning Experience. Julie J. Wilkinson, South University; Eric H. Hobson, South University; Teresa A. Schweiger, South University. The South University School of Pharmacy embedded eight quarters of service-learning in its Doctor of Pharmacy’s early/intermediate professional practice experience program to introduce students to service and altruism as part of a pharmacy professional’s defining ethos, and to provide students leadership opportunities as mentors. Purpose: This assessment project’s focus is twofold: 1) assess the eight-quarter service-learning experience contributions to the development of student ability outcomes mapped to the Early and Intermediate Professional Practice Experiences as conceived in the school’s initial curricular plan, and 2) establish a baseline against which to assess forthcoming changes in the service-learning experience. Methods: The Class of 2008 was surveyed during Quarter Seven using a two-part, thirty-one item survey that elicited student perception of service-learning and introductory practice experience contributions to their development of PharmD curricular outcomes mapped to those experiences. Results: The work in progress indicates, not unexpectedly, that students perceive the intermediate professional practice experiences in quarter five (2, 4-week rotations) as more directly linked to their professional development than the service learning activity. Full results from the closed and open-ended response survey sections will be reported, as well as the model for on-going assessment of this curricular requirement. Implications: Recommendations for internal and external audiences will be presented to help programs with multi-term service-learning activity embedded in their experiential curricula consider programmatic adjustments that help students see service as valuable in their professional education, and to identify specific developmental gains they make via curricular-linked service.

Impact of Clinical Elective Coursework on Student Pharmacists’ Attitudes Towards Patient Care Services. Nicole M. Stack, Albany College of Pharmacy; Nimish Patel, Sara E. Dugan, Albany College of Pharmacy. Intent: The purpose of this study is to determine if clinical elective courses, specifically the Pharmacist-Assisted Tobacco Cessation (PATC) elective, is able to positively affect a student pharmacist’s attitude and comfort level in providing patient care services compared to the required pharmacotherapy modules in the course sequence completed by all students. Students taking this elective are compared to a random sample of students taking the tobacco cessation required module in the Pharmacotherapy course sequence. A difference could demonstrate the benefit of exposing students to clinical elective courses. Process: An anonymous and voluntary survey was developed after reviewing similar surveys published in the medical literature assessing patient care services. Students in the last two years of the pharmacy curriculum were asked to complete the survey. The survey was administered twice over two consecutive years to collect information to capture students’ attitudes before and after the course offering of the tobacco cessation elective. Outcomes: Information collected includes demographic information and pharmacy work experience. Our endpoints will assess confidence in the knowledge of various disease states, comfort in providing patient care services, and confidence to use a therapeutic thought process. Analysis will be completed on these variables using the Pearson chi-square, Fisher’s exact test, and Multivariable analyses, while adjusting for confounders. Implications: One potential application would be to incorporate additional clinical electives into the pharmacy curriculum as required coursework. Additional research is warranted in a larger group of students taking clinical electives and adjusting for other variables before curricular changes can be determined.

Impact of an Introductory Leadership Course on Student Leadership Beliefs and Behaviors. W. Greg Leader, The University of Louisiana at Monroe; Laurel L. Andrews, The University of Louisiana at Monroe; Mary C. Caldwell, The University of Louisiana at Monroe; Lesa W. Lawrence, The University of Louisiana at Monroe. Objectives: The purpose of this project is to evaluate the impact of an introductory leadership course on leadership behaviors and beliefs of pharmacy students. Methods: Pharmacy students actively participating in leadership roles in professional organizations within the college were invited to enroll in an introductory leadership course. A 17-question leadership belief survey (LBS), based on a five point Likert scale, was given to students at the beginning of the course. Additionally, students completed the Kouzes and Posner Student Leadership Practices Inventory (SLPI), a 30-question survey that evaluates the frequency of student leadership practices and behaviors in five areas using a five point Likert scale. Students then completed a three credit introductory leadership course. The LBS and SLPI will be re-administered upon completion of the course. Changes in pre- and post-course survey scores will be compared using a paired student t-test with statistical significance defined a priori as p < 0.05. Students will also be asked to evaluate how well the course met its pre-defined learning objectives. Results: Seventeen of 25 students invited to participate in the class enrolled and completed the initial surveys. All 17 enrolled students are expected to complete post-course surveys. Implications: The development of future leaders in pharmacy is imperative to the continued success of the profession. If leadership skills can be learned, potential leaders in colleges of pharmacy should be given the opportunity to further develop these skills. This project evaluates the impact that a leadership course may have in the development of future leaders for the pharmacy profession.

Impact of Technology-based Case Conference Workshop on Student Learning, Problem Solving Skills and Satisfaction. Vinita B. Pai, The Ohio State University; Katherine A. Kelley, The Ohio State University. Objectives: To assess impact of technology-based delivery of case conference workshop (CCW) on student learning, problem solving skills, and satisfaction. Methods: A new CCW format was adopted wherein students received and completed patient cases and received immediate performance feedback in class instead of preparing the case prior to class and waiting for instructors to grade and return their cases. Students accessed cases via an online course management system. Cases were presented in a multiple choice question-answer format and required students to utilize their PDAs. Student satisfaction and perceived impact on learning were measured via end-of-quarter surveys. Based on feedback from 2006, format improvements will be made for the 2007 course offering, and the survey will be repeated. The impact of technology on student learning and problem solving will be compared across 3 years of the course offering comparing learning outcomes (via exam responses) between the two different formats. Results: The response rate was 95% (107/112). A majority of the students (73-80%) agreed/strongly agreed that technology enhanced format of CCW increased their critical thinking and problem solving skills. Students reported (80-88%) that the new format provided them the opportunity to apply their knowledge to patient care in a limited amount of time (think on their feet), receive immediate feedback on their performance, learn from each other by working in groups, and increase their confidence in their ability to use technology to problem solve during their advanced experiential rotations. An analysis of problem solving skills will be presented based on exam responses.

Implementation and Evaluation of a Comprehensive Clinical Skills Practicum in Pharmacy Practice. Susan W. Miller, Mercer University; Laurel E. Ashworth, Mercer University; Gregory V. Stajich, Mercer University. Performance-based teaching and assessment are methods that allow educators to focus on clinical skills rather than simply clinical knowledge. Performance-based methods provide an opportunity to teach and test the mixture of knowledge, skills, and attitudes that are integral to health professionals’ work. For the academic year, 2006-2007, and based on the recommendation of a task force, the Faculty at the College of Pharmacy and Health Sciences approved the implementation of a comprehensive skills based practicum in the spring semester of the third professional year. The practicum is totally skills based; having students demonstrate clinical skills relevant to the practice of pharmacy, to a member of the faculty in the Department of Clinical and Administrative Sciences and prior to entry into the P4 Advanced Pharmacy Practice Experiences. Students completing a comprehensive skills practicum as a part of a required course in the P3 pharmacy curriculum were asked, via a pre-test, to self assess their mastery of several clinical skills relative to the practice of pharmacy. Following completion of the clinical skills practicum, the students were asked, via a post-test, to complete a reflective assessment of their preparedness for, and performance on, the clinical skills practicum. Data from the questionnaires will be reported via descriptive and comparative statistics. Qualitative content analysis will be used to report the reflection pieces of the post-test in a table format. The information gained from this study will be used to make improvements in the assessment of clinical skills in pharmacy students.

Implementation of Introductory Pharmacy Practice Experiences in the Community Setting. Karla T. Foster, Mercer University. Background: Mercer University College of Pharmacy and Health Sciences implemented a newly revised Introductory Pharmacy Practice Experience (IPPE) program in the community pharmacy setting in the Fall 2006. This program was designed in accordance with the IPPE guidelines set forth by the Accreditation Council for Pharmacy Education. Objective: To describe the implementation of community pharmacy IPPEs in a doctor of pharmacy program. To assess the attitudes of students and IPPE preceptors regarding the content and administration of the community IPPEs. Methods: Completion of the community IPPEs is a requirement in the first professional year, of four, as part of a course titled Practice of Pharmacy. Students are assigned to the IPPE for 14 weeks, 4 hours per day. Preceptor criteria, IPPE outcomes, preceptor training materials and an oversight committee were established. On-site training was provided. A questionnaire containing attitudinal items about the content and administration of the IPPEs was developed and administered electronically to IPPE preceptors and students participating during the 2006-2007 academic year. A 5-point Likert scale where 1 = strongly disagree was provided for responding. Student and preceptors responses were compared using t-tests. Results: The design, content and administration of the community IPPEs appeared successful. Responses from preceptors and students are currently being analyzed to confirm this initial finding. Conclusions: Clearly established outcomes, training of preceptors and responsive oversight are key to the success of a meaningful community IPPE program.

Implementation of Live Journal Club Sessions to Teach Literature Evaluation in a Pharmacy Distance Pathway. Amy Friedman Wilson, Creighton University; Cathy L. Bartels, Creighton University; Morgan L. Sperry, Creighton University; Philip J. Gregory, Creighton University. Objectives: Literature evaluation skills are critical to the development of a competent pharmacy practitioner. Since implementation of the Drug Information and Literature Evaluation course in the Creighton University School of Pharmacy and Health Professions Distance Pathway, these skills have been difficult to teach in a virtual environment. Faculty and student evaluative comments have indicated significant barriers to teaching these skills without the benefit of direct, one-on-one communication. In an effort to improve proficiency in these abilities, mandatory real-time journal club discussions were implemented for this course in the Distance Pathway. Methods: Students were required to sign up for weekly one-hour online sessions during the literature evaluation portion of the course. Each session was moderated by a faculty member and facilitated via iLinc™ web conferencing software. Varied days and times were offered to accommodate time zone and personal scheduling conflicts. Each week students were expected to read and critically evaluate an article, discuss assigned key teaching points during the online session, and submit an electronic summary of their work. Results: Evaluative data have shown favorable student reviews of the teaching method. Students have commented that the online discussion format positively impacted the development of literature evaluation skills. Additional evaluative data and descriptive statistics will be presented. Implications: The implementation of mandatory, real-time discussion groups into the Distance Pathway pharmacy curriculum has resulted in favorable student responses. Additional opportunities for similar delivery methods in other coursework should be explored.

Integration of Substance Abuse Education Through Community Outreach Program to Pediatric Elective Coursework. Kelly L. Matson, University of Rhode Island; Tara A. McCabe, University of Rhode Island. Objective: The objective of this activity is to enhance pharmacy and high school students’ substance abuse knowledge, as
well as, develop communication and assessment skills of pharmacy students through a community outreach project. Methods: In randomly assigned groups, students will prepare and present a resistance education program based upon an assigned drug of abuse to the junior class enrolled in health education at a local high school. Educational programs will be limited to a 10- to 15-minute oral presentation using a creative format (i.e., video, lecture, skit, etc.) with use of visual aids and student participation in interactive activities. Project outcomes will be assessed by baseline and follow-up questions regarding both pharmacy and high school students’ knowledge and perspectives of substance use. In addition, pharmacy students will be tested based on faculty-developed questions and assessed based on peer evaluation for their contribution to the overall project. Results: The outcomes will be collected and analyzed at the end of the 2007 spring semester. Implications: This teaching tool is designed to enhance pharmacy students’ substance abuse knowledge base, communication, peer assessment, and team building skills when dealing with a mandatory group assignment. Furthermore, by the students presenting self-learned materials, it will not only enhance their knowledge and skills, but provide them a leadership opportunity as role models to adolescents. Additionally, high school students will benefit from learning about substances and their abuse potential by older peers through an interactive program.

Integrated Approach to Community Pharmacy Medication Therapy Management (MTM) and Doctor of Pharmacy Experiential Programs. Linda Catanzaro, University at Buffalo; Peter M. Brody Jr., University at Buffalo; Terrance J. Bellnier, University at Buffalo; Karl D. Fiebelkorn, University at Buffalo; Gene D. Morse, University at Buffalo. Background: The goal of the University at Buffalo (UB) MTM Initiative is to develop novel approaches for the provision of pharmaceutical care in community pharmacy practice. The program was developed to provide an integrated model of academic mentoring with a network of highly motivated community pharmacists to facilitate their ability to provide MTM and also foster new models for longitudinal community pharmacy practice student experiences. Methods: In 2006 an 8-hour ACPE-accredited Preceptor Development Program was initiated to train community pharmacists to integrate an MTM model into their ongoing practice. The UB process for student performance evaluation in Advanced Professional Practice Experience was also included. Pharmacy practice faculty provided the initial training and instituted a continuing quality assurance program with a weekly “Pharmacy Rounds” at the UBPharmaco- therapy Information Center. Results: Sixteen community pharmacists completed the program. Thirteen of these are currently precepting a total of 32 students throughout the spring 2007 semester. Educational components included the use of clinical documentation tools, small group preparation of pharmaceutical care plans and case presentations, and peer evaluation. A preceptor survey tool has been developed to measure satisfaction with training and experience as well as quantification of MTM activities. Student evaluations provide an outcome measure for student satisfaction with the preceptor and site. Conclusions: The educational goals of the doctoral experiential program provide an efficient mechanism for introducing MTM algorithms into community pharmacy practice. The regional network will result in enhanced community-based mentoring while also defining the outcomes associated with reimbursement for medication management.

InterSession Course: Interdisciplinary Education by Pharmacy and Medical School Faculty. Michelle L. Cudnik, Northeastern Ohio Universities; Patrick J. Gallegos, Northeastern Ohio Universi-
references to continuing professional development (CPD). One of these references incorporates CPD as part of the student pharmacist’s education. Methods: Albany College of Pharmacy (ACP) developed a plan for implementation of CPD in our curriculum. CPD was introduced in the Foundations of Pharmacy course, a required course for our second (of six) year pharmacy students. Drawing upon previous lessons regarding the habits of a professional, including self-regulation, the elements of reflection, planning, acting and evaluating one’s experience were presented. Recognizing that their plan was fixed by the curriculum, a review of the curriculum was included as part of the lecture. Students were asked to reflect upon their academic history, examining what contributed to, and detracted from, their academic success at this point in their career. This reflection was recorded in Blackboard. Students developed plans for using this reflection in the current semester. The student’s evaluation of his/her plan at the end of the semester will be the final examination. Results: Plan evaluations will be rated as: Demonstrated Reflection, Suggestive of Reflection; and Completed Task. Implications: Introducing CPD at an early stage may allow for academic insight and professional growth. Additional hallmarks where students will reflect on and plan their entire academic career will be incorporated into their experience: preparation for the White Coat Ceremony; selection of elective and APPE courses; selection of topics in their required seminar courses; evaluation of the seminar experience; and their APPEs.

Introduction of a Simulated Electronic Medical Record to a Pharmacy Curriculum. Stuart J. Beatty, The Ohio State University; Julie E. Legg, The Ohio State University; Jonathan Gladden, The Ohio State University. Objectives: Introduce a simulated electronic medical record into required courses of a pharmacy curriculum and determine student perceptions of its implementation and future use. Methods: Doctor of Pharmacy students enrolled in their second year of required professional courses received an initial survey to assess student exposure to inpatient electronic medical records. For two consecutive quarters, students were exposed to a simulated electronic medical record (EMR) for case-based discussions and assignments. The simulated EMR is a web-based tool in which students can navigate through patient case scenarios. The EMR web application is scripted in ColdFusion and a database for the system was established in PostgreSQL. Students were able to electronically navigate through Progress Notes, Physician Orders, Nursing Notes, Labs, Procedures, MAR, Policies, and Outpatient Notes. Instructors can selectively release information into the EMR using an administrative control panel. Students were exposed to simulated cases in Pathophysiology and Therapeutics courses and one longitudinal case in an introductory laboratory experience. Students will be asked to complete a survey at the end of Spring Quarter 2007 to assess perceptions on the use of the simulated EMR in didactic exercises. Results: Survey responses will be compiled for data analysis following Spring Quarter 2007. Survey results will be analyzed to determine student perceptions of the simulated EMR. Implications: Study results will be useful when determining if a simulated EMR should be incorporated into other portions of the curriculum. Future uses of the simulated EMR may include expanded case assignments and written communication exercises.

It’s Performance That Counts: Shifting Student Focus from Letter Grades to a Patient Care Focus. Kelly L. Scolaro, University of Florida; Thomas O. Munyer, University of Florida; Renee L. Rose, University of Florida; Lisa D. Inge, University of Florida. Objective: Describe assessment mechanisms in active learning pharmacotherapy courses. Methods: Pharmacotherapy (PTX), a performance based series, focuses on student driven learning. There are no lectures in PTX. Instead role-playing and Socratic questioning are used to develop competence and confidence in clinical situations. Performance assessment uses standardized forms. Videotaped sessions are posted on WebCT and students complete self-evaluations and peer evaluations online. Areas of evaluation include: accuracy, terminology, confidence, empathy and professionalism. In an effort to improve professionalism and performance in clinical situations, assessment mechanisms have changed. In the Fall of 2005 “yes/no” questions were added to the performance and group peer-evaluations that addressed trust in the future clinicians and the ability to work with a team. Comments to support yes/no choices are required. Fall 2006 assessments were changed from a letter grade system to a system with the following designations: “Excellent (Rare), Very Good, Acceptable, Needs Improvement, and Wasn’t Prepared”. Students no longer receive letter grades on their performances, written assignments, or peer evaluations. Evaluations and feedback are accessed via WebCT. Results: There has been significant adjustment to the new assessment system for faculty and students. Students were very uncomfortable with this seemingly “unorthodox” method of assessment. Grade data from 2005 and 2006 showed significantly more “C” grades (1% vs. 22%). A survey of the students will be conducted at the end of Spring 2007 to assess the impact of this new system. Implications: Adjustments to assessment systems in PTX may move students from grade focus toward patient care focus.

Large Group, Problem-Based Approach to Applying the Pharmaceutical Care Model to a Nonprescription Medication Course. Melody H. Ryan, University of Kentucky. A systematic approach to solving patient problems is a necessary skill for pharmacy students. Traditional problem-based learning (PBL) emphasizes learners taking responsibility for learning, developing literature evaluation skills, and integrating information to solve problems. While our faculty value these skills, adopting PBL was thought to be too time and resource-intensive. Large group, problem-based learning has been successfully employed for third professional year therapeutics courses, but no reports describe use earlier in the curriculum. Our faculty have adopted pharmaceutical care as a practice model and the model is taught in the laboratory sequence of the curriculum. Objective: To develop, implement, and evaluate a large group problem-based course for non-prescription medications. Methods: A pedagogy incorporating problem-based methodology and the pharmaceutical care model was developed for a two-semester, first professional year non-prescription medications course. Students will evaluate this course methodology with standard course evaluations, through focus groups, and with specific questionnaires related to this teaching approach. Results: The evaluation results and instructor-identified barriers to use of this method will be presented. Implications: Results will provide insight into the usefulness of large classroom setting-PBL early in the pharmacy curriculum. The large classroom format will become increasingly important as colleges of pharmacy increase enrollment and struggle to design curricula that emphasize critical thinking and life-long learning. The early introduction of critical thinking skills early in the educational experience sets the stage for solving intermediate and complex patient problems later in the curriculum.

MedSense, an Academic Medication Management Program in a Primary Care Group Practice. Erin M. Slazak, University at Buffalo; Nicole M. Paolini, University at Buffalo; Mark J. Wrobel, University at Buffalo; Scott V. Monte, University at Buffalo; Arthur E. Orlick, Lifetime Health Medical Group; Cynthia A. Ambres,
Meeting the Goals of Healthy People 2010 Through Community-Campus Partnerships. Gina M. Carbonara, West Virginia University; Mary K. Stamatakis, West Virginia University; Kimberly G. Colebank, West Virginia University; Carla J. See, West Virginia University. Intent: To develop and implement service learning projects with second year student pharmacists that meet objectives of Healthy People 2010 through collaboration with a community partner and the University’s Center for Civic Engagement. Objectives: To: (1) develop, implement, and assess a service learning project, (2) instill the values of community service, (3) apply didactic knowledge in disease prevention and health promotion, and (4) enhance oral and written communication skills. Methods: Prior to the year long service learning project, first year student pharmacists are introduced to service learning and the missions of local agencies, attend an information fair during which a medication and disease state history are taken. Patients are then provided with a medication review that they may self-implement and their physician is provided a pharmacotherapy consult. Results/Outcomes: Between February 2004 and January 2007, 165 patients (68 male, 97 female) have been enrolled. The majority of patients are identified by their physician, most commonly for management of diabetes mellitus and/or complex regimens. At enrollment, patients are taking an average of 9.5 medications and 80% require at least one follow-up session. The mean patient age is 63.8 years. Medications most commonly requiring management include oral antidiabetics, insulin, antihypertensives, and antihyperlipemics. Implications: The success of MedSense and its acceptance by patients, physicians, and staff at Lifetime Health Medical Group underscores the need for a collaborative team approach to pharmacotherapy. This program has served as a model for other university/health care center collaborations across Western New York and is also an ideal setting for implementation of Medication Therapy Management programs.

Motivating Factors Influencing Choice of Major: A Comparative Survey Analysis of Pharmacy vs. Non-pharmacy Students. Flora Keshishian, St. John’s University; Joseph M. Brocavich, St. John’s University; Somnath Pal, St. John’s University; R. Thomas Boone, University of Massachusetts at Dartmouth. Objective: To assess factors, motivations, and non-academic influences that affect the choice of major in pharmacy vs. non-pharmacy college undergraduate students. Methods: In Fall 2005 and Spring 2006, survey questionnaires were given to faculty members to administer in their Speech classes. Participants included students enrolled in two core courses at St. John’s University (Jamaica, NY): one (Interpersonal Communication for the Pharmacist) and another (Public Speaking) for all other majors. Both courses are routinely taken during freshman or sophomore years. The focus of this written survey was primarily on pharmacy students. However, a broad range of undergraduates were included in the sample to help determine what differentiated pharmacy students from students who selected other majors. Variables being analyzed included gender and cultural background. Participation in the study was anonymous and strictly voluntary. Results: A total of 618 questionnaires were distributed. Of these, 553 (89.5%) were completed and included in the analysis. The Study group consisted of 215 (38.9%) Pharmacy majors and 321 (58.2%) other majors (1.1% School of Education, 23.2% College of Professional Studies, 19.2% St. John’s College of Liberal Arts & Sciences, 14.7% Tobin College of Business). The breakdown by gender was 47.9% Male and 52.01% Female; by ethnicity, 37.6% was White and 32.7% Asian. Comparison of multiple variables including impact of culture, student perceptions and nonacademic influences will be presented. Implications: Results of this survey will provide further insight into those variables that influence the selection of Pharmacy as program of study.

Online Delivery of an Immunization Delivery Certificate Program to First-Professional Year Student Pharmacists. Amy R. Donaldson, Auburn University; Erika L. Klepperger, Auburn University. Objectives: First professional year student pharmacists at the Harrison School of Pharmacy are required to complete the APhA Pharmacy-Based Immunization Delivery Certificate Program. An online delivery method for presenting the majority of this certificate program was developed in order to maximize student time spent in the skills lab and to promote self-directed learning. Methods: Over 10 weeks, students were provided with four online two-hour faculty narrated slide presentations followed by two two-hour “live” lab sessions. Students were given two weeks to view each presentation and complete a web-based quiz. An online discussion board was created and monitored by participating faculty to provide a forum for students to discuss material and ask questions. Two lab sessions were held to practice reading immunization schedules through case discussion and to review immunization administration technique. Supplemental review sessions were also held by students who had previously completed the training. In order for students to successfully complete the course, each must achieve an average of 70% on four quizzes, score at least 70% on the final exam, and demonstrate competence with intramuscular and subcutaneous injection technique. Results: A program assessment will be completed upon conclusion of the program to determine student satisfaction with the delivery method. Student performance will also be compared to students who completed the program last year when the material was presented in five two-hour live class sessions. Implications: An online delivery method allows students to self-pace their learning and allows more time for emphasis on skills development.
Oral proficiency criteria used by pharmacy faculty for non-native speaker pharmacy students. Susan Jacobson, Massachusetts College of Pharmacy and Health Sciences – Boston; Timothy R. Hudd, Massachusetts College of Pharmacy and Health Sciences–Boston; Christine A. Parkhurst, Massachusetts College of Pharmacy and Health Sciences–Boston. Objective: To describe oral proficiency criteria used by pharmacy faculty and to develop a working definition of a threshold level of oral proficiency for non-native speaker (NNS) pharmacy students. Methods: Audiotapes and computer sound files of representative NNS pharmacy students performing patient counseling role plays will be played and reviewed by fifteen faculty from the School of Pharmacy. The faculty will evaluate student performance using a draft rubric developed in previous research and will describe their evaluation criteria and process by answering open-ended questions. Their evaluations will be analyzed and compared with a linguistic evaluation of phonemic, grammar, vocabulary and register (speech style) errors on the tapes/sound files. Results: The results describe the evaluation process used by faculty. The investigators will develop a working definition of a threshold level of oral proficiency based upon faculty evaluation of student performance. In addition, a revised rubric will be produced describing acceptable and unacceptable levels of oral proficiency. Implications: Discussion of this description and rubric will help pharmacy faculty agree on a valid and reliable definition of oral proficiency for NNS pharmacy students. Faculty and NNS students will know the features of this threshold level and what level of proficiency students must achieve.

PA Coalition Preceptor Training Program: Enhancing Preceptors’ Development Skills. Abir (Abby) A. Kahaleh, Lake Erie College of Osteopathic Medicine; Janet Astle, Duquesne University; Susan M. Meyer, University of Pittsburgh; Steven L. Sheaffer, University of the Sciences in Philadelphia; Lisa M. Becker, Temple University; Bernard W. Graham, Wilkes University; Rebecca Finely, Thomas Jefferson University. Objectives: The purpose of the PA Coalition initiative is to develop a state-wide preceptor training program to enhance the quality of experiential education, improve preceptors’ teaching skills, enhance their clinical skills, and combine resources among the schools of pharmacy in the state. Process: To better meet the ACPE Standards of 2007, the seven schools of pharmacy convened to identify strategies for addressing the needs of the preceptor and schools of pharmacy. The schools have been meeting monthly at state and national meetings, including the AACP Experiential Institute. The schools further cooperated with the Pennsylvania Pharmacists Association (PPA) and the Pennsylvania Health-System Pharmacists (PSPH) to implement the preceptor training program. The schools will be providing the first live presentations in the fall of 2007 at the PPA & PSPH meetings. The schools will also utilize resources that were identified by the AACP PEPSIG through the Academic Practice Partnership Initiative. A working group was identified from each school in PA to determine the preceptor training program content and format. Outcomes: In addition to the training program, the coalition has been successful in securing external funding to provide programs to facilitate the advancement of practice pharmacy. The PPA and PSPH were supportive in offering CE programs at their annual meetings. The ultimate goal of the collaboration is to provide educational programs while combining resources among the schools. Implications: This is a long-term plan for the PA schools of pharmacy to improve the quality of experiential education and enhance preceptors’ practice skills.

Perceived Stress and Health-Related Quality of Life of Doctor of Pharmacy Students: A Pilot Study. Leisa L. Marshall, Mercer University; Diane Nykamp, Mercer University; Amy E. Allison, Mercer University. Objectives: To determine the level of perceived stress, strategies employed to ameliorate stress, and mental and physical health-related quality of life (HRQOL) among a sample of doctor of pharmacy students. Methods: All third-year pharmacy students were invited to participate in an Institutional Review Board approved study examining stress at two time points during the academic year while students were in required pharmacotherapy modules. The Perceived Stress Scale (PSS), a 14-item validated scale by Cohen, was used to measure stress level and reactions to stressful situations. The validated Health Outcome Short Form version 2 12 item survey, SF-12 HRQOL, was used to measure mental and physical HRQOL. A Personal Survey instrument was designed and used to gather demographic data and strategies students employed to ameliorate stress. Results: Participants were surveyed Fall 2006 and will be surveyed again Spring 2007. Responses were anonymous, but surveys were numbered. Implications: Correlations will be examined between the PSS, SF-12 HRQOL, and Personal Survey results for Fall 2006 and again for Spring 2007. Results on the PSS and SF-12 HQROL will be compared by different groups from the demographic data from the Personal Survey - gender, G.P.A. ranges, and hours employed outside of school. Common strategies employed to ameliorate stress will be reported, including those with positive and negative impact on overall health. Study results may be of interest to other academicians since ACPE Standards for the Curriculum No. 15 indicates that curricular assessment should include measurement of perceived stress among students.
Periodic Asynchronous Online Instruction to Enhance Long-term Cardiovascular Drug Knowledge. Michael Crouch, Virginia Commonwealth University. Objective: To assess if online learning that bridges didactic and experiential training enhances long-term cardiovascular drug knowledge. Methods: Data are from quizzes as part of two courses. In the first course (third-year cardiology elective), students complete eight online lectures (drug-focused) and related quizzes (10 questions each). Online time replaces classroom time. Students also take one unannounced quiz (collection of all online quizzes) at the beginning or end of the course to assess drug knowledge. In the second course (fourth-year cardiology clerkship) students take one unannounced quiz (collection of all online quizzes) at the beginning of clerkship. Based on quiz results, the preceptor identifies specific online lectures the student should review. ANOVA compares mean sequential quiz grades and a t-test will compare clerkship grades between those that did and did not take third-year online lectures. Results: Of the assessed students (n = 80), a large majority (>97%) agreed or strongly agreed the approach has a reasonable workload (time requirement and difficulty), is practically applicable, stimulates interest, is easy to use, and should continue as part of the third-year elective. Compared to baseline scores (47.1%), higher mean quiz grades occurred directly after online lectures (94.1%), at the end of the third-year elective (72.1%), and on clerkship (73%; p < 0.001). Ongoing analysis will compare clerkship quiz grades between students that did and did not take the third-year elective. Implications: Periodic asynchronous online instruction is an effective educational strategy and well received by students. Continuing study will determine if third-year online lectures enhance long-term cardiovascular drug knowledge.

Pharmacotherapy Management Program: Development and Initial Outcomes in a Multi-Specialty Physicians Group. Nicole M. Paolini, University at Buffalo; Holly Coe, University at Buffalo; Irene S. Snow, Buffalo Medical Group; John Notaro, Buffalo Medical Group; Gene D. Morse, University at Buffalo. Objectives/Intent: The Buffalo Medical Group (BMG) and the University at Buffalo (UB) School of Pharmacy and Pharmaceutical Sciences have collaborated to implement an evidence-based medicine Pharmacotherapy Management Program (PMP). The objective of the PMP is to develop novel models of pharmaceutical care management that achieves optimal clinical and economic outcomes for BMG patients. Methods/Process: There are several program outcome measures designed to tailor the PMP to the needs of BMG and the community it serves. These outcome measures can include educational, clinical, and economical. The PMP engages in one-on-one pharmacotherapy consultations and patient education consultations. During consultations, interventions are made directly with the patient, recommendations are made to the provider and outcomes are collected by the PMP investigators. Results/Outcomes: To date, 138 patients have been referred: 58 for pharmacotherapy consultations and 80 for patient education consultations. Ninety-nine (72%) patients were referred to the PMP for diabetes; fifteen (11%) for drug-related problems; the remainder 24 (9%) for cholesterol, blood pressure, and anticoagulation management, and cost-related issues. The PMP made an average of two recommendations/interventions per patient. These recommendations included education (29 recommendations made/29 recommendations accepted); lab test recommendations (10/4); recommending a drug be added (24/14) or removed (15/9); recommending a dose be increased (8/6) or dosage form be changed (4/3). The overall acceptance rate of PMP recommendations by the provider was 72%. Implications: The PMP provides a novel practice model for monitoring clinical and economic impact on all health care facets including drug cost and utilization. Analysis of the data will provide evidence for the inclusion of PMP in the BMG health care delivery model and support reimbursement models for long-term pharmacist recommendations/interventions in controlling health care expenditures.

Pharmacy Socialization, Self Efficacy and Skills: Measuring Differences Based on Cooperative Education as the Intervention. Mark L. Yorra, Northeastern University. Objective: The study is to determine if there are measurable differences in pharmacy professionalization, self-efficacy and skills in two schools of pharmacy: one using a cooperative education model and one using a traditional school year model. Methods: Surveys were administered to the Doctor of Pharmacy Class of 2010 at Northeastern University (which uses the co-op model) in May 2006, prior to starting their first co-op experience in the summer and the P1 year. Surveys were also administered to students at a traditional school of pharmacy in the Class of 2010 in the beginning of their P1 year in September 2006. A second survey measuring professional socialization, skills and a retest of self-efficacy will be administered to the students at each school during their P2 year in January 2008. This is the point after the co-op interventions are completed and prior to their similar P3 and P4 years. The results will determine if the co-op program structure results in differences in professional socialization, self-efficacy and skills at this point in the curriculum. Results: Initial baseline data on demographics, reasons for selecting pharmacy and initial self-efficacy results are summarized. Implications: If the structure of a cooperative education program is shown to increase the measured parameters of professional socialization, self-efficacy and skills as compared to a traditional program, some of the components can be extrapolated to all schools of pharmacy for inclusion in their pharmacy introductory pharmacy practice experiential programs.
Pharmacy Student Experiences With Gambling: A Survey of Attitudes, Exposure and Impact. Gary N. Elsasser, Creighton University; Michael G. Kavan, Creighton University; Gary H. Westerman, Creighton University. Objective: Assess the extent and characteristics of gambling among pharmacy students. Methods: Six hundred and fifty-eight pharmacy students enrolled in the campus and distance pathway were emailed notification of a survey whose purpose was to identify the extent and characteristics of gambling among participants. Students accessed the 29-item, modified South Oaks Gambling Screen as an on-line survey via an embedded link within the email notification. The email as well as the survey itself advised each student of the anonymity and confidentiality of the survey results. Email reminders for non-responders were sent at weekly intervals for four weeks. Results: Four hundred and eighty-nine students (74.3%) responded (60.1% of campus, 67.6% distance). The mean age of responders was 26.3 years with 63.2% female. Almost two-thirds (63.7%) of participants reported as having gambled at least once during the past 12 months with 20% as having wagered $100 or more in a single day. While only one student admitted to believing they have a gambling problem, 14 students reported their gambling had a negative impact on school work and relationships. Furthermore, 17 respondents reported being criticized about their gambling or had been told they had a problem. Implications: Gambling is a common activity among pharmacy students and should be considered as a possible factor for students who develop academic or social difficulties. Finally, students do not appear to have a realistic perception of what constitutes “problem gambling” and may benefit from programs addressing this issue.

Pharmacy Students and Faculty Baseline Perceptions of Cultural Competency Issues. Whitney L. Unterwager, Mercer University; Gina J. Ryan, Mercer University; Lisa M. Lundquist, Mercer University. Intent: To assess and compare the current level of perceptions of pharmacy students and faculty regarding cultural competency issues. Process: An on-line questionnaire will be sent to all professional year one through four students and pharmacy faculty to determine perceptions on how cultural differences affect pharmacy practice. The questionnaire will focus on issues such as the need for cultural sensitivity, benefits of cultural sensitivity to patients and other healthcare professionals, the need for foreign language resources and multi-cultural awareness, and the impact on cultural differences on healthcare. Outcomes: The results of each class’s questionnaires will be compared to determine if cultural competency changes as students matriculate through the curriculum. In addition, demographic data such as age, sex, language skills, country of birth, and ethnicity will be used to evaluate if differences exist among these categories. Faculty questionnaire results will also be evaluated to determine the perception of cultural competency in this group. Implications: Cultural competency is an important issue that must be addressed in the pharmacy curriculum per ACPE accreditation standards. Cultural sensitivity and multi-cultural awareness will help the pharmacist provide patient centered care and improve medication therapy management. If deficits in cultural competency are detected, curricular changes and faculty development will be implemented to address these issues.

Pharmacy Students’ Perceptions of Learning from a Cultural Competency Module. Jasmine D. Gonzalvo, Purdue University; Kimberly Plake, Purdue University. Objectives: To assess first professional year pharmacy students’ perceptions of learning from a cultural competency module. Methods: Pharmacy students (N = 160) participated in a cultural competency module, which introduced concepts related to cultural diversity in healthcare settings and patient care. The cultural competency module included 2 hours of lecture and a 3-hour pharmacy practice laboratory. During the lab period, students participated in a variety of activities, including self-reflection of personal culture, discussion of DVD clips describing cultural considerations in a healthcare setting, and counseling simulations. The goals of these activities were to help students identify personal biases and heighten their awareness of cultural issues. At the conclusion of each activity, students had time to express personal opinions to stimulate class discussions. Students completed surveys prior to and after the pharmacy practice lab. The survey included four main sections: 1) communication skills, 2) personal values and attitudes, 3) feedback about the lab, and 4) final comments. Results: Existing evaluations of the cultural competency module will be reviewed to assess student perceptions about culture before and after participation in the cultural competency module. As a part of this evaluation, students’ survey responses will be compared. This information will allow interpretation of new insights into cultural diversity and its impact on students’ attitudes and learning. Implications: Faculty within colleges of pharmacy will potentially gain further insight into effective implementation of a cultural competency module in a Pharm.D. curriculum. Furthermore, areas for improvement may be identified to enhance the lecture content and integrated lab experience.

Pharmacy Students’ Reflective Feedback on Interprofessional Geriatric Team Assessments. Ann M. Ryan-Haddad, Creighton University; Kelli L. Coover, Creighton University; Michele A. Poeppeing-Faulkner, Creighton University. Objective: To evaluate students’ qualitative feedback from their interprofessional team assessments of geriatric clients. Methods: Second and third year pharmacy students enrolled in an elective geriatric pharmacy course were teamed with occupational therapy and physical therapy students to assess volunteer geriatric residents in assisted living facilities. Students were asked to answer reflective questions after the initial team introductions and patient assessments, and after the final care plan team meetings. Reflective questions focused on students’ perception of the roles of other disciplines, what effect the interprofessional interactions had on their perceptions, and whether the interactions could improve patient care. The course’s final exam included reflective questions on students’ ability to contribute to the team’s care plan and preparation to work with other health professions students. Results: Pre- and post- qualitative data regarding students’ understanding of the roles of other disciplines and the impact of interprofessional interaction on patient care will be presented. Implications: Data obtained from student feedback will allow the instructors to determine what changes may be needed to further enhance the interprofessional experiences.

Predictors of Academic Difficulty at the University of North Carolina School of Pharmacy. Helen Smith, Welsh School of Pharmacy, Cardiff University; Wendy C. Cox, The University of North Carolina at Chapel Hill. Objectives: Predictors of academic difficulty could prove just as valuable as predictors of academic success. However, little is reported in the literature on predictors of academic difficulty at schools of pharmacy, with many studies focusing on predictors of success with conflicting results. The objective of this study was to identify predictors of academic difficulty at the University of North Carolina at Chapel Hill School of Pharmacy. Methods: Students who experienced academic difficulty (defined as going before the Progressions Committee) over a five year period between Fall semester 2000 and Spring semester 2006 were compared with all other students enrolled in the School of Pharmacy during this time. Descriptive statistics and regression analyses were used to assess the correlation
Predictors of Readiness for Self-directed Learning Among Fourth Year Student Pharmacists. Donna D. Huynh, University of Maryland; Stuart T. Haines, University of Maryland; Deborah Sturpe, University of Maryland; Cherokee Layson-Wolf, University of Maryland; Kristin Watson, University of Maryland; Cecilia M. Plaza, American Association of Colleges of Pharmacy. Objectives: Since self-directed learning is believed to promote lifelong learning, both ACPE and ACCP recommend its adoption during the experiential learning component of pharmacy education. Self-directed learning is dependent upon the students’ ability to conduct self-assessments, develop learning plans, and evaluate their own learning. The objective of this study is to determine the self-directedness of fourth year student pharmacists and to identify characteristics that are associated with readiness for self-directed learning. Methods: The Self-directed Learning Readiness Scale (SDLRS) and Baseline Characteristics Survey (BCS) were administered to fourth year student pharmacists in February 2007 midway through their advanced pharmacy practice experiential rotations. SDLRS is a validated scale that determines the relative degree to which students have the attitudes and motivation to engage in self-directed learning. The BCS provides data on demographics, pre-pharmacy coursework, elective interests, and leadership skills. A comparison of proportions will be used to determine which baseline characteristics are most associated with readiness for self-directed learning. Results: The number and percentage of student pharmacists as well as variables associated with high and low levels of readiness for self-directed learning will be reported. Implications: This study will provide information regarding the characteristics of self-directed learners and help identify students who may benefit from instruction regarding self-directed learning habits.

Programmatic Identity and Standards 2007: Self/Peer Assessment of Three Service-learning/Community Engagement Programs. Eric H. Hobson, South University; Ruth E. Nemire, Nova Southeastern University; Sharon K. McDonough, Auburn University; Patrick D. Brackett, Auburn University. Purpose: Develop and test a pharmacy education-specific self and peer assessment process for service-learning/community engagement programs. Methods: Changes in accreditation standards for experiential education in pharmacy led Auburn University, Harrison School of Pharmacy, Nova Southeastern College of Pharmacy and South University School of Pharmacy to collaboratively develop and test programmatic assessment rubrics for service-learning/community engagement activities. Using the service-learning/community engagement literature, information presented at two AACP Institutes, feedback from participants at the 2007 AACP Interim Meeting, and ACPE Standards 2007, service-learning/community engagement directors and assessment directors developed and refined two program assessment rubrics (holistic & primary-trait). The three programs beta tested the tool via peer and self-assessment to determine strengths/weaknesses and to guide further tool development and process refinement. Results: This poster presents the tool’s development history, reviews responses to its initial use, forecasts next steps in tool refinement, discusses the development of ancillary program-improvement materials, and discusses plans for wider tool dissemination.

Promoting Critical Thinking Skills by Involving Students in a Simulated Guideline Development Process. Reza Taheri, Loma Linda University. Background: Students are often taught guideline driven disease management. However they are seldom introduced to the intricacy, complexity and controversy surrounding guideline development. Intent: To promote critical thinking skills by involving students in all aspects of generating a guideline update. Process: A major component of an elective course was dedicated to guideline update development. Methodology Manual for American College of Cardiology (ACC)/American Heart Association (AHA) Guideline Writing Committees was published in April 2006. This manual outlines in detail the ten steps involved in the development/update of all ACC/AHA guidelines. With this manual as a guide, class formed a “Guideline Writing Committee” and was given the task of updating guidelines for myocardial infarction (MI). Outcomes: Faculty allocated first 2 steps, which include determining the scope, objectives and assignments. Students utilized extensive drug information skills to sort, evaluate, synthesize and interpret evidence (steps 3 and 4). Steps 5-8 provided experience to compare the weight of the evidence from literature in order to write recommendations, assign classification and strength of evidence for recommendations. To simulate step 9, which involves responding to peer review comments, class presented their final recommendations to faculty for review and critique. The final step involves posting of the document, which will be accomplished after comparison with the MI guidelines due March 2007. Implications: This exercise allowed students to apply their drug information skills, have better appreciation of cardiology literature, challenge each others view points and have theirs challenged by faculty. Finally, it gave students a thorough appreciation for guidelines.

Quality Assurance Program for Pharmacy Practice Experiences using CAPE-Based Capabilities Checklists. Teresa J. Lubowski, Albany College of Pharmacy; Jennifer Cerulli, Albany College of Pharmacy. Objectives: To perform a quality assurance program that assesses both quantitative and qualitative aspects of standardized CAPE outcome based capabilities checklists. Methods: CAPE outcome based capabilities checklists were developed for Community IPPE, Community APPE and Institutional APPE. 5% of IPPE and 10% of APPE sites were randomly selected for Experiential Coordinator visits to determine the level of student involvement (1 = student read or heard about, 2 = student observed, 3 = student performed), level of student achievement (1 = introduced through observation, 2 = practiced at novice, 3 = proficiency at Pharm.D D. level), and site value (1 = educational exercise only, 2 = moderate usefulness, 3 = very valuable) of capability checklist activities. 20% of randomly selected students submitted written samples of work product for qualitative and quantitative assessment and rubric development. Results: Thirty random site visits have been completed from 5/15/06 to 2/15/07. The time to complete the random site visits was 53.23 + 23.83 minutes (25-120 minutes). Students completed 97.46 + 3.46 % required checklist activities. 65% of the reported student involvement outcomes were categorized at level 3- student...
performed. 46% of the student achievement outcomes were categorized at level 3- proficiency at Pharm.D. D. level. 52% of the site value outcomes were categorized at level 3- very valuable. Rubric development is ongoing for qualitative assessment of submitted work. Implications: Students completed the majority of the activities on the capabilities checklist. Random site visit preceptor and student survey information identified areas for improvement in the selected rotations. Student involvement in activities was high with most achieving proficiency in the capabilities.

Readiness for Self-directed Learning and its Association with Traditional Instructional Outcomes. Donna D. Huynh, University of Maryland; Stuart T. Haines, University of Maryland; Deborah Sturpe, University of Maryland; Cherokee Layson-Wolf, University of Maryland; Kristin Watson, Cecilia M. Plaza, American Association of Colleges of Pharmacy. Objectives: As schools and colleges of pharmacy implement instructional methodologies within their curricula to develop self-directed learning habits among student pharmacists, the impact of such habits on learning outcomes needs to be quantified. The objective of this study is to assess the relationship between readiness for self-directed learning and student performance on traditional instructional outcomes of advanced pharmacy practice experiences (APPE). Methods: The Self-directed Learning Readiness Scale (SDLRS) was administered to fourth year student pharmacists midway through their APPEs in February 2007. SDLRS is a validated scale that determines the relative degree to which students have the attitudes and motivation to engage in self-directed learning. Pearson correlations will be used to examine relationships between the SDLRS and scores on preceptor evaluations during clinical rotations, an oral case presentation scored by full-time faculty, a standardized written case management exam, and a composite performance score. Results: Pearson correlation coefficients and associated coefficient of determinations will be reported for the SDLRS and scores on the following: preceptor evaluations, oral case presentation, case management exam, and the composite performance score. Implications: This study will provide insights regarding the predictive value of the SDLRS for academic performance during APPEs as well as baseline information for future studies regarding self-directed learning.

Redesigning a Pediatric Pharmacotherapy Elective Course Focusing on Learner Centered Teaching. Susan L. Drea, Massachusetts College of Pharmacy and Health Sciences – Boston. A traditional lecture-based elective course in pediatric pharmacotherapy was redesigned with the focus on learner centered teaching. Learner centered teaching places the responsibility of learning on the student while the instructor primarily serves as a facilitator of learning. This approach fosters the development of life-long learning skills that are crucial in the health care field. Learner centered teaching is individualistic, competency-based, maximizes student productivity, and promotes professional development. Pediatric Pharmacotherapy, a 3 SH professional elective course, is offered annually in the spring semester to a maximum of 20-25 students. Using the new teaching model, the course is held once weekly for 3 hours. Prior to attending class, students are required to read selected articles that will be applied to problem-solving exercises during class. Students are divided into 5 working groups of 4 to 5 students. In class, each group works collaboratively to solve case-based problems utilizing the required readings and selected pediatric dosing references. In the plenary session, the groups discuss and debate their solutions to the case-based problems, their therapeutic plans for the patients, and the rationales for these plans. Assessments include a midterm, final exam, individual project, and group project with 10% of the grade based on participation. Consistent with learner centered teaching, students select their individual and group projects based on pre-identified professional development goals and the CAPE outcomes.

Regional Collaborations of Offices of Experiential Education for Schools/Colleges of Pharmacy in New England. Philip M. Hritcko, The University of Connecticut; Mary Ann Phaneuf, The University of Connecticut; Peter J. Tyczkowski, The University of Connecticut; Paul DiFrancesco, Massachusetts College of Pharmacy & Health Sciences – Boston; Catherine Basile, Massachusetts College of Pharmacy and Health Sciences – Boston; Ronald A. DeBellis, Massachusetts College of Pharmacy and Health Sciences – Worcester; Jayne Lepage, Massachusetts College of Pharmacy and Health Sciences – Worcester; Debra A. Copeland, Northeastern University; Samuel J. Matthews, Northeastern University; Lorelei Ventocilla, Northeastern University; Kathleen O. Fisher, University of Rhode Island; June T. Spink, University of Rhode Island. Objective: The ACPE Standards 2007 has provided all ACPE stakeholders with a set of guidelines that ensures the excellence, integrity and commitment in pharmacy education. In an effort to achieve these goals the Offices of Experiential Education in the New England region have chosen to collaborate regionally. Methods: Inspired by the New England Regional Dean’s (NERD) group that was formed in 1994 by the Dean’s of their respective New England schools/colleges of pharmacy, the New England Region Departments of Experiential Education (NERDEE) group was formed in the fall of 2005. Membership includes the University of Connecticut, Massachusetts College of Pharmacy & Health Sciences Boston & Worcester, Northeastern University Bouvé College of Health Sciences, and the University of Rhode Island. The NERDEE group meets quarterly to discuss issues pertaining to the execution of both Introductory and Advanced Pharmacy Practice Experiences (IPPE & APPE). In June of 2006, the NERDEE group hosted 14 major chain pharmacies to introduce them to the collaboration. Results: NERDEE meetings focus on sharing “best practices,” developing, executing and reviewing preceptor development programs, as well as exploring opportunities to share resources to solve common challenges in experiential education. Implications: The NERDEE group has observed successes in sharing “best practices”, APPE sites and collaborating on preceptor development initiatives. The NERDEE group plans to further develop corporate alliances within our region to discuss, in one voice, the various challenges facing pharmacy education, especially regarding experiential education. The NERDEE collaboration should serve as a model for other schools/colleges of pharmacy.

Regional Preceptor Perceptions Regarding Experiential Workload and Compensation. Maryann Z. Skrabal, Creighton University; Rhonda M. Jones, Creighton University; Rondall E. Allen, Xavier University; Mitra Assemi, University of California at San Francisco; Cynthia J. Boyle, University of Maryland; Philip M. Hritcko, The University of Connecticut; Abir (Abby) A. Kahaleh, Lake Erie College of Osteopathic Medicine; Ruth E. Nemire, Nova Southeastern University; Teresa A. O’Sullivan, University of Washington; Denise A. Solits, Drake University. Objectives: Increased curricular experiential requirements, increased number of pharmacy schools and increased enrollment in current pharmacy schools have created the need for pharmacy schools to obtain more experiential sites to train pharmacy students. Knowledge and understanding of experiential education loads, quality-time issues, and compensation is necessary as experiential directors are searching for additional quality sites and preceptors. The purpose of this study was to determine regional
differences among preceptor perceptions regarding experiential student loads, educational quality and time issues, and compensation for their time and work with rotation students. Methods: A cross-sectional survey design was used that consisted of both Likert-scale and quantitative questions. The experiential offices of nine different schools/colleges of pharmacy from the Northeast, Midwest, South and West geographic regions administered the survey to their preceptors in various pharmacy practice settings who routinely take students for them. The questionnaire was sent to 4,396 preceptors and assessed the following: number of students precepted, number of schools that sent them students, ability to accommodate all requests for precepting students, reasons for declining to precept students, quality of experiential teaching, and compensation. Results: Descriptive and bivariate statistical analysis according to the geographic regions will be presented. Implications: The results of this comparative assessment will assist pharmacy schools in understanding the relationships within the experiential environment that may affect the search for additional quality experiential sites in different regions across the country.

Reliability and Convergent Validity of Summative Assessments in a Pharmacotherapy Course. Karen D. Dominguez, The University of New Mexico; Kristina M. Wittstrom, The University of New Mexico. Background: Recent changes in the ACPE requirements to demonstrate ongoing assessment of attainment of desired student learning outcomes are intended to be the basis of educational decisions that improve learning and curricula. In order to demonstrate gains in student-learner outcomes, a range of assessment activities can be undertaken. A first step is the determination of current assessment instruments and the related issues of assessment validity, reliability and interpretation of results. Objective: The objectives of this study are to determine if students are being routinely and uniformly assessed for problem-solving abilities and if such assessments are evenly distributed across subject matter within the pharmacotherapy course. Methods: The pharmacotherapy instruction is arranged in a module/block format taught by several faculty members. Each examination question for the course during the academic year of 2006-2007 will be categorized into a modified/collapsed Bloom’s taxonomy consisting of three categories - knowledge, application and problem solving. Student scores for all examination questions will be recorded. Tests for reliability (Cronbach’s alpha) and convergent validity will be performed using SPSS and analyzed for consistency between and within course modules. Results/Implications: A careful analysis of summative assessments across the pharmacotherapy course will identify inconsistencies in assessment instruments. Such identification is the first step in taking corrective measures that will increase student outcomes. This approach may also be used for other courses in the curriculum.

Spirituality and the Pharmacy Student. Bernadette K. Brown, Butler University; Joseph T. Klepe, Butler University; Susan E. Bierman, Butler University. Objective: Faith and spirituality tend to be core beliefs that may impact a student’s decision on choice of major or career path. This study will attempt to determine if and how much one’s spirituality and faith impact these decisions. Methodology: Approval for the study from the Butler University Institutional Review Board was received prior to data collection. An anonymous survey was designed and administered to students enrolled in the Doctor of Pharmacy curriculum at Butler University. Second year pre-pharmacy students (sophomores), second year professional students (seniors), and graduating fourth year professional students received the survey. The survey was anonymous, voluntary and completed online. Requests for participation were sent via an email link with a cover letter. Using a Likert scale, students were given four options for response (Strongly Agree, Agree, Disagree, Strongly Disagree). Questions were divided into three areas with respect to students’ perceptions of support and respect for their faith. The areas are within the university, within the College of Pharmacy and Health Sciences, and personal reflection and future career decisions. Results: Response rates varied from 46% (sophomores and seniors) to 66% (graduating fourth year professional students). Additional results are to be analyzed to evaluate the statistical significance and reliability of survey questions to help academicians understand what, if any, importance faith and spirituality bear in the life of the pharmacy student. Demographic information collected may be used to show whether or not differing feelings about faith exist among classes or between genders.

Standardizing Assessment of Student Performance During Advanced Pharmacy Practice Experiences (APPEs). Rhonda M. Jones, Creighton University; Maryann Z. Skrabal, Creighton University; Sam C. Augustine, Creighton University; Gary N. Elsasser, Creighton University; Mark A Malesker, Creighton University. Objectives: The Accreditation Council on Pharmacy Education (ACPE) requires that experiential education programs establish procedures to document and assess student performance of desired outcomes during advanced pharmacy practice experiences (APPEs). These experiential student assessment procedures need to be consistent and standardized for all APPEs and preceptors. After attending the 2006 AACP Institute, the pharmacy Experiential Education Ad-Hoc Committee developed an assessment rubric for experiential student performance. This report describes the process used by the committee to develop standardized assessment criteria based on the pharmacy program’s ability based outcomes (ABOs). Methods: Faculty preceptors were trained in appropriate rubric structure and development during a pharmacy practice department retreat. Faculty groups then developed expectations for student performance of the ABOs during APPEs for each rubric level. The Ad-Hoc Committee then refined and formatted the faculty developed performance expectations. The finalized assessment rubric will be presented to the faculty for approval and, if approved, will be implemented in June 2007 for all APPEs. Results: Specific student performance expectations, assessment procedures and forms that were developed will be presented. Descriptive information regarding how this standardized assessment form will be used for APPEs will also be presented. Implications: Data presented will 1) provide a structured, standardized assessment process for all preceptors who routinely take pharmacy students from Creighton University 2) potentially enhance the quality of experiential education within our program and 3) assist other pharmacy schools/colleges in developing standardized experiential assessment tools and processes.

Student Perceptions of Advanced Practice Experience Selection Processes: Computer versus Manual Systems. Susan H. Staggs, The University of Iowa, Jay D. Currie, The University of Iowa; Sandra J. Johnson, The University of Iowa; Karen B. Farris, The University of Iowa; Gary Milavetz, The University of Iowa. Objectives: As professional experience in pharmacy education expands, the need for and use of computer-based systems for rotation selection and management has increased. The University of Iowa recently changed methods of advanced pharmacy practice experiences (APPE) selection from a manual, class-cohort, student-controlled lottery process to a computer-based process. This paper will: 1) describe two methods of rotation selection for APPE, and 2) compare student satisfaction...
for each selection method. Methods: A non-equivalent control group design will be used. Subjects include final year student pharmacists using the manual selection process in 2003, 2004, and 2006 and student pharmacists using the computer-based process in 2007. A detailed description of each method for selection of APPE will be presented. To compare student’s perceptions of the systems, we used a four-item survey to assess student satisfaction with the APPE selection processes. The survey includes process satisfaction, flexibility, fairness and recommendation to continue using current system for APPE selection. Each question used a six-item Likert scale ranging from “agree strongly” to “disagree strongly.” We will use t-tests to compare student satisfaction on the four items for students using the manual system versus the computer system. Results: Comparative data will be presented regarding student satisfaction with APPE selection processes. Implications: Findings will serve as a benchmark for our professional experience program to assess the use of the computer-based selection method. Identified disparities will be addressed to alter professional experience program policies and methods used in the rotation selection process.

Student Perceptions of Pharmacist-Comducted Patient Assessment. Jennifer J. Lee, The University of Connecticut; Marie A. Smith, The University of Connecticut. Objective: To compare student perceptions of pharmacist-conducted patient assessment before and after completion of an Introduction to Clinical Practice course. Methods: Conveying the relevance of patient assessment in pharmacy practice has been challenging in the pharmacy curriculum. In 2007, the Introduction to Clinical Practice course was redesigned to emphasize total patient assessment. The course, taught by pharmacists and nurses, included examples of pharmacy involvement with patient assessment in the areas of community, hospital, and ambulatory care. For the patient assessment sequence, students had a weekly didactic lecture and lab. Lectures introduced principles of assessing different organ systems, pediatric patients, and geriatric patients. Lab sessions focused on patient care activities involving monitoring drug therapy, writing SOAP notes, and demonstrating proficiency of patient assessment skills. On Day 1 of the course, students completed a pre-test of their perceptions of pharmacist involvement in patient assessment; they will complete a post-test at the end of the course. In addition, information was collected on students’ pharmacy work experience and intended career goals. Results: Pre- and post-tests will be reviewed to determine changes in student perceptions of pharmacist involvement in patient assessment after course completion. Implications: Pharmacists are trusted and highly accessible professionals. With their knowledge of disease and medications, pharmacists are in the position to assist healthcare providers with better management and monitoring of disease and medication use. Pharmacists will be able to determine conditions appropriate for self-care versus physician referral. Ultimately, routine patient assessment performed by pharmacists can lead to better patient outcomes.

Student Perceptions of the Effectiveness of Self-directed vs. Preceptor-directed Early Practice Experiences. Catrina Schwartz, Washington State University; Brenda S. Bray, Washington State University; Colleen M. Terriff, Washington State University/Deaconess Medical Center; Lisa J. Woodard, Washington State University; Douglas Weeks, Inland Northwest Health Services. Objective: American Council on Pharmaceutical Education (ACPE) guidelines require increasing early practice experience (EPE) hours. The goal of this research was to evaluate student perceptions of the effectiveness of self- and preceptor-directed EPE. Methods: During the third professional year, one EPE activity is provided via a precepted direct patient care experience and a second EPE experience is provided via a self-directed medical record review. For the academic years 2005-06 and 2006-07, the third year class was divided into two groups. Fall semester, one group completed the on-site patient care experience and the second group completed a self-directed medical record review. Spring semester, students switched groups. Students completed surveys before either experience and at the end of each experience to gain insight into their perceptions of the value of each experience, including strengths and weaknesses of the activities, and perceptions of their confidence in making patient specific recommendations. Results: Initial results for the 2005-06 academic year indicate: 1) Completion of both EPE activities improved student pharmacists’ perceptions of their confidence to make patient specific recommendations. 2) Preceptor-directed EPE was viewed as extremely beneficial by student pharmacists while self-directed EPE was viewed less favorably. 3) 50% of student pharmacists indicated that the sequence of the activities was an important consideration. Implications: This work in progress will determine how student pharmacists perceive self-directed as compared to preceptor-directed EPE. Results will assist with decisions on placement of EPE activities in our curriculum.
Maria D. Kostka-Rokosz, \textit{Devices. \textit{Survey of Pharmacy Preceptors’ Use of Handheld Electronic Devices.}}

Implications: Utilizing currently available technology can enhance student learning and increase student satisfaction with learning experience. Examining student attitudes and utilization of MP3 lecture recordings is an important step in determining whether continuation of this practice is warranted. Assessment of the impact of utilization of this technology on educational outcomes is planned in the future.

Students’ Perceptions of Preparedness for Oral Examinations. Lisa A. Lundquist, \textit{Mercer University}; Justine S. Gortney, \textit{Mercer University}. Objective: To determine second year pharmacy (P2) students’ perceptions of preparedness for cumulative, midpoint oral examinations. Design: A case-based oral examination will be given to all P2 students enrolled in a cardiovascular-renal III therapeutics course to assess knowledge and to reinforce and evaluate students’ oral communication skills. Following their oral examination, survey completion via WebCT will be requested by the administering faculty members. As WebCT requires a student login and link to name, informed consent will be acquired. Using a Likert scale, students will evaluate the following: their perception of preparedness pre- and post-exam based on utilized study techniques, how their perception of preparedness was similar or different from traditional written examinations, and if their experience from introductory pharmacy practice experiences impacted their performance. Data will be analyzed using the Wilcoxon rank sum test. Students’ perceptions of preparedness will then be compared to their performance on the examination. Results: Late spring semester, oral examinations will be administered and formal assessment of student perception will be completed. Responses from the survey will be collated; results and comparison with examination performance will be presented. Implications: The case-based oral examination represents an additional tool that may contribute to the development of a student’s connection between knowledge, effective communication, and pharmacy practice.

Survey of Pharmacy Preceptors’ Use of Handheld Electronic Devices. Maria D. Kostka-Rokosz, \textit{Massachusetts College of Pharmacy and Health Sciences – Boston}; William W. McCloskey, \textit{Massachusetts College of Pharmacy and Health Sciences – Boston}. Background: As coordinators of the Drug Literature Evaluation (DLE) course at the Massachusetts College of Pharmacy and Health Sciences - Boston (MCPHS-B), we believe it is important that Pharm.D. students are instructed on the appropriate application of handheld electronic devices given their increased utility in current pharmacy practice. Objectives: To determine how to best incorporate training on handheld electronic devices in the MCPHS-B curriculum, we surveyed all pharmacists who currently serve as preceptors for experiential rotations to see if they (1) use such devices, (2) what devices they use, (3) what they use them for, (4) what drug information software they use, and (5) whether they feel it is important for students to be trained on them. Methods: We initially piloted the survey to 10 MCPHS-B Pharmacy Practice faculty representing different practice areas. The questionnaire was modified and finalized based on faculty feedback. The final survey was prepared using eListen software and e-mailed in early January 2007 to 356 preceptors with an accompanying cover letter explaining the project. Preceptors were requested to reply by the end of January. Conclusion: It is expected that this information will provide a foundation for what specific areas students should receive training in, and in addition to DLE, in what courses their use could be applied prior to experiential rotations. It is hoped that this initial phase could lead to a second project which would assess the students’ experiences with handheld devices and whether the specific learning objectives are met.

Teaching Extemporaneous Compounding Skills in the Context of Patient-Centered Care. Tera W. McIntosh, \textit{University of Kentucky}; Patricia R. Freeman, \textit{University of Kentucky}. Objectives: To describe PHR 929 Patient Care Laboratory II and PHR 939 Patient Care Laboratory III, the 2nd and 3rd courses in a six semester course sequence designed to teach pharmacy practice skills within the context of patient-centered care. Methods: In the spring of the 1st professional year and the fall of the 2nd professional year, skills related to extemporaneous compounding are presented to students integrated into the standard patient care process utilized across the lab sequence. Laboratory activities are conducted in pairs throughout the semester. During part 1 of the lab, students perform a patient assessment and identify and characterize a drug therapy problem (DTP) requiring extemporaneous compounding to resolve. Students develop and document a care plan outlining their plans for compounding the product. During part 2 of the lab, students actually compound the product to resolve the DTP previously identified and provide patient education to achieve goals of therapy. Student learning is assessed via standardized patient encounters where students provide patient-centered care in a simulated environment. Technical skills are assessed via a final practical where extemporaneous compounding is required to resolve a DTP identified from the simulated patient assessment. Implications: As the profession continues to move toward patient-centered care as the model of practice, equipping students with the skills and confidence necessary to be agents of this change will be critical. By teaching pharmacy practice skills within the context of patient-centered care, students may come to view all professional activities, including extemporaneous compounding, from a patient-centered focus.

Teaching Self-Care Recommendation and Dispensing Skills in the Context of Patient-Centered Care. Trenika R Mitchell, \textit{University of Kentucky}; Melanie N. Mabins, \textit{University of Kentucky}; Patricia R. Freeman, \textit{University of Kentucky}. Objectives: To describe PHR 919 Patient Care Laboratory I the 1st course in a six semester course sequence designed to teach pharmacy practice skills within the context of patient-centered care. Methods: In the first semester of the 1st professional year, skills related to self-care recommendation and dispensing are presented to students integrated within a standard patient care process. Students present to the lab and role play, one student playing the pharmacist and one student playing the patient; the student pharmacist interviews the student patient and conducts an assessment. Drug therapy problems (DTP) presented in the cases stem from simple, self-limiting conditions treated with self-care recommendations or with single acute care prescriptions. Students identify and characterize the patient’s DTP and recommend an appropriate OTC product, or dispense an appropriate prescription medication to resolve the identified DTP. Students develop and document a care plan, defining goals of therapy and a plan for patient follow-up and provide patient education to achieve goals of therapy. Student learning is assessed via standardized patient encounters where students...
The Impact of School and Site Characteristics on Preceptors’ Perceptions of Experiential Loads, Quality and Time Issues, and Compensation. Maryann Z. Skraba, Creighton University; Rhonda M. Jones, Creighton University; Rondall E. Allen, Xavier University; Mitra Assemi, University of California at San Francisco; Cynthia J. Boyle, University of Maryland; Philip M. Hriteko, The University of Connecticut; Abir (Abby) A. Kahaleh, Lake Erie College of Osteopathic Medicine; Ruth E. Nemire, Nova Southeastern University; Teresa A. O’Sullivan, University of Washington; Denise A. Soltis, Drake University. Objectives: Understanding experiential education loads, quality-time issues, and compensation is necessary as experiential directors are searching for additional quality sites to meet the increased experiential curricular requirements as well as increased student enrollment from new and current pharmacy schools. The purpose of this study was to determine if there are differences in preceptor perceptions of experiential loads, quality-time issues, and compensation when comparing school and site characteristics. Methods: A cross-sectional survey design was used that consisted of both Likert-scale and quantitative questions. The experiential offices of four private and five public schools of pharmacy across the country administered the survey to their preceptors in various pharmacy practice settings across both urban and rural areas of the United States. The questionnaire consisted of 41 Likert-scale and quantitative questions and assessed the following: experiential student loads, quality-time issues regarding experiential teaching, and compensation. Results: The questionnaire was sent to 4,396 preceptors across the country. Descriptive and bivariate statistical analysis according to population density where the site is located and whether the site precepted students from a public or private school/college of pharmacy will be presented. Future survey and sampling refinement along with programmatic research of experiential learning will also be presented. Implications: The results of this comparative assessment will assist experiential directors in understanding preceptors’ perceptions of the experiential environment in which they work.

The Pharmacy Health Fair: A Collaborative Active-Learning Pedagogy. Devra Dang, The University of Connecticut; Lauren S. Schlesselman, The University of Connecticut. Objective: An area of emphasis in the recently-revised ACPE guidelines is communication skills. An active-learning pedagogy was implemented across two courses in order to teach communication skills to pharmacy students. Methods: Pharmacy students in the third professional year taking the Nonprescription Medication and Pharmacy Practice Lab courses are divided into small groups and allowed to choose a therapeutic topic with relevance to both courses. Each group is required to teach the topic to their peers by presenting the information, in the form of a patient education brochure and patient education display board (both at an eight-grade reading level), at a school-wide “Pharmacy Health Fair”. Students from the first through third professional years are required to attend the fair and actively participate by answering questions from each group. The groups also must demonstrate knowledge of their topic to faculty evaluators. All student activities and evaluations are done collaboratively across both courses. Assessments include the accuracy, completeness, and professionalism of the presented information, the effectiveness of the conveyed information to the different intended audiences, and students’ peer evaluation of each member’s contribution. Students’ feedback of the pedagogy is assessed by an anonymous survey at project completion. Results: The results of the student survey as well as faculty course coordinators’ reflections will be reviewed to determine the pedagogy’s effectiveness. Implications: Providing effective pharmacist care requires the ability to adapt the content of conveyed information to a diverse audience. This pedagogy incorporates an innovative active-learning strategy that teaches this skill to pharmacy students.

ACPE Standards 2007 and Curricular Revisions: Factors to Consider. Susan P. Bruce, Albany College of Pharmacy; Audrey Schwartz, Albany College of Pharmacy, Angela C. Dominelli, Albany College of Pharmacy. Objectives: The Curriculum Committee is in the process of reviewing the curriculum and ACPE Standards to determine the best method for approaching necessary curricular changes. To inform that process, the Committee surveyed other colleges of pharmacy to determine how they approached curricular revision, factors influencing revision decisions, and how they are ensuring compliance with ACPE Standards. Methods: An e-mail was sent to 47 Curriculum Committee Chairs at other colleges of pharmacy. Recipients were asked to complete an on-line 13 question survey. Responses were voluntary and anonymous. Results: The response rate was 34% (n = 16). Respondents indicate the last major revision to their curriculum took place 5 or more years ago (44%) and the change was prompted by accreditation requirements (50%). Also, 62.5% will modify their existing curricula, 12.5% will develop a new curriculum, 12.5% will leave the curriculum alone, and 12.5% are unsure of the extent of changes. The faculty-led Curriculum Committee is responsible for curricular revision (94%). Barriers to curricular change include faculty workload (50%), lack of faculty acceptance of proposals for change (37.5%), and vacancies in key development or decision making positions (19%). Implications: Recently revised ACPE curriculum standards are a driving force leading many schools of pharmacy to re-evaluate their curriculum for the first time in a number of years. Former proactive curricular revisions have served schools well as they now consider the ACPE Standards. Support for faculty in terms of standards review and workload considerations should be considered during this process.

Use of a Rubric and Formative Feedback in the Evaluation of Experiential Education Portfolios. Janet Astle, Duquesne University; Elizabeth A. Coast-Senior, Duquesne University. Objectives: The purpose of the development of a rubric and formative feedback assessment instrument as applied to the experiential portfolio is to provide the student with constructive feedback regarding work performed at advanced practice experiences. Meaningful feedback can subsequently be applied by the student in future rotation settings leading to enhanced performance. Methods: A rubric based on the elements required as part of the advanced practice experiences was developed with input from the clinical faculty. Assessment of student mastery was identified as “Satisfactory,” “Recommendations for Improvement,” and “Unsatisfactory.” This rubric was applied to portfolio work submitted by fourth professional year pharmacy students enrolled at Duquesne University for 2006-2007. Students were provided a “Formative Feedback Assessment” instrument with rankings. A “Satisfactory” rating was assigned to work meeting or exceeding the defined expectations. Students receiving “Recommendations for Improvement” were expected to incorporate such
recommendations in future rotation submissions. “Unsatisfactory” work required resubmission. Students were tracked longitudinally throughout the academic year to ensure that recommendations for improvement were incorporated in subsequent materials. **Outcomes:** Student portfolio work product submissions from subsequent advanced practice experiences consistently demonstrated incorporation of prior recommendations for improvement. Review of portfolios was labor-intensive for experiential education faculty but might be remedied by assistance from residents/preceptors. **Implications:** Use of a rubric and feedback assessment may lead to enhanced quality of student performance at experiential settings. Future research will examine the difference between quality of student experiential work when evaluated with use of a rubric/formative feedback as opposed to without.

**Use of an Audience Response System in a College of Pharmacy Curriculum.** Janet P. Engle, University of Illinois at Chicago; R. Francis Schlemmer, University of Illinois at Chicago. **Objectives:** The College recently purchased an audience response system (ARS) to facilitate active learning in the classroom. The system consists of 50 audience response pads and software that is compatible with PowerpointR. **Methods:** Faculty across the curriculum have used the ARS in a variety of settings including large class lectures, recitations and smaller elective classes. Pedagogy such as questions, cases and games have been used successfully to teach a variety of subject matter and facilitate exam review sessions. **Results:** A trend exists towards an increased use of technology in the classroom including the ARS for teaching purposes. Even though we have logistical issues such as not having enough response units for an entire class or providing functionality of the system in all classrooms, the ARS has still proved to be a useful pedagogical tool. Sample uses of the ARS will be highlighted on the poster including use of the system for class participation in case study problem-solving, generating class discussion using opinion polls, exam review, pre-test and post-test and assessment of student learning. **Implications:** Student evaluations have indicated that the students enjoy using this technology in class and many feel it enhances their learning. Faculty report a high degree of satisfaction with the system as it allows the faculty member to have a good sense of student learning especially in the large classroom environment. Current plans include expanding the program and possibly upgrading to a more user-friendly product.

**Using a Health Education Project to Link Didactic and Introductory Pharmacy Practice Experience (IPPE) Learning.** Janelle L. Krueger, University of Wyoming; Jennifer L. Petrie, University of Wyoming. **Background/Objectives:** In addition to practicing skills, experiential coursework should provide students the opportunity to make connections between didactic learning and practice. Since pharmacists are often asked to develop educational materials for a specific patient or group of patients, the purpose of this project was twofold: 1) to help students recognize the role that pharmacists can have in promoting health and 2) to apply and reinforce recently acquired didactic drug information and written communication skills. **Methods:** As part of the introductory pharmacy practice experience (IPPE) sequence, all second year students experience pharmacy practice in four settings. One rotation is a primary care experience at the Downtown Clinic (DTC), a local free clinic. Following the rotation, students work in small groups to create a patient education handout for the DTC applicable to their patient population. Student teams present their handouts and process for creating them to the class and DTC pharmacist. To help develop peer evaluation skills, each handout and presentation is evaluated by two peer teams. Assessment of student perceptions and extent that didactic training was reinforced is ongoing. **Results:** Analysis of project impact and perception data is pending. Preliminary results indicate students value time at the site, but may undervalue the associated project. Peer evaluations provided good feedback and generally agree with the instructor’s evaluation. **Implications:** Explicitly linking experiential activities with didactic coursework maximizes student learning. Experiential projects can also be utilized as a way to give back to community partners and rotation sites involved with student training.

**Welcome to the Real World: Development of a Multi-Station Hands-On Geriatric Dispensing Laboratory.** Kimberly J. Begley, Creighton University; Ann M. Ryan-Haddad, Creighton University; Kelli L. Coover, Creighton University; W. Elaine Lust, Creighton University; Sam C. Augustine, Creighton University; Karen K. O’Brien, Creighton University. **Objective:** To evaluate students’ qualitative feedback from their experiences in a 3 hour geriatric dispensing laboratory. **Methods:** Third year pharmacy students were provided a 2 hour lecture component prior to their 3 hour dispensing lab component. The geriatric lab was revised to incorporate 10-station hands-on pharmacy experiences related to geriatric pharmacy care. Each student was allowed 6 minutes per station. Some stations included identification of drug classes, contraindications, side effects, drug interactions and inappropriate medications. Other stations involved patient counseling and recommending therapeutic changes, and appropriate dosing based on age or renal function. Also included was a videotaped counseling session with an older adult volunteer. A final portion of the lab involved a case review with interactive discussion. **Results:** Qualitative data regarding students’ learning and effectiveness of these teaching methods is currently being collected. **Implications:** Data obtained from student feedback will allow the instructors to determine what changes may be needed to further enhance the lab experience.

**What are Pharmacotherapy Students’ Attitudes About Chronic Pain? Using a Questionnaire to enhance Teaching Insights.** Maureen E. Knell, University of Missouri - Kansas City; Steve Stricker, University of North Carolina Hospitals; Rafia S. Rasu, University of Missouri - Kansas City. **Objective:** To identify students’ attitudes about chronic pain to enhance teaching. **Methods:** An 81-item questionnaire was developed to assess students’ attitudes about chronic pain. Students enrolled in a Pharmacotherapy course completed the questionnaire the week prior to (pre-class questionnaire) and after (post-class questionnaire) classes covering chronic pain conditions. **Results:** Fifty-seven pre-class questionnaires were returned. Respondents’ mean age was 25 years (SD ± 3.5) and 73% were female. Participants averaged 5 years of pharmacy work experience. Ninety-three percent believed chronic pain was a legitimate diagnosis. Participants indicated varying opinions relating to patient reliability of reporting chronic pain, likely reflecting uncertainty about the condition. In one question 52% (SD ± 24) believed chronic pain patients were reliable in reporting pain experienced. However, responses on separate questions indicated patients over-report or under-report pain 49% (SD ± 22) and 33% (SD ± 18) respectively. Forty-seven percent rated themselves as moderate or somewhat more liberal in comparison with peers concerning comfort with patient use of analgesic medications. When asked about current use of analgesics for chronic pain in the United States students’ opinions also varied, with 36% describing patients as over-medicating, 20.3% as adequate and 37.3% as under-medicating. Based on these responses, more focus on appropriate opioid use, abuse, and
dissertation was included in class content. Implications: Faculty may often assume students hold particularly beliefs. However, the use of a questionnaire can provide valuable baseline data for planning class content. Post-class data will be evaluated later to assess impact of teaching strategies employed.

SOCIAL AND ADMINISTRATIVE SCIENCES
Completed Research

A Pilot Study: Evaluating Student Experiential Learning in the Ambulatory Care Setting. Nelson L. Er, The University of Oklahoma; Nancy A. Letassy, The University of Oklahoma. Objectives: To evaluate the effectiveness of 1) rotation activities in developing student medication history taking skills and communication with patients and 2) student working relationship with faculty preceptors. Methods: This study utilized a systematic evaluation plan, which began with identification of stakeholders, the evaluation type, and approach, development of evaluation questions, criteria, standards, and assessment measures, identification of rotation activities, data collection, and analysis and concluded with delivery of evaluation results. Due to limited student intake in this clinic per rotation month, all four fourth-year pharmacy students participated in the study. Students and preceptors were observed in the clinic by the internal evaluator. Individual student and preceptor interviews coupled with student focus group were conducted. Students were asked to self-assess their medication history taking skills and share their learning experiences. They were assured that the evaluation findings would not be released until they had completed this rotation. A naturalistic inquiry was used to augment the descriptive statistics of the student performance. Future research includes other learning activities in this rotation and extends the one month study to recruit more participants. Results: The overall evaluation finding was positive. Students enjoyed interacting with patients and working closely with preceptors. Most importantly, all participants showed skills improvement. They also shared their concerns and recommendations. Implications: The consequence of evaluation includes quality improvement. Quality experiential learning through effective rotation activities prepare students to deliver quality patient care. However, a solid working relationship between student and preceptor is a prerequisite for executing these activities effectively.

An Elective Course in Personal Finance for Healthcare Professionals. Michelle A. Chui, Midwestern University - Glendale. Objectives: To provide 2nd year pharmacy students with an understanding of the principles and applications of personal finance including budgeting, purchasing a house, filing your taxes, consolidating loans, evaluating banking, investing, debt reduction, and insurance options. Methods: At the request of graduating students, a 1.5-credit hour course entitled Personal Finance for the Health Care Professional was developed and offered to 2nd year students. The course was taught through a variety of methods including lecture style, guest speakers, and group activities. Individualized weekly assignments consistent with self-described financial goals were used to evaluate student learning and application of class material. Results: Student course ratings on the format and the relevance of course material to professional practice has scored highly (average of 4.6 out of 5). Knowledge acquisition was shown to be statistically significant using the JumpStart Financial Literacy survey. The number of students who have enrolled in this elective course has more than doubled in size from 39 students in 2004 to 87 students in 2007. Implications: Pharmacy students transition quickly from having a simple low income financial situation, to one that is lucrative and complex. Students have self-identified a deficit of knowledge in this area and recognize that they are ill-equipped to address the complexity of financial management that occurs upon graduation. This course equips pharmacy students with the knowledge to make smart financial decisions, provides opportunities for them to apply good practices to their own financial situation, and teaches them how to identify legitimate and trustworthy sources of information.

Application of a Validated Instrument to Assess Value of an IPPE Over Three Years. Keith N. Herist, The University of Georgia; Henry H. Cobb, The University of Georgia; Lori J. Duke, The University of Georgia. Intent: To compare student perceptions of an introductory experience program in long term care for three consecutive 1st year pharmacy classes. Process: A 10 question instrument which utilized a 5-point Likert scale (Strongly Disagree to Strongly Agree) was developed by course administrators to assess student perceptions of the experience. Questions were also reviewed by the regional pharmacy service which provides a standard experience for student participants. The instrument had been previously validated through confirmatory factor analysis. The instrument focused on the following objectives: assessing the perceived appropriateness of medication administration, increasing awareness of the consultant pharmacist’s role in long term care, and increasing awareness of various patient types and medication administration complexities. Results: Three consecutive 1st year pharmacy classes completed the instrument. Nine questions had mean values above 4.0 (range 4.06-4.63) for all three classes. The remaining question, dealing with desire to pursue a career in long term care, averaged 2.83 to 3.07. Factor analysis provided 3 Eigenvalues above 1.0. The rotational factor analysis varimax method revealed the orthogonal transformation matrix for the three factors. Factor number 1 grouped questions 7, 8, 9 and 10. Factor 2 grouped questions 3, 5, and 6. Factor 3 grouped questions 2 and 4. Standardized Cronbach coefficient alpha for the 10 questions was 0.86. Implications: The value of the introductory practice experience in long term care was evident from the high mean values for the questions among all three classes. The instrument indicated that students had a positive introductory practice experience.

Assessing Knowledge Gain Using Number-Right and Negative-Marking Conditions in a Literature Evaluation Methods Course. Michael J. Miller, Drake University; Ellen M. Coughlin, Drake University; Reanna D. Yenger, Drake University. Study Objective: Number-right scoring may promote guessing whereas negative-marking (i.e., penalizing for incorrect answers) may discourage guessing, and, in turn, improve reliability of measurement. Therefore, this study compared the descriptive statistics, psychometric properties, and effect sizes from a pre/post-course knowledge test administered under number-right and negative-marking conditions. Methods: Responses to a published 20-item pre/post-course knowledge assessment from three historical student cohorts of a course taught by the same instructor were collected. Assessments were not included in course grades. Cohort one (C1) served as a baseline control and was administered only the pre-course assessment under number-right scoring conditions. Cohort two (C2) was administered the pre/post-course assessment under number-right scoring conditions and cohort three (C3) was administered the pre/post-course assessment under negative-marking conditions. Measures of central tendency, reliability [Kuder-Richardson 20 (KR20)], and standard effect sizes (Cohen’s d) for paired scores were calculated and reported. Results: Pre-course mean (±SD) scores for C1 and C2 were (6.71 ± 2.17, n = 126) and (7.75 ± 2.18, n = 126), respectively. Associated reliabilities were low (KR20 = 0.20 and KR20 = 0.18). For C2, the mean post-course
score and reliability increased to (11.68 ± 2.71, n = 123) and (KR20 = 0.54). Under negative-marking conditions, mean pre-course score for C3 was (3.31 ± 2.50, n = 134) and increased to (9.77 ± 3.09, n = 122) post-course. For C3, reliabilities at pre/post-course were improved and comparable (KR20 = 0.55, KR20 = 0.54). Effect sizes for knowledge gain for C2 and C3 were large (d = 1.6 and d = 2.3) and higher under negative-marking conditions. Implications: Number-right scoring may underestimate knowledge gain. The use of negative-marking may improve measurement reliability and more accurately reflect knowledge gain by reducing guessing.

Assessment of Student Attitudinal and Cognitive Gains Resulting from a Course on School Medication Management. Thomas J. Reutzel, Midwestern University – Chicago; Rohin N. Kasudia, Midwestern University – Chicago; Seema J. Shah, Midwestern University – Chicago. Objective: To assess the effect of a graduate seminar-type pedagogical approach on pharmacy students' confidence, valuation, and knowledge regarding the subject area of an elective course. Methods: An elective course in medication management in primary and secondary schools was taught to first and second year pharmacy students in 2005 and 2006. Grading was based on reading assignments, class discussions, and a small group brochure topic useful to school nurses, teachers, parents, etc. Brochures were judged by the primary instructor and three other faculty members. On the first and last day of class, a survey instrument was given to students enrolled in the course. Students used a Likert-type scale to score ten dimensions of course material on their level of confidence with the dimension and how important the dimension is. Knowledge levels were assessed via a 20-item true/false test. Results: About 70 students completed both pre and post tests. Paired t-test results showed that these students realized significant gains (p < .05) in confidence for seven of ten dimensions. Students realized significant losses in valuation for all ten dimensions. A significant increase in scores on the cognitive test was found. Implications: These results show that a seminar-type approach to a professional pharmacy elective can result in significant gains in student knowledge and confidence. Losses in valuation are surprising but may be due to confidence gains (i.e., confidence means less perceived importance). Hopefully, a course like this will result in future pharmacists being more involved in this important area of drug therapy.

Changes in Critical Thinking and Self-Directed Learning over an Academic School Year. Robert M. Cisneros, Campbell University. Objectives: The primary purpose of this study was to determine if surrogate measures of pharmacy student critical thinking and self-directed learning changed over the 2005-2006 academic year at the Campbell University School of Pharmacy (CUSOP). Methods: Subjects were consenting pharmacy students at CUSOP. All four professional years were represented. Three instruments were administered at the beginning/end of the study period: the California Critical Thinking Skills Test (CCTST), the California Critical Thinking Disposition Inventory (CCTDI), and the Self-Directed Learning Readiness Scale (SDLRS). Demographic information was also obtained. Results: One hundred thirty-seven students completed the CCTST and CCTDI and 138 students completed the SDLRS portions of the study. No statistically significant changes were found to have occurred in total scores overall and for the four individual subject groups (P1, P2, P3, P4). Mean student scores were above averages reported from comparable college students/young adults who previously completed the instruments. Mean scores also were comparable to scores reported in similar pharmacy education research. Analysis of scale scores revealed significant differences in four categories: Inference (CCTST scale) and Cognitive Maturity, Confidence, and Openmindedness (CCTDI scales). Significant correlations were also found between the three instruments and several achievement measures. Implications: Continued use of the instruments in a longitudinal manner is anticipated to further assess the students and curriculum. Without larger sample sizes, significant changes in scores may be difficult to detect unless moderate to large effect sizes occur which may not be realistic to expect. Similar studies of pharmacists may provide useful comparative data.

Correlation between Depression and College Student Activities. Conrad Dhing, St. John's University; Greg R. Stein, St. John's University; Mackey L. Martha, St. John’s University; Somnath Pal, St. John’s University. Objective: Evaluate the correlation between depression and college student activities. Method: A cross-sectional study of six universities in New York City and Long Island was conducted in the Fall semester 2006. Full-time undergraduate students from St. John’s University, Stony Brook (SUNY), Fordham University, Lehman College (CUNY), John Jay College (CUNY), and Hunter College (CUNY) were asked to complete a survey, which included the Beck Depression Inventory (BDI), questions on student activities and demographic information. Results: A convenience sample of 381 students completed the survey. Majority of the respondents were college seniors (35.4%), female (59.7%) and resided off-campus (60.8%) with either a family member or room mate (82.4%). The mean age of the respondents was 23.0 years (SD = 5.7 years) with an average of 2.8 years (SD = 1.1 years) spent in college. Of the 379 respondents who completed the BDI section, 20.3% self-reported having experienced episodes of depression while 35.0% could be considered as depressed based on their BDI scores. There were no correlation between the respondents’ BDI scores and activities like number of hours spent working, exercising, socializing, studying, missing classes, number of extra-curricular activities and alcohol consumption. Conclusion: A thorough understanding of the effects of depression on college students’ performance and success is very important to college administrators as well as to the students and their families.

Designing Effective Websites: Innovation in Project-based Collaborative Learning. Andreas Karatsolis, Albany College of Pharmacy; Jason Swarts, North Carolina State University. Students of Pharmacy undergo an especially rigorous curriculum for the six years of their Pharm.D. program at the Albany College of Pharmacy. The content requirements are significant and they match the abilities and skills requirements that they are expected to showcase by the end of their instructional time. In most cases, the almost lock-step professional curriculum is expected to address both content and abilities (such as communication skills), whereas elective courses are only meant to either fulfill a liberal arts requirement or complement the professional requirements. However, following ACPE’s recent emphasis on experiential and applied models of education, an innovative science elective on Web Design was developed and offered in the Spring of 2006 at ACP, which provided pharmacy students with essential skills for professional growth. The course offered 4th and 5th year ACP students the opportunity to engage in a pharmacy related real-life web design project (e.g. Medicare Part D website or Global Health perspectives portal), while collaborating with students of technical communication from North Carolina State University. The combination of experiential education and interdisciplinary, collaborative practice produced very successful results for students of both schools, as well as the “clients” of the websites, who were able to benefit from the contributions of content experts (ACP) and tool...
Discrepancy between Patients’ Perception of and Independent Observer’s Observations of Pharmacists’ Question-asking Behavior. Hamid Rahim, Long Island University; Bupendra K. Shah, Long Island University; Betty A. Chewning, University of Wisconsin.

Background: Given the lack of expertise, patients may be confused about what constitutes appropriate question-asking behavior. While much attention has been focused on pharmacist question-asking behavior, little attention has been paid to identifying patient perceptions of pharmacists’ question-asking behavior. As pharmacy practice becomes more patient-centered, the clarity of information exchange between patients and pharmacists is paramount. Objective: To examine the discrepancy between patients’ perception of and independent observer’s observations of pharmacists’ question-asking behavior. Method: Thirty community pharmacies across eight counties in Wisconsin were enrolled for the study. At each pharmacy, 12 patients were enrolled. Each patient’s interaction with the pharmacist was observed. Right after their encounter, patients completed a survey questionnaire containing items related to their interaction. Descriptive statistics were conducted to identify discrepancy. Results: Seventy-five percent of patients reported that pharmacists asked them a question about medications. For the same encounters, the observer reported that more than ninety percent of patients were asked questions by their pharmacists. Eighty-six percent of the discrepancy in patient and observer ratings were related to pharmacists’ use of “do you have any questions” or its variants. Implications: A discrepancy exists between patients’ view of and observers’ report of whether the pharmacist asked a question. Given that patients were surveyed right after their interaction, this disconnect can be attributed to the use of neutral and closed-ended questions such as “do you have any questions”. Pharmacists and pharmacy students need to understand the importance of asking open-ended questions during their practice.

Evaluating Student Perceptions of a Learner-Centered Drug Literature Evaluation Course. Spencer E. Harpe, Virginia Commonwealth University; Lisa Burroughs Phipps, Virginia Commonwealth University. Objective: To evaluate student perceptions of a drug literature evaluation course that utilized learner-centered teaching principles. Methods: The drug literature evaluation course was recently re-designed to implement learner-centered principles discussed in texts by Weimer and Huba and Freed. Only two assignments were required of students: the final examination and a primary literature article evaluation. All other assignments were optional. A questionnaire was developed to assess student perceptions of the course structure and preferences for the learner-centered approach. Responses were measured on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Results: Of the 108 enrolled students, 102 provided usable responses (94.4% response rate). Students reported that they prepared differently for classes and exams (67.7% and 74.5%, respectively). The highest rated items (mean standard deviation) related to student control in determining the overall grade (4.71 (0.59)), less pressure to perform well on every assignment (4.50 (0.90)), and a less stressful learning environment (4.40 (0.96)). Eighty-eight percent of students found that completing the optional assignments reinforced material presented in class. Students found the course policies to be transparent (93.1%) and generally supportive of their learning (78.4%). Approximately 77.5% of the students would prefer the learner-centered drug literature evaluation course over a similar non-learner-centered course; 82.4% said they would rather take other courses utilizing a learner-centered approach. Implications: Learner-centered teaching methods were viewed favorably by students and appeared to have a positive impact on their learning experience. The effects of learner-centered teaching on pharmacy curricula deserve further evaluation.

Expanding the Distribution of Pharmacy Students’ Examination Completion Times and Factors Which Affect Test Performance. Rajul A. Patel, University of the Pacific; Gina Maeda, University of the Pacific; James (Jim) Uchizono, University of the Pacific.

Objectives: To explore the distribution of pharmacy students’ examination completion times. Relationships between exam completion times, perceived anxiety level, student-specific demographics, and student test performance were also investigated. Methods: A standardized timer was used to record the time that participating students took to complete each exam. For each exam, students were asked to rate their level of anxiety using a 5-point Likert scale. Student test performance was measured for each respective exam. All relevant information was collected for both midterm and final examinations. Results: The cumulative probability distribution of pharmacy students’ examination completion times took on two of two appearances: a) a near-sigmoidal shape or b) an exponential form. The present study revealed that greater than 50% of students took at least 80% of the allotted time for each exam administration period. The study also found that students with higher levels of self-reported anxiety took longer to complete, and performed more poorly on, exams. Discussion: Future work may be directed at exploring: 1) whether heightened self-reported anxiety is the harbinger for longer test-taking times and impacts students from performing well on examinations and/or 2) whether higher levels of self-reported anxiety arise because students are inadequately prepared for examinations, therefore providing an explanation for why such students take longer to complete exams and perform more poorly. It is our belief that understanding the environment surrounding student examinations will help ensure that educators and students alike have aligned expectations and better enable students to succeed.

Impact of Service-Learning on Perceptions of the Elderly, Disease State Exposure, and Drug Knowledge. Simran Sidhu, The University of Texas at Austin; Arlyn Kloesel, The University of Texas at Austin. Service-learning has been shown to enhance community involvement, leadership, and communication skills among pharmacy students. First-year pharmacy students (n = 108), who were enrolled in a 9-month geriatric service-learning program, were surveyed pre and post to determine if there were significant differences in: (i) perceptions about the elderly; (ii) disease state exposure; (iii) drug knowledge, and (iv) which demographic and exposure factors were related to change in drug knowledge. Perceptions were measured using Palmore’s Facts on Aging survey, disease state (22 diseases) exposure was measured using a 5-point scale (1 = no exposure to 5 = extreme exposure) and drug knowledge (15 drugs) was assessed by familiarity with drug name (1-point) and indication (1-point) (score range 0-30). Data were analyzed using paired t-tests and regression analyses. Although there were no significant differences from pre- to post-test, student perceptions regarding the elderly remained positive throughout the program. Disease state exposure (across all diseases) increased (p < 0.0001) from 1.9 ± 0.5 to 2.5 ± 0.6, with the largest increase (1.2-1.7 point increase) observed with dementia, Alzheimer’s, osteoporosis, hypertension, Parkinson’s, and congestive heart failure. Drug knowledge scores increased (p < 0.0001) from 15.0 ± 6.5 to 25.0 ± 3.5. Results
of regression analysis showed that younger students and students with fewer total hours of pharmacy practice experience showed the greatest improvement in drug knowledge ($R^2 = 0.43$ and $p < 0.0001$). In conclusion, service-learning helped students maintain a positive attitude toward the elderly, enhanced exposure to disease states, increased drug knowledge and helped establish a homogenous level of drug knowledge among first year pharmacy students.

**Impact of Direct-to-Consumer-Advertising (DTCA) on Consumer Behavior for Seasonal Allergy Medications.** Nile M. Khanfar, Nova Southeastern University; Kevin A. Clauson, Nova Southeastern University. **Objectives:** The objective of the study is to explore the relationship between DTCA for prescription medication for seasonal allergy and the resulting impact on consumer behavior. **Methods:** This study was based on a one-group, after-only procedure. A purposive sample of US residents with email addresses was obtained. The survey instrument consisted of 68 items assessing medication use for seasonal allergy as well as capturing data about: 1) television advertisements viewed, 2) if the physician was asked about the drug featured in the advertisement, and 3) whether a subsequent visit resulted in a change of medication. Inferential tests, frequency counts, percentages, and descriptive analyses were used to analyze the data. The key tests included crosstab analysis and binomial tests with the Z approximation. **Results:** Of the 478 respondents, 91.6% had seen a television advertisement for, and 30.5% took, a prescription medication for seasonal allergy. Of those who indicated the brand they used, Allegra (32.2%), Zyrtec (29.4%), Clarinex (18.5%) were listed. The percentage of respondents who reported discussing the brand of medication they saw on television was 12.9%. Of that group, 46.8% confirmed it resulted in a change of medication. **Implications:** The findings illustrate potential impact of DTCA on consumer behavior regarding allergy medications. Consequently, there is a need for pharmacists to be qualified to counter-detail to offset DTCA. The next phase of this project will be to assess the prevalence of counter-detailing instruction, especially aimed at the effects of DTCA, in colleges of pharmacy in the US.

**Implementation of Personal Digital Assistants (PDAs) in Healthcare: A Pharmacist’s Perspective.** Anandaarop Dasgupta, University of Houston; Samir Sikri, University of Houston; Sujit S. Sansgiry, University of Houston. **Objective:** The objective of this study was to measure the use of Personal Digital Assistants (PDAs) by pharmacists and assess their interest in using PDAs for various activities. **Methods:** A cross-sectional study was conducted by administering a prevalidated survey to a convenient sample of pharmacists ($N = 295$) in the Houston metropolitan. A scale from 0 (never) to 5 (frequently) was used to measure how often pharmacists used PDA for clinical administration (10 items), practice administration (9 items) and knowledge enrichment (4 items) if they owned a PDA. Similarly, a five-point extremely disinterested (1) – extremely interested (5) scale was used to measure interest in future PDA use for those who did not own or use PDA. Descriptive analysis and comparative analysis were performed to understand the activities for which PDAs were used. **Results:** Among the surveyed population 49% of pharmacists owned PDA. The top 5 activities in which pharmacists used PDAs were personal organizer (3.72 SD 1.80), drug information (2.94 SD 1.84), medical calculator (2.62 SD 1.91), clinical information to physicians (1.99 SD 1.90) and read medical textbooks (1.59 SD 1.86). These results were similar when analyzed to evaluate interest with respect to those who did not own or use a PDA for the above five activities. **Implications:** Pharmacists who own a PDA, use it mainly for the basic functions that help them in their job duties. Training opportunities for pharmacist as well as initiation of PDA use in the pharmacy curriculum may enhance the use and benefits derived from PDAs.

**Implementation of a Health Education and Promotion Elective Course for Pharmacy Students via Distance Education.** Brenda Soto-Torres, Nova Southeastern University; Blanca I. Ortiz, Nova Southeastern University. **Objective:** A 2-credit elective course on health education and promotion was developed for second and third year pharmacy students. The objective of this course was to provide key elements necessary to develop competencies geared to the planning, evaluation, and provision of health education and promotion programs and their incorporation into pharmacy practice. **Methods:** The course was pilot-tested during Winter 2006 and broadcasted live to distance sites during Fall 2006. Teaching techniques included live lectures, WebCT, supplemental material, and group presentations. Students were involved in multiple steps of program planning including needs assessment and development of objectives, a theory-based program and an evaluation plan. Enrolled students were divided in small groups based on physical location and were required to present the design of their program plans to course faculty and classmates. Evaluation criteria included in-class examinations, written assignments, quizzes and assessment of the oral presentations. Students voluntarily completed a satisfaction questionnaire and on-line faculty and course evaluations at the end of the semester. **Results:** A total of 21 students enrolled in the course. Covered topics included needs assessment, planning, budgeting and pharmacists’ role, among others. After completing this course, students expressed being prepared to develop health education and promotion strategies by learning to prioritize needs among different health issues. **Implications:** There is a need for future pharmacists to develop skills necessary to engage in health education and promotion activities. Involvement in public health activities can be encouraged by the implementation of health education and promotion courses into the pharmacy curriculum.

**Medicare Part D and Pharmacy Students: Preparing Future Pharmacists for Medicare Part D Challenges.** Kimberly A. Burns, Lake Erie College of Osteopathic Medicine. **Objectives:** The initial and continuing implementation of the Medicare Part D outpatient prescription drug benefit has greatly impacted the practice of pharmacy. In addition to turning to pharmacists to dispense prescription drugs covered by Part D plans, millions of Medicare beneficiaries also call upon pharmacists for information and guidance in order to make informed decisions in plan selection. A Medicare Part D elective course was offered to help determine appropriate teaching methods to prepare students for these ongoing challenges. **Methods:** Three methods were combined to educate and expose pharmacy students to Medicare Part D. These included: didactic lecturing and guest speakers from the local, state and national level; community outreach events coinciding with Part D open enrollment; and group research projects incorporating a Part D topic. At the completion of the course, students were surveyed on their understanding of Medicare Part D and their perceived value of the community outreach events and research projects. **Results:** Based on student assessment, the various methods used were effective for the students understanding and application of Medicare Part D concepts. Students were able to learn the complexities of Medicare Part D; apply their understanding of Medicare Part D to assist the community; and successfully complete and present a research project involving a Medicare Part D topic. **Implications:** This elective course model will be used to educate and prepare future pharmacy students regarding Medicare Part D, and to
continue providing valuable service to the community and local Medicare beneficiaries.

**Pharmacists’ Drug-Related Information Provision Behaviors and Patient Self-Report of Its Importance.** Bupendra K. Shah, Long Island University; Betty A. Chewning, University of Wisconsin. **Objective:** To identify the extent to which pharmacists provide information on medication use, side effects and interactions orally and to assess the importance patients place on pharmacist provided information. **Methods:** A cross sectional design was used to enroll 30 pharmacists working in community pharmacies across eight counties in Wisconsin. At each pharmacy, 12 patients were enrolled. Overall 360 patients were observed for their interactions with the pharmacy staff. A survey questionnaire containing items on the importance of information on directions, side effects and interactions was completed by each participating patient while exiting the pharmacy. **Results:** In approximately sixty percent of the encounters, pharmacists provided oral information on directions. Only one in four encounters involved pharmacist providing information on side effects. Similarly, only one in four patients received information on interactions. A little more than fifty percent of patients indicated that it is extremely or very important to get information on side effects of the medications. Similarly, almost sixty percent of patients indicated that it was extremely or very important to get information on the interactions of the medications. Less than one-fourth of patients indicated that it was extremely or very important to get information on the directions of use. **Implications:** There is a clear discrepancy between pharmacist information provision behaviors and the importance patients place on the type of information that they receive. Future research needs to examine the impact of this discrepancy on patient expectations and behaviors.

**Pharmacy Faculty Salary by Rank and Discipline: Examination of Salary Progression and Salary Compression over Time.** Matthew M. Murawski, Purdue University; Brenden King, Purdue University. **Purpose:** Turnover and retention of pharmacy faculty is an important issue. Given recent increases in pharmacist salaries, a salient question is the differential in first year faculty salaries and those of established faculty. This study evaluates compensation for first year and experienced faculty, and differences across disciplines and over time. **Methods:** The AACP Salary and Demographic Surveys were reviewed. Salaries of ranks and disciplines were extracted from 1975 to 2005. Reported salaries were then adjusted for inflation and compared using 2005 dollars. **Results:** In several years, first year assistant professors’ mean salary equals or exceeds that of all assistant professors. This appears to occur less frequently in the bench disciplines, but in one instance, first year assistant pharmaceutical chemistry and pharmacognosy professors’ mean salary exceeds that of those disciplines’ associate ranks. The mean salary of first year professors also appears to increase at a greater rate than that of all assistant professors in the same disciplines. The rate of increase appears to vary over time, as well. **Conclusions:** Overall, pharmacy faculty compensation has improved over time. There does seem to be clear evidence for salary compression, however. The rate of increase in new faculty salary has also shown change over time. In light of the continued concern over the recruitment and retention of pharmacy faculty, these preliminary findings suggest the need for a more detailed examination of this data, especially if comprehensive pharmacist salary data can be obtained for the same time period.

**Pharmacy Student Attitudes Toward Types of Mental Illnesses and Provision of Services.** Nathaniel M. Rickles, Northeastern University; Reshmi Singh, Massachusetts College of Pharmacy and Health Sciences – Boston; Michael Montagne, Massachusetts College of Pharmacy and Health Sciences – Boston. **Background:** Studies suggest pharmacy students have favorable attitudes towards mental illness (Crismon et al., 1990; Jermain and Crismon, 1991) and lectures and clinical rotations had no impact on these attitudes (Jermain and Crismon, 1991; Bell et al., 2006). Bell et al. (2006) found no differences between the stigma pharmacy students had for schizophrenia and depression. **Aims:** We explored if pharmacy students had different attitudes towards those schizophrenia and depression, perceived their attitudes towards schizophrenia and depression as being different from others in pharmacy and physicians, were less willing to provide services to those with mental illness than with asthma, and determine factors affecting student willingness to provide services to the mentally ill. **Methods:** Convenience samples of pharmacy students at two urban schools of pharmacy were recruited to complete a written survey. **Results:** 314 students were recruited across both schools. Pharmacy students had significantly less stigma towards those with depression than with schizophrenia (p < 0.001). Students perceived themselves as having significantly less stigma for depression and schizophrenia than others in pharmacy (p < 0.001) but saw no differences between themselves and physicians regarding both mental disorders. Students were significantly more willing to provide services to those with asthma than mental illness (p < 0.001). After controlling for predictors of stigma, students with less stigma for depression and schizophrenia (p < 0.001) and a greater counseling orientation (p < 0.05) were significantly more likely to provide services to those with mental illness. **Conclusion:** Findings clearly highlight the need for developing effective strategies to reduce stigma of mental illness among pharmacy students.

**Progressively Complex Communication Skills Training Exercises Facilitate Learning and Alleviate Student Anxiety About Patient Counseling.** Jan Kavookjian, Auburn University; William A. Villalune, Auburn University; Bruce A. Berger, Auburn University. **Background:** Individual students exhibit different learning styles. Retention of communication concepts, as well as acquisition of effective communication skills, may be impacted by offering varied, progressively demanding levels of learning opportunities. **Objective:** A progressively complex set of Motivational Interviewing (MI) skills development exercises and role playing sessions were developed and evaluated in the communication course for P1 students. **Methods:** The students received didactic delivery of content for MI concepts. They were simultaneously given exercises and skills-practice experiences, which varied in type and assessment. Initial exercises were simple and instructor or group facilitated; they progressed in complexity and responsibility for self-facilitation. These included group-based patient statement analysis, individual-based patient statement analysis, MI script writing assignment, instructor facilitated transition cases, student facilitated transition cases, instructor facilitated MI role playing with feedback, group facilitated MI role playing with feedback, and culminated with an Objective Structured Clinical Exam (OSCE). Graded assignments were analyzed; student responses to MI test items used in the previous year were also compared to the current year. **Results:** Average score on the MI OSCE was 84%. Test items revealed higher scores than for the previous year. Student feedback for the training exercises was positive, particularly regarding the way the progressive nature from simple to complex alleviated their fears about counseling a standardized OSCE patient using MI skills. **Conclusions:** Progression of complexity and student responsibility in skills training may facilitate learning, perhaps by addressing different learning styles, or perhaps by alleviating student anxiety about patient counseling.
Quality Ratings of Social and Administrative Science Journals. Suvapun Bunniran, The University of Mississippi; Erin R. Holmes, The University of Mississippi. David J. McCaffrey III, The University of Mississippi; William Boyd Lobb, The University of Mississippi. **Objective:** To assess and compare the quality of journals for the dissemination of social and administrative science (SAdS) content as rated by pharmacy deans, SAdS department/division chairs, and SAdS faculty. **Methods:** Based on qualitative data received from an earlier investigation, a list of appropriate journals was used in an Internet survey administered to 88 pharmacy school deans, 78 SAdS department/division chairs and 317 SAdS faculty. Names and e-mail addresses were compiled from publicly available sources. Journal quality was rated on a 7-point scale (1 = low quality and 7 = high quality), with the option of indicating unfamiliarity with each journal. Differences in quality ratings among faculty, chairs and deans were assessed. Discounted rating scores were calculated to account for the number of respondents unfamiliar with individual journals. Additionally, current quality ratings were compared to those reported in studies published over the last 20 years. **Results:** Faculty were found to be the most familiar with SAdS journals, while deans were found to be least familiar. Deans, and even chairs in some instances, were the least familiar with SAdS discipline-specific journals. Faculty rated journals concerning social and policy-related issues in medicine as higher in quality than deans. Rankings from the current study were highly correlated with journal ranking from previously published studies. **Implications:** The differences in quality ratings and journal familiarity that were identified have implications for tenure, promotion, and/or other decisions that are based on SAdS scholar’s publication record; especially when decision makers have scholarly and teaching backgrounds in disciplines other than SAdS.

Sentinel Surveys: A Continuous Formative Online Assessment Tool to Evaluate Students’ Educational Experiences. Sean T. Leonard, Nova Southeastern University; Graciela Armayor, Nova Southeastern University; Jolanta M. Czerwinska, Nova Southeastern University; Marcus Droege, Nova Southeastern University. **Objective:** To deploy surveys assessing and reporting pharmacy students’ educational experiences rapidly. **Methods:** Sentinel Surveys are short (five-item) online assessments developed by the College of Pharmacy’s Educational Assessment Committee. Students are randomly selected each week by a date-triggered event through an internet server and invited by email to complete the survey, although students may also participate on their own initiative. An automated computer procedure aggregates and interprets the results each week, and then emails alerts of significant problems (“Sentinel Events”) to program administrators. This allows for the rapid identification and resolution of obstacles to the educational process, as well as highlighting educational experiences that students feel are enhancing their learning. **Results:** A four-week pilot study yielded consistent response rates of ≥60 percent. Near real time student ratings appear to be sensitive and robust indicators of the educational experience, when compared to summative assessments at the end of each term. Qualitative results are helpful in isolating common themes over time and clarifying Sentinel Events. The Sentinel Survey system was found to be especially useful in evaluating issues related to distance learning. **Implications:** Study findings indicate that continuous online Sentinel Surveys are useful in rapidly assessing and reporting student learning experiences. Brief surveys and random sampling minimizes the response burden to students while allowing for educational problems to be identified quickly and corrective actions implemented swiftly. The utility of this assessment approach may have implications beyond the evaluation of learning experiences.

Students’ Perceptions of Mentoring in a Pharmacy Program. Gayatri Gopal, The University of Mississippi; Clive M. Mendonca, The University of Mississippi; Kyle D. Null, The University of Mississippi. **Objectives:** To explore undergraduate students’ perceived need and benefit of mentoring in a professional pharmacy program, and to determine when in the program they desire mentorship. Desired characteristics of the mentoring relationship were also identified. **Methods:** A cross-sectional, self-administered survey was distributed to second, third and fourth year professional students enrolled in The University of Mississippi School of Pharmacy. 85.5% of these students participated in the study. **Results:** Mentor attributes valued by students were experience, supportiveness, communication skills, and integrity. Students reported a preference for female mentors and female students were more likely to report such a preference. Females perceived a greater need for mentoring than males and were more likely to value a mentoring relationship as beneficial. Furthermore, no relationship was found between perceived value of and perceived need of mentoring. No significant relationship was found to exist between students’ cumulative GPA and their need for a mentoring relationship. Students preferred meeting with their mentor individually rather than groups and also preferred selecting their mentor rather than being assigned one. The majority of students preferred developing a mentoring relationship in their third professional year. However, second year professional students preferred developing the relationship during their second professional year. Career and academic development were the most desired outcomes of the mentoring relationship. **Implications:** By recognizing students’ reported need, and desired characteristics of a mentoring relationship, academic administrators can initiate and structure a pharmacy-mentoring program that benefits students’ academic and career development.

Summative Assessment of Student Satisfaction Towards a Health Education and Promotion Course. Brenda Soto-Torres, Nova Southeastern University; Blanca I. Ortiz, Nova Southeastern University. **Objective:** Due to an increased need for pharmacists’ involvement in public health-related activities, a new elective on health education and promotion was developed and offered via distance education. The purpose of this study was to evaluate and assess the level of satisfaction of pharmacy students towards this course. **Methods:** A 19-item questionnaire was administered to students across three campuses located in Davie, FL, West Palm Beach, FL, and Ponce, PR. Data analysis included descriptive statistics and frequency distributions performed using SPSS V. 14.0. **Results:** Demographic characteristics of the surveyed population were distributed as follows: Hispanic (50%), females (80%), single (75%), held bachelor degrees (55%), and main area of professional interest was hospital pharmacy (30%). Among the covered topics, “Pharmacist role in treatment adherence and behavior change” and “Grant writing” were identified as the most and least relevant topics respectively. Higher levels of satisfaction were reported for time management (3.6/4), whereas physical facilities were ranked as the least satisfactory (3.3/4). Eighty percent (80%) of students indicated they would take the course again and 95% would recommend it to other peers. A total of 18 students (90%) reported feeling prepared to design a health education promotion program after taking this course. **Implications:** Pharmacy students can benefit from courses teaching diverse public health skills. Becoming familiar with program planning steps will allow this group of future healthcare professionals to implement these strategies into their practice sites resulting in a positive impact in the public health of their respective communities.

Teaching P1 Students Competency in Motivational Interviewing. William A. Villaume, Auburn University; Bruce A. Berger, Auburn University; Jan Kavookjian, Auburn University. Background: Teaching Motivational Interviewing (MI) to P1 students is challenging. Using didactic methods to teach communication concepts and the principles of MI may not be adequate to help students develop basic competency in using MI to counsel patients. Objective: This paper describes and assesses a skills development process implemented in a redesign of the patient communication course taught to P1 students. Methods: The redesign included an additional five two-hour lab periods to practice patient counseling skills. The skills lab concluded with a final Objective Structured Clinical Exam (OSCE); students were required 1) to counsel a standardized patient about a new prescription, and 2) to use Motivational Interviewing (MI) to counsel a second standardized patient about adherence with a prescribed treatment regimen. The relationships among the six graded components were analyzed to determine how the two OSCE scores related to the two multiple choice exam scores and to the two scores on highly structured patient counseling exercises (a videotaped new prescription counseling session, and an MI scriptwriting assignment). Results: Factor analysis with an orthogonal rotation of 3 factors indicates that: *scores on the multiple choice midterm and final exams are related, *the two OSCE scores and the score for the MI scriptwriting assignment are related, *the scores for the MI scriptwriting assignment and the videotaped counseling session are related. Conclusions: Findings suggest that the multiple choice exam scores are unrelated to the competency scores from the structured exercises and the OSCE exams.

Transforming Student Pharmacist and Nurses’ Tobacco Cessation Education through a Distance Education Course. Alan J. Zillich, Purdue University; Karen S. Hudmon, Purdue University; Anna McDaniel, Indiana University School of Nursing. Objective/ intent: To develop and implement an online tobacco cessation course for pharmacy and nursing students. Methods/process: The semester-long course is taught as a series of asynchronous, online modules hosted through Web CT. Students spend 1-2 hours per week engaged in independent study and online discussions. The learning technology includes: Web-based modules, combined video and graphic streaming, discussion boards, written assignments submitted electronically, online quizzes, and web links to other informational resources. Course lecture slides, which are presented visually with accompanying audio, are adapted from the Rx for Change: Clinician-Assisted Tobacco Cessation program. Students completed online pre- and post-course surveys assessing their skills and ability to counsel patients on tobacco use. Items were scored on a 5-point Likert scale. Five items address the students’ counseling skills (range, 1 = poor to 5 = excellent). Eleven items address students’ self-efficacy to provide tobacco cessation counseling (range, 1 = not at all confident to 5 = extremely confident). Domain scores for skills and self-efficacy were calculated and Wilcoxon signed ranks test compared pre- and post-course responses. Results/outcomes: Pilot offerings for the course were delivered during the Spring and Fall of 2006. Twenty-five students successfully completed the course. There was a significant improvement in students’ skills and self-efficacy to provide tobacco cessation counseling. Mean item scores were 2.4 before and 4.1 after the course (p < 0.001) for skills and 2.3 before and 4.1 after the course (p < 0.001) for self-efficacy. Implications: This course enables the provision of online tobacco cessation education. Pilot results suggest that program exposure improves students’ self-reported ability to counsel patients. Expansion of the course across other disciplines and continued assessment of student outcomes is warranted.

Using Active Learning to Stimulate Interest in a Health Disparities and Cultural Competency Elective. Doneka R. Scott, University of Minnesota. Objective: To provide an overview of health disparities and stimulate interest in a new third-year health disparities/cultural competency elective course which had controversial topics and a low enrollment for the first offering. Methods: Second-year pharmacy students received a 50-minute health disparities lecture in a required course, Pharmacy & the Health Care System, delivered in the Twin Cities and broadcasted via interactive television to Duluth students. Active learning strategies were utilized and included: an anticipatory set, think/share, wrap-up, review and closure; and a study guide framework to provide the scaffolding to master critical content. In a post-survey, students subsequently evaluated: 1) the structured session, 2) the study guide, 3) the preference for lecture slides and 4) if the content encouraged them to advance their knowledge and/or stimulate interest in the elective. Results: The survey response rate was 39% (41/106) for the Twin Cities and 45% (24/53) for Duluth, with an overall response rate of 41%. Ninety percent (90%) of all respondents were satisfied with the structured activity, with half stating that the structure was more than satisfying, very good or exceptional. Sixty-three percent (63%) felt the handout was an effective tool to identify key lecture points; however, 77% would have preferred a copy of the lecture slides as the handout. Sixty-six percent (66%) of respondents agreed that the lecture encouraged students’ further interest in health disparities and/or taking the elective. Implications: A one-hour introductory lecture can effectively utilize active learning strategies and stimulate interest in a new elective.

Theoretical Models

Connecting the Dots in a Health Literacy Course. Monina R. Lahoz, Massachusetts College of Pharmacy & Health Sciences - Worcester. Intent: In the 10-week summer 2006 session, an elective course, “Addressing the Health Literacy Challenge,” was significantly revamped due to an increased class size and loss of two course instructors. It was an opportunity to change the course format, and adopt and adapt alternate instructional and assessment activities, guided by the literature on collaborative and active learning. Process: To better connect students to the assigned textbook topics each week, students evaluated related articles from scientific/professional journals or newspapers, and conducted related in or out of class projects. For example, when the book topic was “Assessing Suitability/Readability of Materials,” an article in the Journal of Women’s Health titled “Evaluation of Web-based Osteoporosis Educational Materials” was also discussed, and students evaluated the suitability/readability of 21 U.S Pharmacist “Patient Teaching Aids” in class. Worksheets were designed for each session not only to guide class activities but also to document and assess student performance. Outcomes: 93% of the 41 students earned a final grade of A or A-, based on 9 literature reviews and 11 class exercises (70%), a field project poster presentation (20%), and attendance (10%). The course format was well-received by the students; mean scores on the 17-item course/instructor evaluation ranged from 4.3 to 5.0 on a 5-point scale. Implications: There are alternatives to traditional lecture and testing methods that allow faculty members to cover content and measure student learning, and provide students opportunities to make better connections between a subject matter and their professional lives. They may, however, require extensive planning.
Work in Progress

A Continuous Improvement Undertaking of an Evidence-Based Medicine (EBM) Pharmacology Course. Monina R. Lahoz, Massachusetts College of Pharmacy & Health Sciences – Worcester; Alice J. Gardner, Massachusetts College of Pharmacy & Health Sciences – Worcester; Irena Bond, Massachusetts College of Pharmacy & Health Sciences – Worcester. Objectives: To determine if changes made to an elective EBM pharmacology course resulted in improvements in teaching and assessing pharmacy students’ knowledge and skills in five domains of the EBM Method (Sackett 2000) - formulate a clinical question, conduct efficient searches, critically appraise the evidence, apply the evidence, and evaluate the EBM process. Methods: As part of an ongoing continuous improvement undertaking, three years of formal and informal evaluations of an EBM pharmacology course were analyzed to develop and implement changes to the spring 2007 offering. The number of clinical pharmacology problems students analyzed was reduced from four to three, freeing up three class sessions for focused hands-on instruction on the EBM method. Worksheets and grading rubrics were created to guide the instruction and to monitor students’ progress throughout the semester. The Fresno test of EBM skills will be administered in Weeks 1 and 14, and the scores of each student and the class in Weeks 1 and 14 will be compared using the t-test. To determine if course changes actually resulted in improvements, the magnitude of change in Fresno scores of the spring 2007 students will be compared to those of previous classes. Results: Nine students took the Fresno test in Week 1 of the spring 2007 semester. They also have completed three weeks of hands-on instruction. Implications: Although improvement cannot happen without change, not all changes result in improvement. When undertaking continuous improvement projects, it is essential to select changes that will most likely bring about course improvement.

A Measure of Professionalism Among the University of Louisiana. Edwin H. Adams, The University of Louisiana at Monroe. Objectives: In recent years several published articles have questioned whether colleges and schools of pharmacy are fostering professional attitudes and behaviors. The purpose of our study is to measure and compare perceptions of professionalism among the first, second, third, and fourth year ULM pharmacy students. Methods: The Pharmacy Professionalism Instrument (PPI), developed by Marie Chisholm and colleagues at the University of Georgia (UGA) College of Pharmaycwm was used. The PPI evaluates six tenets of professionalism in pharmacy: altruism, accountability, duty, honor and integrity, and respect for others. It was distributed to the first, second, third, and fourth year ULM pharmacy students via an online survey. Participants were asked to indicate the extent to which they agreed or disagreed with each of the 18 items using a 5-point Likert scale. Results: A total of 297 students completed the online survey. 99 were first year, 71 were second year, 69 were third year, 55 were fourth year students, two 2006 graduates, and one 2011 graduate. 94 were male and 203 were female. Statistics analysis is pending. Implications: This survey continues the work of UGA College of Pharmacy and uses a unique pharmacy specific survey instrument. Perceptions of professionalism must be held to its highest standard to maintain relationships among the students, faculty, and administration, and to encourage leadership development, which relies on how you foster professional attitudes and behavior. For the Assessment Committee to accurately assess the professional program and for the curriculum committee to make appropriate changes to the curriculum, it is essential to monitor changes in perceptions of professionalism of ULM pharmacy students.

A Survey of Beneficiaries’ Assessment of Outcomes after Medicare Part D Education. Jayashri Sankaranarayanan, University of Nebraska; Aimee McKim, Volunteers Assisting Seniors, Senior Health Insurance Information Program (SHIIP), Omaha, Nebraska. Background: Despite widespread education of beneficiaries about the Medicare prescription drug coverage (Part D) following its inception, literature on beneficiaries’ responses to Medicare Part D education is limited. Objectives: To describe beneficiaries’ assessment of outcomes (learning, enrollment decisions, confidence, and satisfaction) after Medicare Part D Education. Methods: This cross-sectional, IRB-exempted study included convenience sample of beneficiaries seeking assistance at an agency, which is funded through the Senior Health Insurance Information Program (SHIIP) to serve five counties in Nebraska. Items on the paper pen anonymous survey, voluntarily completed by beneficiaries from November 15, 2005 to June 15, 2006, following face to face education by a SHIIP-trained volunteer counselor on Medicare Part D included questions on: outcomes (learning about the benefit design, enrollment decisions, self reported confidence; satisfaction with and time spent for education received); information resources (SHIIP and pharmacy services) for education; and demographics (age, gender, education, current prescription drug coverage, number of medical conditions and medications). Results: 511 beneficiaries responded: 92% Caucasian, 64% female, 58% aged 75 years and above, 52% had high school education or less, 51% receiving 5 or more medications, >50% reporting at least one chronic medical condition, and 61% with no prescription drug coverage. Using SAS ver9.1, complete descriptive statistics of beneficiaries’ responses will be analyzed and presented. Implications: In the context of limited prior information, this is one of the first studies describing beneficiaries’ responses about Medicare Part D education outcomes, and has implications for assessing future health insurance education programs.

ACPE 2007 Standards and Guidelines and Service-Learning Outcomes. Kevin R. Kearney, Massachusetts College of Pharmacy and Health Sciences - Worcester. Objectives: To assess learning outcomes of a Service-Learning (SL) course and align them with the new ACPE Standards and Guidelines. Methods: As part of ongoing efforts to evaluate learning outcomes from service-learning, a post-course assessment tool was administered to P1 students in a required SL course in the fall of 2006. Approximately 195 students were enrolled in the course, on two campuses. Results of previous assessments have been published (Kearney, K.R. [2004], Amer. J. Pharm. Ed. 68, Article 29, 1-13) and presented at the AACP 2007 Interim Meeting (Kearney, K.R., “A Service-Learning Course for P1 Students and its Educational Outcomes,” invited panel presentation). The Fall 2006 survey took a further step toward the objective assessment of learning by asking the students to articulate what they had learned in specific areas: communications, cultural competence, issues related to aging, issues confronting children, and homelessness. When the results are analyzed, they will be aligned with the 2007 ACPE Guidelines. Results: The students’ responses demonstrate clear learning outcomes from the SL course. The poster will highlight those outcomes, and by doing so will demonstrate the efficacy of Service-Learning as a pedagogical tool for achieving the learning outcomes specified in the new ACPE Guidelines. Implications: The study demonstrates the educational efficacy of SL. For current practitioners of the pedagogy, it will provide evidence to support the value of their work. For others, it will offer ideas about how the incorporation of service-learning in courses and curricula may offer new ways of achieving important learning outcomes.
Application of the Immediate Feedback Assessment Technique (IF-AT) for Group Learning in a Therapeutics Course. Mary M. Piascik, University of Kentucky; Eleonora R. Bird, University of Kentucky. Objectives/intent: *Implement an active, problem solving method for teaching large groups of students with limited resources. *Improve student learning by utilizing immediate, corrective feedback. Methods/process: 130 students are placed into 24 groups of 5-6 students. Students prepare for the exercise by reading assignments and/or lectures. During the class hour, students receive a patient case that applies information learned during their advance preparation. Students individually answer a series of multiple choice questions based on the case. Students then work as a group to repeat the exercise by discussing the questions and coming to consensus on the correct response. Answers are recorded on the IF-AT form, a scratch off version of the scantron answer sheet. A star indicates the correct answer. If incorrect, the student group can choose a second or third choice for partial credit. Each student receives the grade achieved by the group activity. Results/outcomes: Application of the IF-AT improved student attendance. Faculty who used the technique reported that groups were fully engaged in the process. Data from student surveys will be analyzed prior to the July meeting. Implications: Application of the IF-AT process permits one instructor to conduct group learning in a large class with little or no assistance. Students are fully engaged in problem solving with immediate feedback on their performance. The IF-AT is well-suited to progressive activities where students need to discern the correct information before proceeding to the next step. This process can be used in a variety of disciplines within the pharmaceutical sciences.

Building and Increasing a Community of Underrepresented Minority Health Professions Students. Clara Awe, University of Illinois at Chicago. Objectives: Describe and evaluate a high school health professions partnership program between the University of Illinois at Chicago College of Pharmacy, CVS/pharmacy, and the Chicago Public Schools, to increase the number of minorities in the field of pharmacy. Program Structure: Eight-week intensive academic development, and pharmacy technician internship program. Structured activities support objectives and research literature for the development of potential pool of minority students entering the health professions especially pharmacy. A curricular approach with highly specific objectives that support nurturing, communication, collaboration among students and faculty, mentoring; and modeling the use of reflective journals was incorporated into the program. Results: Descriptive statistical analysis showed that the cohort of 25 students that participated in the 2005 program was very homogeneous. The qualitative responses from the students showed that they considered themselves to be smart, have high self-esteem, hardworking, caring, outgoing, funny, dedicated to creating value in society, have above average views on international issues and, participated in extra-curricula activities more that 20 hours a week. All 25 of the program participants were admitted to various universities and most with full scholarships. Seventeen of the 25 are in-pre-pharmacy curriculum in various universities. Two of the students are currently enrolled at the University of Illinois Guaranteed Professional Program Admissions, a stellar program that admits competitive high school students directly into a professional or graduate program of their choice, for pharmacy. Implications: This program could serve as a model for other health profession schools interested in increasing their minority student enrollment.

Development and Evaluation of a Marketing Plan Project in a Pharmacy Operations Management Course. David P. Zgarrick, Midwestern University – Chicago; Kari Dabbert, Midwestern University-Chicago; Jaime Hendrickson, SuperValu Pharmacies. Intent: To describe and evaluate a marketing plan project developed in collaboration with representatives from a grocery-store chain pharmacy. Process: The course director of a Pharmacy Operations Management course and clinical service managers from a local grocery-store pharmacy chain developed five cases involving marketing issues related to their services (diabetes care, pain management, respiratory care, immunizations, HIV/AIDS). Forty student groups (five students per group) developed marketing plans addressing issues described in their case. Groups were required to write a paper and give a 15 minute presentation describing a marketing plan for their service. Marketing plans were evaluated by faculty and five clinical service managers. Project evaluations were performed among students and clinical service managers. Outcomes: Groups presented many unique ideas for the issues in their cases. Student performance met or exceeded faculty and clinical service manager expectations. Preliminary project evaluation results indicate that students felt the cases were realistic, instructions were clear, group sizes appropriate, and evaluation criteria fair. Students expressed concerns about the contributions of group members and the amount of time between the end of the marketing unit and when the presentations were due. Clinical service managers were impressed with student ability to understand the issues in each case and the creativity of marketing strategies presented. Managers were concerned about the feasibility of some plans given the grocery-store pharmacy environment. Implications: Learning outcomes were documented among students, faculty and clinical services managers. Lessons learned from the evaluation will be used to modify the project in the future.

Development of a Distance Education Policy and Procedure Manual. Kelly L. Scolaro, University of Florida; Lisa D. Inge, University of Florida; Renee L. Rose, University of Florida. Purpose: To describe the need and development of a policy and procedure manual as part of the distance education continuous quality improvement process (CQI) Methods: In 2002 the University of Florida developed a distance learning program at 3 sites. The curriculum includes on-campus active learning duplicated at all campuses. As the number of students and classes offered at each distance campus grew, the details of coordinating became extensive. Over time, several systems were implemented by the Distance, Executive, and Continuing Education (DCEE) team to ensure quality and consistency. Examples include distance campus liaisons (liaison between distance sites and course coordinator), end of semester debriefing meetings, and facilitator training programs. During the CQI process, inconsistencies were discovered and the DCEE team determined the need for policies and procedures to assist with consistent course implementation. The Assistant Directors were tasked with identifying content and writing a manual. Results: The Distance Campus Policy and Procedure manual was produced in 8 months with input from the entire DCEE team. The document was reviewed by the Dean for comment and approval. The manual was launched January 2007. Content included policies and procedures for both the course liaison and course coordinator, in addition to sections regarding facilitator faculty, exams, visitation of faculty and the essential technology requirements. Implications: The reception of the manual by the department chairs and faculty will be fully assessed by a survey. The DCEE team is collecting data to measure the impact of the manual on minimizing inconsistencies in education delivery.

Lessons Learned from an Analytic Assessment of Milestone Examination Procedures. Sharon K. McDonough, Auburn University;
Amy R. Donaldson, Auburn University; Kristen L. Helms, Auburn University; Selena Day, Auburn University. The Harrison School of Pharmacy (HSOP) has a nine-year history of developing and carrying out annual milestone examinations of all students. The goal of this activity to date has been twofold: provide outcomes-based formative feedback on student achievement of the school’s educational outcomes, and develop the methodological processes and expertise needed to move this annual examination process into the realm of high-stakes assessment tied directly to academic progression. Objective: Analyze and assess the HSOP’s experiences and progress in developing and refining OSCE procedures used as Milestone Exams. Method: To describe how the process has evolved in the HSOP, a brief narrative history of changes over the years will be provided. A summary of data will be presented from two survey sources: (1) four years of student evaluations of the Milestones, and (2) evaluations from faculty who participated in grading the Milestones for the first time during in the 2006-2007 academic year. Results: The work in progress thus far indicates overall improvements in the procedure from the perspective of both students and faculty. Implications: Lessons learned and specific recommendations will be offered, and key literature resources will be identified to help other pharmacy schools engaged in, or contemplating, similar efforts.

Medication Therapy Management Services (MTMS) in West Virginia: A Needs Assessment for Pharmacists and Community Pharmacies. Kimberly B. Blake, West Virginia University; S. Suressh Madhavan, West Virginia University; Virginia Scott, West Virginia University. Background: West Virginia University School of Pharmacy is establishing the Wigner Institute to provide training and guidance to pharmacists in West Virginia for the development and marketing of MTMS. Objectives: To assist in Institute program development, a pharmacy needs assessment is being conducted. Methods: The study population consists of pharmacists registered in WV as well as licensed community pharmacies. Data is being obtained using a self-administered mail survey. Surveys will be mailed to pharmacists (907) using a stratified random sample and to pharmacist-in-charge (507) of each outpatient pharmacy. A cover letter explaining the purpose and importance of the study will accompany the survey. The survey consists of five sections: comfort level and current involvement in MTMS; perceived value of services to patients; perceived barriers; potential utilization of development resources; and demographic information. It was constructed and finalized following a review by experts and pilot testing in a convenience sample of pharmacists. Results: A 50% response rate from pilot testing indicated that pharmacists would highly value the Institute provided training and resources related to MTMS. A total of 30 to 40% response rate is anticipated from the survey. The data collected from usable responses will be analyzed and descriptive statistics will be reported. Pharmacist needs will also be analyzed based on type of practice, geographical location, and current level of involvement in MTMS. Implications: The study will provide a validated survey for researchers to use to assess MTMS-related needs and a description of current MTMS-related needs of WV pharmacists.

Pharmacy Implications of Herbal Use in a Latino Patient Population. Kathryn T. Knecht, Loma Linda University; Adriana Arzate, Loma Linda University; Waheed Baqai, Loma Linda University; Claudio Japas, Loma Linda University; Susanne Montgomery, Loma Linda University; Nathan A. Painter, Loma Linda University; Sompon Wanwimolruk, Loma Linda University; Juan Carlos Belliard, Dept. of Global Health, School of Public Health. Objectives: The use of herbal dietary supplements is common in the United States, especially in non-white populations, but is often not reported to pharmacists and other health care providers. This lack of knowledge may impair the ability of the pharmacist to provide optimal care. Thus the objective of this study was to design and implement a tool for investigating herbal use in a predominantly immigrant Latino population. Methods: A survey of herbal use was developed based on herbal literature and two focus groups from the target population, patients at three clinic sites in San Bernardino. The survey was administered to Spanish to 30 patients and after minor revisions, to 20 more. Results: Participants reported confidence in both herbs and modern health care, with 92% having experience with herbs. The primary source of herbal information was older female relatives and no information about herbs came from pharmacists. Herbs, predominantly in the form of teas, were obtained from supermarkets or sources other than US pharmacies. Overall, the herbs used did not mirror those reported in non-Latino populations. Implications: Concern exists regarding the use of herbal medicines, especially in combination with prescription medications. Although pharmacists were not a primary source of herbal information, with targeted education and outreach an opportunity exists for them to monitor concomitant use of herbs and prescription medications by patients to avoid herbal/drug interactions. Such programs need to involve both consumers and pharmacists in their design as both sides need to be educated in its intent, opportunities and limitations.

Women in Pharmacy Focus Group: An Inside Look at the Challenges They Face. Susan R. Winkler, University of Illinois at Chicago, JoAnn Stubbs, University of Illinois at Chicago; Sneh Patel, University of Illinois at Chicago; Shannon L.B. Miller, Mercy Medical Center. Objectives: Identify the challenges women face throughout their pharmacy career and identify methods for addressing these challenges. Methods: A focus group was conducted of women in various stages in their pharmacy career. Participants included: 4 PharmD students, 1 pharmacy resident, 1 pharmacy fellow, 2 industry pharmacists, 2 clinical staff pharmacists, 1 clinical faculty, 1 community pharmacist, 2 senior pharmacy managers, and 1 full professor in pharmaceutical sciences. The forum was held on February 23, 2007 in a conference room at the UIC College of Pharmacy over lunch. Seating was arranged to ensure diversity. Before the session, participants were briefed on the rules of participation, goals of the focus group, and were asked to outline their pharmacy career highlights. The discussion was audio-recorded for reference unless a participant specified that a comment was “off the record.” Discussion was guided to explore four key topic areas: (1) introductions and current positions; (2) definition of balance and the extent to which it has or has not been achieved; (3) disparities between goals and accomplishments; and (4) suggestions for the future. Every participant was asked to comment “around-the-room” on these topics. Related probes guided further discussion under these main points. Key concepts were reviewed with the group before proceeding to the next topic. Results: Results from the focus group and plans for future forums or research will be presented. Implications: Begin a movement for professional change through a series of forums, creation of a women’s network, and/or research to study career experiences and foster advancement in pharmacy.

e-Pedagogy: The Introduction and Use of Podcasting in a Pharmacy Law Course. Joseph K. Bonmaren, University of Wisconsin; Michael E. Pitterle, University of Wisconsin; Lauren M. Buiden, University of Wisconsin; Monica C. Bogenschutz, University of Wisconsin; Lacey M. Mumm, University of Wisconsin; Carlee J. Adamson, University of Wisconsin; JeongSun (Monica) Hwang, University
of Wisconsin. Objectives: To package concepts and specific topics regarding pharmacy law and regulations for dissemination to students via a growing media - podcasting; and to continue to introduce and incorporate technologies into each student’s learning experience.

Methods: Interest in podcasting is growing on many university campuses. Our campus Division of Information Technology offered awards to faculty to support new uses of podcasting in instruction, using combinations of video, graphics, and audio to enhance student learning. We received an award to be used with the second year Pharmacy Law and Regulation course. A podcasting team - consisting of the faculty member, teaching assistant, three professional program students, and several individuals in our School of Pharmacy’s Information Technology (IT) group - proceeded to create multiple podcasts for use in the course during the Spring 2007 semester. The project evaluated the students in the course to learn their technologic abilities, personal interest level, and individual experiences regarding the podcasts. In addition, the project has established processes and procedures that will be used by our IT group with other interested faculty, as well as supporting the use of this technology campus-wide.

Results: This is a work in progress. Data collection will be concluded in May 2007. Evaluation of the project will be completed in June.

Implications: While preliminary in nature, we believe that podcasting provides an opportunity for faculty to enhance learning through the use of a technology familiar to most students.

SCHOOL POSTERS

A Computer Program for Curriculum Mapping and Assessment. Gamal I. Hussein, Loma Linda University. A computer program was designed to evaluate and continuously improve pharmacy education through examining curricular and co-curricular activities. The program, with its links to an Access™ database, was designed in ToolBook™ Script language; it works in Microsoft Windows™ environment. The program hosts data on courses as well as co-curricular activities such as Operation Diabetes, Patient Counseling Competition, and First Aid Certification. The user may import course data from other files or manually enter it. Course fields include description, instructors, textbooks, lecture topics, objectives, competencies, hours devoted to each topic, objective, and competency, and curriculum committee’s review/assessment notes. A set of 101 competencies that are linked to course fields represents ACPE standards, NAPLEX competency statements, medication therapy management activities, and school-specific curriculum outcomes. Assessment of curriculum may be completed by utilizing the program to answer questions such as 1. Which courses cover a specific competency at different academic years and what number of hours are devoted to this activity; 2. What competencies are covered in a specific course and what other courses contribute to the development of this competency; 3. Which courses or instructors cover a specific lecture topic and what are the stated objectives; and 4. What are the comments made by the curriculum committee while evaluating a specific course. The program was instrumental to our school in identifying areas for improvement. The computer program received a good review by the Accreditation Council on Pharmaceutical Education.

A Roadmap to Success - Continuous Quality Improvement. Eleanora R. Bird, University of Kentucky; William C. Lubawy, University of Kentucky; Frank Ronaneili, University of Kentucky; Kenneth B. Roberts, University of Kentucky. The University of Kentucky College of Pharmacy implemented a curricular mapping strategy for systematic alignment of program objectives in order to provide students interrelated courses and a cohesive set of experiences. Using ACPE Standards 2000, matrices aligning the college mission, program outcomes, course objectives, and student learning objectives were developed and completed by faculty and key personnel. The process affords faculty the opportunity to solidify the relationship between what students do in their courses and what they are expected to learn. Analyzing the alignment of program, course, and student learning outcomes as well as objectives may identify areas where gaps exist and curricular changes may enhance student learning.

A Staged Interdisciplinary Curriculum to Optimize Pharmaceutical Care. Mark A. Penn, Northeastern Ohio Universities; Robb W. McGory, Northeastern Ohio Universities; Cornelis J. Van der Schyf, Northeastern Ohio Universities; David D. Allen, Northeastern Ohio Universities; Janis J. MacKichan, Northeastern Ohio Universities. The Northeastern Ohio Universities Colleges of Pharmacy (COP) and Medicine (COM) have created a vision for a model of interdisciplinary education. Our goal is to graduate professionals who understand and share responsibilities ultimately resulting in improved care for the population of northeast Ohio. The curriculum is designed to optimize contact between pharmacy and medical students in didactic courses (5 major courses are shared), active learning exercises and patient care experiences. The COP curriculum is staged according to themes that focus on dosage forms (Year 1), medication use systems (Year 2), medication safety (Year 3) and disease interventions (Year 4). Didactic courses will integrate with Pharmacy Patient Care Experiences each year to allow application of pertinent principles in community care, acute care, ambulatory care and home care environments. The COM has a similar stepped didactic process and longitudinal experience. Pharmacy and medical students will learn in teams and be assessed in literature evaluation, physical examination, and interviewing skills using an OSCE format. Each terminal ability, course or lecture objective, assigned duty, clinical assessment and test question will be categorized by disease state, Bloom’s taxonomy and year taught to allow curricular mapping of topics, critique of individual student progress and global programmatic assessment. Throughout the program, the core values of our institution, the 5 Cs of Competence, Communication, Caring, Character and Community will be stressed. The outcomes of shared experiences will be examined over the next 4 years to improve interdisciplinary education and team-oriented care of patients.

Achievement of Curricular Performance Objectives Based on Preceptor Evaluations and Student Documented Interventions During APPEs. Sian Carr-Lopez, University of the Pacific; Pamela A. Moise-Broder, University of the Pacific; Eric G. Boyce, University of the Pacific. Background: Advanced pharmacy practice experiences (APPEs) serve as the culmination of students’ professional development and are a rich source of assessment data. Objectives: The achievement of curricular performance objectives was evaluated using data reported by preceptors on grading rubrics and interventions documented by students during APPEs. Methods: Curricular performance objectives were mapped to items on APPE grading rubrics and categories of documented student interventions using 4 major domains: professional, communications, practice management, and...
An Employer Survey as a Pharmacy Curriculum Assessment Tool. Joseph E. Biskupiak, The University of Utah; Donald K. Blumenthal, The University of Utah; Thomas E. Cheatham, The University of Utah; Frederick S. Albright, The University of Utah; Mark A. Munger, The University of Utah; Freddy M. Creekmore, The University of Utah. Background: The 2007 Accreditation Council for Pharmacy Education (ACPE) Standards require colleges to assess the effectiveness of their curriculum by involving “the full range of relevant internal and external stakeholders”. As part of our college’s assessment, we surveyed employers state-wide to assess how well the college’s recent graduates fulfilled the professional competencies and outcome expectations outlined in the ACPE standards. Methods: Surveys were sent to the 237 pharmacies in Utah, requesting completion if they employed a pharmacist who graduated from the College within the last 3 years. Recipients were asked to rank the graduate’s professional competency (on a scale of 1 - 4, 3 and 4 being competent) in ten areas (patient care, population care, management, collaboration, professionalism, interprofessional communication skills, oral/written presentation and public communication skills, etc) outlined in the ACPE standards. Results: Sixty-two (26%) surveys were returned. Forty-eight (77%) were from community, 10 (16%) from hospital and 4 (6%) from other types of pharmacies. Fifty-nine respondents (95%) agreed that the graduates are well-prepared for a pharmacy career, but fourteen (22%) commented that a minority of the graduates occasionally acted unprofessionally (disrespectful behavior, arrogance, etc). Community pharmacies ranked the graduate’s professional competency higher (mean of 3.38) than did the hospital pharmacies (mean of 2.91) in the 10 areas. Implications: In areas where less than 90% of the respondents agreed that graduates were competent, the professional curriculum is being examined to consider possible improvements. The results are being shared with faculty and will form the basis of a discussion with the professional students in the Introduction to Clerkship course.

Butler University’s Experience With Pharmacy Communication Across the Curriculum. Mary H. Andritz, Butler University; Theresa A. Salazar, Butler University; Angela V. Ockerman, Butler University; Stephanie L. Enz, Butler University; Kenneth C. Wichman, Butler University; Darin C. Ramsey, Butler University; Bruce G. Hancock, Butler University. In 2004, the Butler College of Pharmacy Curriculum Committee began curricular mapping. The faculty completed two survey instruments summarizing their courses and identifying which of the College’s Curricular Outcomes and specific content areas their courses addressed. During 2005, the Committee summarized the data and identified five curricular threads: (1) skills development for pharmacy operations, (2) communication skills, (3) quantitative and logical thinking, (4) application and uniformity of foundational principles, and (5) health and health systems management. During a 2006 retreat, faculty teams identified potential areas of collaboration and possible solutions to address gaps and redundancies related to each of the curricular threads. The objective of this poster will be to present the mapping results related to one of these curricular threads: communication skills. Attention will be given to the following components: empathy, oral communication/counseling skills, interprofessional communication skills, and oral/written presentation and public communication skills. Over 25 student communication activities spanning the pre-professional and professional curricula have been identified. Specific examples emphasizing the collaborative and independent activities will be presented. These exercises reinforce student communication skills consistent with ACPE Standards 11, 12 and 13 and illustrate our College’s integrated cumulative approach to learning.

Capstone Examination for Measurement of CAPE Educational Outcome Attainment. Ceressa T. Ward, Nova Southeastern University; Graciela Armayor Nova Southeastern University; Sean T. Leonard, Nova Southeastern University; Lisa Deziel-Evans, Nova Southeastern University. The Capstone Examination (Capstone) is a programmatic outcome measure for the didactic portion of the College’s Pharm.D. curriculum. The 2004 CAPE Educational Outcomes provide the framework for the examination. The Capstone is an online examination comprised of 200 multiple-choice items, and it is administered at the conclusion of didactic course work. Capstone scores are currently reported using five scales that have been developed and refined for internal consistency. The Total Score scale, derived via factor analysis, is the strongest single metric for overall Capstone performance. Remaining scales are content-aligned to the CAPE outcomes, especially in the areas of Pharmaceutical Care. New scales in the areas of Systems Management and Public Health are under development. In addition to possessing reliability, Capstone scales allow scores to be reported according to local norms. Student performance is analyzed for case validity (adequate effort, consistent responding, etc.) and scores are reported as both percentile ranks and standard scale scores. Capstone undergoes continuous review and revision, including: Bias analysis for language and gender; individual item characteristics such as facility and distracter analysis; content validity and item accuracy; and item development and field testing. A significant strength of the Capstone is that its sound psychometric properties allow for greater confidence in the interpretation of results. This permits valid conclusions to be made regarding improvements in student learning from year to year, and to conduct meaningful comparisons between student sub-groups or programs. A challenge inherent to the Capstone process is the development of new test items.

Closing the Loop: Curricular Mapping Strategies in the Auburn University Harrison School of Pharmacy. Paul W. Jungnickel, Auburn University; Kristi W. Kelley Auburn University; Sharon K. McDonough, Auburn University; Amy R. Donaldson Auburn University; Karen F. Marlowe Auburn University; Jack DeRuiter, Auburn University. The central goal of the Harrison School of Pharmacy (HSOP) is to provide a curriculum that ensures graduates can establish a remunerable pharmaceutical care practice that improves primary health care to Alabama citizens. To meet this charge, our curriculum has historically evolved in response to changing needs within the profession. In 1997, HSOP enrolled its first entry-level
PharmD class, with a curriculum based upon four general and six professional ability-based outcomes developed by the faculty. Over the following seven years, ongoing assessment of the curriculum resulted in incremental curricular changes. However, various factors (e.g., increased pre-pharmacy requirements, development of an educational philosophy and new HSOP ability-based outcomes) resulted in a new curricular structure, which was implemented in Fall 2005. The new curricular outcomes resulted from the collaboration of faculty and stakeholders including practitioners, alumni and students who went through the DACUM process to answer the question, “What do we want our graduate pharmacists to look like?” Based upon the outcomes produced from their efforts, a revised curriculum was designed to promote knowledge integration and contextual learning throughout the entire Doctor of Pharmacy program. Procedures employed thus far for developing outcomes and curricular mapping of courses and assessments are described, (e.g., course peer review, activity and knowledge tables related to curricular outcomes, instructor reflection), as well as future plans to refine these procedures. Relevant literature sources are identified, and recommendations are shared from lessons learned in the HSOP regarding what has worked well and what has fallen short of our expectations.

Comparison of Individual Students’ and Preceptors’ Global Assessments of Students’ Preparation for Entry Level Practice. Carol Anne Motycka, University of Florida, Renee L. Rose, University of Florida; L. Douglas Ried, University of Florida; Michael W. McKenzie, University of Florida; Cary Mobley, University of Florida; Kenneth B. Sloan, University of Florida; Michael J. Meldrum, University of Florida. Introduction. Assessment of students’ practice competencies are an essential component of a college’s curricular assessment activities. Comprehensive programs use a combination of strategies, including individual and global assessments. The UF College of Pharmacy surveyed individual students regarding their personal perceptions of “how well prepared” they are to enter into practice. The advanced practice experience preceptors also were surveyed regarding their global impressions. The objective was to compare the students’ self-assessments with the preceptors’ global assessments. Methods. Fourth professional year students completed an internet-based survey just before graduation. Students provided self-assessments for 41 entry-level, practice-based skills included in the college’s curricular competencies. At the same time in 2006, all of the advanced practice preceptors were asked for their global assessment of the students’ preparation. The responses were on a 5-point Likert scale ranging from poor to excellent. Descriptive statistics and mean comparisons using Student independent t-tests (p < .05) were calculated using SPSS. Results. Students’ and preceptors’ assessments differed significantly on 15 of the competencies (36.6%) and the students’ assessments were generally higher (n = 10) than preceptors’ global assessments. However, when students’ assessments were higher than preceptors’ assessments, it was by less than one-half standard deviation. When preceptors’ assessments were higher, it was by more than one-half standard deviation in 3 of the 5 instances. Conclusions. More often than not, students’ and preceptors assessments of clinical competency were comparable. When students’ perceptions of competency were higher, the question of whether it was an educationally meaningful difference needs to be examined.

Competency Development in Pharmacotherapeutic Planning Through SOAP Cases. Curtis D. Black, The University of Toledo; Kimberly A. Schmude, The University of Toledo; Laurie S. Mauro, The University of Toledo. Assignments in an existing P-3 laboratory course series have been integrated as a component of the (formative) assessment process in the doctor of pharmacy program at the University of Toledo. The course series develops skills in physical assessment, drug-related-problem identification and management, and pharmacotherapeutic planning. Competency in these areas is achieved largely through a series of patient SOAP (subjective, objective, assessment, plan) cases. The SOAP cases are written by the therapeutics instructors who are providing the concurrent Pathophysiology/Pharmacotherapeutics (PPT) course instruction with the assistance of the course coordinator who assists with key development. A series of 6-8 SOAP cases is utilized over a semester. The cases are written at levels of increasing difficulty with increased numbers of patient problems and drug-related problems as the semester progresses. The course coordinator and PPT instructor spend approximately 8 hours combined per case in case/key development. P-4 doctor of pharmacy teaching assistants spend approximately 30 minutes to grade each individual student’s SOAP exercise. Common points of confusion are summarized by the teaching assistants and submitted to the course coordinator with the graded assignments for appropriate additional instruction. The key to each SOAP case is reviewed with the class and possible therapeutic alternatives are discussed. The effectiveness of the series of SOAP cases at developing the student’s pharmacotherapeutic planning skills is documented by increasing scores throughout the semester despite increased complexity of patient cases. Additional SOAP cases are incorporated into the second PCR course at a higher level of difficulty.

Core Competencies Mapped throughout an Experiential Program Curriculum. Michael B. Doherty, University of Cincinnati; Andrea L. Wall, University of Cincinnati; Bethanne Brown, University of Cincinnati. The experiential program curriculum at the University of Cincinnati was developed so that students as early as the first year would begin to learn and apply many of the core competencies that are necessary to competently practice pharmacy. Concepts that are learned in the classroom and laboratory and actively applied in the Introductory Pharmacy Practice Experiences can be reinforced so that when the student begins Advanced Pharmacy Practice Experiences they are prepared to approach these concepts at higher levels of learning. Competencies such as drug information, patient counseling, medication therapy management and documentation of care are practiced and evaluated during all four years of the PharmD program through a variety of different activities depending on their year in the program and type of professional experience. Mapping these core competencies as well as many others provide a way to assess the relationship of didactic instruction to experiential learning and, ultimately, preparedness for practice.

Correlation of Key Issues Utilizing Curricular Mapping With Outcomes Surveys and Senior Exit Interviews. Gayle A. Brazeau, University at Buffalo; Daniel A. Brazeau, University at Buffalo; Sara E. Renzi, University at Buffalo; Patricia M. Grace, University at Buffalo; Karl D. Fiebelkorn, University at Buffalo. Objective: Our integrated assessment strategy includes curricular mapping, quantitative and written responses from curricular outcomes surveys and senior exit interviews. The goal was to identify strengths/limitations in our curriculum and to evaluate the educational climate in our school. Methods: Curricular mapping was conducted with the required course elements in the P1-P3 years by one-on-one interviews with course coordinators and analysis using Excel. Since 2002, graduating seniors have completed surveys on-line that asked their perception to perform curricular outcomes developed based upon CAPE outcomes and to provide written comments. We have recently implemented one-on-one senior exit interviews to identify issues on the
Committees jointly developed an “Abilities Inventory” form to collect data from students. This form was used in 1999 and again in 2005. The Curriculum and Assessment Committee of the University of Mississippi used this data to assess student development of abilities throughout the curriculum. To monitor the professional curriculum and educational environment, Wilson, et al., (2007) developed a curriculum mapping tool. This tool helps instructors to improve the quality of instruction and student achievement. The tool also helps in identifying and revising educational and professional literature.

Course Assessment Reports (CARs): Using an Evidence-based Process to Enhance Student Achievement of Ability Outcomes. Tricia M. Berry, St. Louis College of Pharmacy; Brenda L. Gleason, St. Louis College of Pharmacy; Julie A. Murphy, St. Louis College of Pharmacy; Charles T. Taylor, St. Louis College of Pharmacy; Thomas. D. Zlatic, St. Louis College of Pharmacy. St. Louis College of Pharmacy’s six professional ability outcomes (Thinking & Decision Making, Communication, Self-Learning, Social & Professional Responsibility, Social Interaction, and Valuing & Ethical Decision Making) are mapped with progressive performance levels to both didactic and experiential courses. The Course Assessment Report (CAR) process was devised to provide 1) a mechanism for instructors to reflect on student performance relative to these outcomes, 2) a forum for discussion and feedback from peers regarding course enhancements, and 3) a method to implement course changes in a timely manner. At the conclusion of each semester, course coordinators complete a CAR using a standardized template that prompts them to summarize key elements of student achievement of course outcomes; describe learning assignments and practice opportunities; and showcase specific assessment criteria, rubrics, and other unique aspects of the course. Additionally, coordinators list course strengths and areas for improvement and begin to plan evidence-based course changes as supported by the educational and professional literature. The Student Success Team (a department committee comprised of pharmacy faculty) systematically analyzes all CARs to ensure consistency of performance criteria, student achievement of outcomes at progressive levels, and proper mapping of ability outcomes and performance levels across professional courses. Global recommendations are forwarded to the Department Chair, Dean, and college assessment committee. More specific recommendations are provided to the course coordinators to improve the quality of instruction, maximize student achievement of ability outcomes, and enhance efficiency of course delivery.

Curricular Mapping at The University of Mississippi. Marvin C. Wilson, The University of Mississippi; Alicia S. Bouldin, The University of Mississippi; Bonnie A. Avery, The University of Mississippi. The University of Mississippi School of Pharmacy faculty approved nine general educational and nine professional abilities as stated outcomes of its professional curriculum. To monitor the provision of educational opportunities for student development of those abilities throughout the curriculum, a mapping process was undertaken in 1999 and again in 2005. The Curriculum and Assessment Committees jointly developed an “Abilities Inventory” form to collect data from current instructors regarding the specific abilities that were practiced/fostered in each course in the professional curriculum. Encouragement from departmental representatives on the curriculum committee and even personal interviews by a single committee member were used to achieve 100% participation from instructors. A comprehensive “Abilities Inventory Summary” was then compiled from gathered data. This summary was transferred to graphic form as a “Curricular Map,” consisting of a network of boxes (one for each course). This reduced the data to a manageable size and enabled a crude visualization of gaps or limited opportunities for development of certain abilities. Some abilities were obviously represented in a large number of courses; while for other abilities, students had numerically fewer distinct opportunities for exposure within the curriculum. Evidence provided by the map contributed to the design of the early practice experience requirement that was added to the curriculum in 2002. The curricular map continues to inform the Curriculum Committee, and has aided the Assessment Committee in its efforts to identify areas of opportunity for course-embedded assessments for various abilities included in the programmatic assessment plan.

Curricular Mapping: Linking Program-Level Ability-Based Outcomes to Courses in the Pharm.D. Program. Katherine A. Kelley, The Ohio State University; James D. Coyle, The Ohio State University; Sylvan G. Frank, The Ohio State University; James W. McAuley, The Ohio State University; Lane J. Wallace, The Ohio State University. During the 2005-2006 school year the Curriculum Committee undertook the task of mapping the professional curriculum. The goal was to create a map linking the program-level ability-based outcomes to the courses in the Doctor of Pharmacy Program. The committee paid careful attention to the process for gathering the information from faculty as well as the required elements of the final product (completed map). The Director of Assessment met with groups of faculty according to the course sequences in which they taught. The meetings consisted of an explanation of the process and the eventual use of the information gathered. Faculty then independently mapped their respective courses and reconvened in the original groups to discuss their course maps. For each program-level ability-based outcome, faculty were asked to rate three categories, (1) the degree of connection between the course and outcome, (2) how the outcome is taught and (3) how the outcome is assessed in the courses that they teach. The final map was assembled and is currently under review by the Curriculum Committee. Findings from the analysis of the map and implications for program level improvements will be presented.

Curricular Mapping of Course Outcomes to Educational Objectives: A Comparison of Faculty Intent and Student Perceptions. Renae J. Chesnut, Drake University; Charles R. Phillips, Drake University; Jane E. DeWitt, Drake University. Objective: To compare faculty intent and student perceptions regarding the curricular mapping of course objectives to the College’s educational objectives. Method: Students were asked through an online survey to select the courses they had completed during the prior year that covered the College’s 21 educational objectives. Comparisons were made to the curriculum mapping exercise, previously completed using the faculty’s selection of educational objectives that mapped to their course outcomes. Outcomes: While faculty intent and student perceptions did not match exactly on some of the objectives, there was congruence in a number of the objectives. Similarities can be attributed to 1) students’ recall of course embedded assessments that match the College’s educational objective, and 2) the specific educational objectives are specific in nature rather than general (e.g. communicating with patients whose culture is not Western vs. problem-solving).
and therefore easily attributable to a specific course. Differences could be attributed to 1) students lack of awareness that they are being assessed on the College educational goals when completing their course assignments, 2) the objective being covered at a lower level in the course, or 3) the course contributes to only a part of the objective (e.g. develop, justify and monitor pharmaceutical care plans). This process confirmed the mapping process completed earlier by the faculty and identified courses and objectives for further review.

Curriculum Matrices: A Useful Tool for Defining and Measuring Curricular Outcomes. Corinne C. Ramaley, Hampton University; Vera C. Campbell, Hampton University; Tonya S. Martin, Hampton University; Francis A. Ndemo, Hampton University; Sushma Rangnighani, Hampton University; Alaba M. Ogundadeni, Hampton University; Hugh M. McLean, Hampton University. Objectives: In accordance with the Hampton University Assessment Plan, the School of Pharmacy (SOP) developed curriculum matrices to define student outcomes for each course in the curriculum. The matrices are linked to the essential SOP program competencies and are being used by faculty to develop 1) individual course assessments and 2) a case-based annual exam. Methods: Curriculum matrices were developed for every didactic and experiential course offered in the pharmacy curriculum. In the first tier, the matrices identify which of the eight essential SOP program competencies are covered by the course objectives. In the second tier, the course objectives are linked to learner activities. In the third tier, learner activities are tied to specific minimum student competencies. Evaluative measurements are listed in the fourth tier. Results: All syllabi in the School of Pharmacy are now prepared according to a standardized syllabus template, which is based on the curriculum matrices. The course objectives, learner activities and student competencies pertaining to a specific course are included in the syllabus, along with the Bloom’s Taxonomy performance level at which the competency is assessed. Faculty prepare assessments that are directly linked to the competencies listed in the curriculum matrices and are encouraged to incorporate problem solving, critical thinking and application exercises in their assessments. A case-based annual exam, directly linked to the curriculum matrices, is being written with input from every SOP faculty member. Implications: Curriculum matrices are a powerful tool to define student learning outcomes and to ensure rigorous academic performance standards.

Determining Change in Knowledge and Skills about Disease Management Programs in 5th Year Pharm.D. Students. David Lesch, The University of Toledo; Sharrel Pinto, The University of Toledo. Objectives: To determine a change in knowledge and skills of fifth year Pharm.D. students at the University of Toledo after taking a class on developing, implementing, and evaluating a disease management program. Methods: Before and after study design using a questionnaire completed at the beginning and end of a disease management course (PHPR 6550: Management Topics for Clinical Practice). The questionnaire had 4 sections, 70 pretest and 84 post-test questions focusing on knowledge and skills. Data was entered and analyzed using SPSS v 14.0. Results: Ninety-five students completed the pretest and 69 students completed the post-test. There was an overall increase in average knowledge and skills about disease management programs after students completed the course. Conclusion: Classes that focus on disease management programs can significantly increase the knowledge and skills about those programs for PharmD students who will soon be entering their professional careers expected to perform these services.

Developing Research and Analytic Skills by Combining Drug Information and Literature Evaluation Throughout the Curriculum. Kathleen H. Besinque, University of Southern California; Steven W. Chen, University of Southern California; Jeffrey S. McCombs, University of Southern California. Developing well-researched responses to drug related questions is an essential skill for pharmacists requiring professional and technical competence in addition to general abilities. The USC School of Pharmacy is linking the general abilities (thinking, communication, analytic skills) to professional competencies (pharmaceutical care, public health and systems management) using a longitudinal approach to drug information and literature evaluation. The foundation for building these competencies is a newly revised drug information/biostatistics course in year two of the curriculum. The new course is taught by an interdisciplinary team of faculty. The skills and abilities learned in the foundation course will be reinforced throughout the curriculum from the Therapeutics modules to the Advanced Practice Experiences. The foundation course covers research design and analytical methods using 8 articles selected from contemporary practice literature. Students are assessed using a series of quizzes covering: (1) experimental research designs, (2) observational designs, (3) sampling and measurement, (4) descriptive and univariate statistical tests, and (5) multivariate statistical methods. In addition, three drug information questions are given the start of the semester that will assess the students analytical and communication abilities at the end of the course. The final exam is one of the three drug information questions drawn at random. The foundation course serves as the base for later courses requiring the students to research practice related issues and communicate their findings. Combining drug information skills and literature evaluation links general abilities to professional outcomes that can be reinforced throughout the curriculum.

Developing a Curricular-Based e-Portfolio: Planning and Implementation. Susan M. Meyer, University of Pittsburgh; Deanne L. Hall, University of Pittsburgh; Denise L. Howrie, University of Pittsburgh; Kristine S. Schonder, University of Pittsburgh; Melissa A. Somma, University of Pittsburgh; Gary P. Stoehr, University of Pittsburgh. University of Pittsburgh School of Pharmacy students have been required to submit paper portfolios for a number of years to document their progress in meeting the requirements of experiential learning courses. Students commented that the requirements for portfolios were different across years in the curriculum and that connections to the curricular outcomes were not evident. The Curriculum Committee charged a portfolio task force to develop a clear purpose for the portfolio requirement, envisioning that the portfolio could be expanded to assess student progressive development across the entire curriculum, not just the experiential program. The task force was also asked to determine what curricular outcomes could and should be measured through the portfolio process and to develop a system for monitoring and assessing the portfolio. The task force outlined the purpose and structure of the portfolio, and made recommendations for monitoring and assessment. The task force suggested that an electronic platform was needed to capture and organize data and make the portfolio process more efficient for students and faculty. A pilot project with a commercially available e-portfolio template was implemented in spring 2007. Student volunteers from the first and second year classes, working with a small group of faculty mentors, transformed their paper portfolios to an e-portfolio structured format. In addition to sample assignments, students completed periodic self-evaluations of mastery of the curricular outcomes and a cumulative inventory of specific activities (type and frequency) in
which they engaged in patient care settings. Data from the pilot project will be presented.

Developing Ability-based Outcomes and Mapping Them Across the Curriculum. Michael J. Gonyeau, Northeastern University; Jennifer M. Trujillo, Northeastern University; Judith T. Barr, Northeastern University. Objectives: a) Develop Northeastern University ability-based outcomes b) Map the curriculum to the ability-based outcomes c) Utilize mapping results to modify curricular content, delivery and sequencing. Methods: The assessment and curriculum committees jointly developed 23 ability-based outcomes (ABOs) in 6 domains that reflected contemporary practice, integrated professional and national standards yet highlighted the unique strengths of our school. Course instructors then mapped each course to the ABOs using a 0-4 scale related to content and focus (0 = none 1 = introductory, 2 = intermediate, 3 = major). A master map was disseminated to all faculty. During a half-day retreat, faculty were assigned to one of six tables representing each ABO domain. Faculty were assigned based on department and curricular year in which their course is offered. Each table reviewed the curriculum map and evaluated its ABO domain more comprehensively. Specific questions targeted content placement, sequencing, and content areas requiring further development. Retreat summary statements were reviewed by the curriculum committee. Faculty working groups were formed to address identified areas of improvement and subsequent curricular modifications were made. Results: All professional courses were included in the map. Retreat summary statements indicated that most ABOs were covered well in the current curriculum. Faculty identified three general areas in need of improvement: public/population health, cultural competency, and communication skills. Conclusion: Through our mapping process, we were able to identify areas for improvement in curricular content, delivery, and sequencing. With the completion of this mapping exercise, the school is now attempting to define and measure achievement of our ABOs.

Developing and Mapping School Educational Outcomes (EOs) as the Foundation for a Comprehensive Assessment Plan. Virginia Scott, West Virginia University; Marie A. Abate, West Virginia University; Carla J. See, West Virginia University; Mary K Stamatakis, West Virginia University; Terrence L. Schwinghammer, West Virginia University; Paula Stout, West Virginia University; Grazyna D. Szklarz, West Virginia University. The WVU School of Pharmacy previously developed a learning outcomes assessment plan that required updating. As the foundation for this assessment plan revision, new professional program Educational Outcomes (EOs) were adopted based upon the 2004 CAPE outcomes and Institute of Medicine recommendations. The seven School EOs include: 1) providing individual and population-based patient care, 2) participating in an interprofessional health care team, 3) applying evidence-based approaches, 4) promoting public health, 5) managing health care resources and medication use systems, 6) conducting responsibilities in accordance with professional guidelines and laws, and 7) utilizing health care informatics. There are also eight general ability outcomes (e.g., decision making/problem-solving, communication skills, values and ethics, self-learning). The next step in revising the assessment plan involved identifying each course’s contribution towards achievement of the EOs and mapping this across the curriculum. Sufficient detail was needed in the mapping to identify existing relevant data for the assessment plan, locate gaps in EO curricular coverage, and determine where curricular changes might best be made if deficiencies in student performance are ultimately found. Detailed curricular maps of each EO and the courses addressing them were prepared and included: extent of EO emphasis, level at which the EO is learned, whether performance mastery of the EO is required, whether/how the EO is assessed, and whether assessment data are available in an appropriate format. The mapping information and assessment findings to date provide important information needed during the development of a revised comprehensive EOs assessment plan.

Development and Implementation of a System for Mapping Revised Curriculum Outcomes to Existing Courses in the Doctor of Pharmacy Program. Justine S. Gortney, Mercer University. Objectives: To devise and implement a system for mapping newly revised curriculum outcomes to existing courses in the doctor of pharmacy program utilizing database management software. Background: Curriculum outcomes for our Pharm.D. program were revised in 2006 to assure consistency with the 2004 revision of the CAPE outcomes. The curriculum committee sought to design an efficient method for mapping these revised outcomes to existing courses. Methods: Initially, three different mapping strategies using a combination of Microsoft Excel and Word were considered. The committee presented what they felt was the best strategy to the faculty. Feedback was solicited during a trial for use in several types of courses including pharmacotherapy modules and basic science courses. Comments from faculty were positive and building an Access database was suggested. A database plan was developed and built. Once complete, a faculty member will select from 29 pages of outcomes that are linked to their course utilizing both drop down menus and scroll bars on a form application. The selected outcomes will be able to be classified as “foundational, transitional, or advanced.” Course specific and cumulative reports will be built from the database. Faculty will also be able to identify the breadth and depth of outcomes being incorporated into current college coursework. Faculty perceptions of the mapping process will be assessed. Implications: Use of technology can ease the process of linking revised curriculum outcomes to existing courses and can aid in the generation of reports for assessment of outcome coverage in the curriculum.

Development and use of a 360-degree Curricular Assessment Tool. Marshall E. Cates, Samford University; Pamela J. Sims, Samford University; Mary R. Monk-Tutor, Samford University; Robert M. Riggs, Samford University; Renee M. DeHart, Samford University; Charles D. Sands, III, Samford University. Objectives: The Curriculum Innovations Committee was charged with the task of evaluating the ability of the current curriculum to produce graduates who are competent in the areas identified by the CAPE Outcomes. Methods: A survey was developed based on the CAPE Outcomes 2004 and administered to graduating fourth year students (74% response), faculty (76% response), preceptors (43% response) and alumni from the previous 6 years (33% response rate). Mean scores from all four respondent groups were graphed simultaneously using Spider diagrams in order to identify perceived gaps in the curriculum. Results: In general, students’ self-perceived competence at graduation greater than that of both faculty and preceptors. Alumni’s self-perceived competence at graduation increased with length of time out of school and was statistically significantly higher than other respondent groups on every survey item (p < 0.05). In general, all respondent groups felt graduates were best prepared in the CAPE domains of providing drug information/education and general abilities. Areas identified for improvement included managing medication systems, designing patient education materials, promoting public health, biostatistics, and management. Implications: Results of the 360-degree assessment along with information obtained from a standard
Development of Curricular Outcomes and Curricular Mapping Strategies at the UNC School of Pharmacy. Adam M. Persky, The University of North Carolina at Chapel Hill; Pamela U. Joyner, The University of North Carolina at Chapel Hill; Wendy C. Cox, The University of North Carolina at Chapel Hill; Kimberly H. Deloatch, The University of North Carolina at Chapel Hill. Objectives: In 2006, the faculty of the UNC School of Pharmacy sought to update its statement of curricular outcomes and to initiate a comprehensive curricular mapping process. The goals of this effort were to improve alignment of School outcomes with current CAPE outcomes and accreditation standards; to link defined outcomes to related course-level objectives, teaching and assessment methods, and taxonomy of learning achieved for each objective; and to provide support for strategic “Curricular Renaissance” initiatives. Methods: The Director of Curriculum and Assessment, in consultation with the Curriculum Committee, drafted an outcomes document articulating outcomes in nine areas, outlining parameters for a multi-dimensional curricular mapping process, and summarizing how the outcomes and mapping process will support strategic curricular initiatives and assessment. A consultative process was used to elicit faculty feedback and gain faculty endorsement from each academic division. Results: The document was endorsed by each academic division; final approval by faculty ballot is planned for the next faculty meeting. A consultative process with another college of pharmacy and a software programmer is underway to develop web-based software to manage the curricular mapping process. Implications: The ability to collect and analyze data regarding educational processes and learning outcomes is essential for continuous improvement of the doctor of pharmacy curriculum. Clear articulation of intended outcomes, agreed upon by the faculty, and implementation of a robust curricular mapping system provide firm underpinnings for accomplishing these goals. This poster will provide information regarding our consensus process and progress toward the development of curricular mapping software.

Development of a Chemical Dependency Course: Role in the College of Pharmacy Curriculum. Chris Hart, Ohio Northern University; Donald L. Sullivan, Ohio Northern University. One out of six pharmacists will have a problem with chemical dependency sometime in his/her career. We believe that additional education in the college of pharmacy may help in reversing this trend. The objective of the course is to educate pharmacy students to the dangers of chemical dependency in the profession of pharmacy. The course is taught by a pharmacist in recovery who shares his story during the first class meeting. The syllabus then proceeds with a discussion of why chemical dependency is disease not a moral condition. Risk factors and important signs of an impaired pharmacist are reviewed along with withdrawal symptoms, defense mechanisms and emotions as obstacles to recovery. Students explore the successful methods of twelve-step programs. Legal, professional and personal consequences are explored. Outside speakers are vital in making a link between didactic material and personal experiences. These speakers include the director of the state board of pharmacy, the instructor’s spouse shares how this disease affects the family, and the director of a drug treatment center explains the model of addiction. Students learn issues facing recovering pharmacists returning to the profession and recognize symptoms of relapse. Finally, two recovering pharmacists present their stories. By the end, the students are able to recognize common threads that are woven through every saga of addiction. Their testimonies illustrate how this malady respects neither age nor gender. This approach enables students to identify and avoid the dangers of chemical dependency, the life-threatening occupational hazard of pharmacy.

Development of a Comprehensive Curricular Assessment Plan: Mapping of Assessment Activities to Curricular Endpoints. Harold L. Kirschenbaum, Long Island University; John Papadopoulos, Long Island University; Martin E. Brown, Long Island University; Tina Zerilli, Long Island University. Objective: To develop a curricular assessment plan that systematically assesses the entry-level Pharm.D. degree curriculum with respect to overall content, organization, and student achievement of curricular endpoints. Methods: Using the 2004 CAPE outcomes and the curricular endpoints developed by the College, the Curricular Assessment Committee identified the points throughout the curriculum that the achievement of these outcomes could be assessed and the activities that are best suited for direct and indirect assessment. A comprehensive assessment plan that included the use of focus groups, student/faculty/alumni/preceptor surveys, OSCEs, and standardized examinations was drafted. To identify the extent to which each of the curricular endpoints was being assessed, the committee mapped the assessments to the curricular endpoints. Using Microsoft Excel, a spreadsheet for each professional year was created; the y-axis listed the curricular endpoints and the x-axis listed the proposed assessment activities for that professional year. The next step was to combine these into an all-inclusive spreadsheet. Results: The final map will be used to ensure that all curricular endpoints are being adequately assessed. Implications: The mapping of assessment activities to curricular endpoints and the subsequent development of a comprehensive curricular assessment plan will ensure that all stakeholders possess a clearer visualization of student attainment of expected competencies and the strengths and weaknesses of the program in developing those competencies. This will create a better informed decision-making environment for purposes of improving teaching and learning, allocating instructional resources, and reforming curricula.

Development of a Comprehensive Plan to Measure Global and Curricular Outcomes. Jeffrey C. Delafuente, Virginia Commonwealth University; Cynthia K. Kirkwood, Virginia Commonwealth University; Beverly A. Talluto, Virginia Commonwealth University; William E. Smith, Virginia Commonwealth University; Richard B. Westkaemper, Virginia Commonwealth University; Brigitte L. Sicat, Virginia Commonwealth University. The Outcomes and Assessment Committee at Virginia Commonwealth University School of Pharmacy began the arduous task of developing a comprehensive plan to measure learning outcomes in students, achievement of terminal outcomes as defined in our global curriculum outcome statements, and other outcome metrics required by the 2007 ACPE accreditation standards and guidelines. In early discussions we determined that the responsibility for collecting outcomes data was a joint responsibility of the Curriculum and the Outcomes and Assessment Committees. However, ultimately the students and faculty have a shared responsibility for providing the necessary data needed for assessment. Through a deliberative process the committee reached consensus on the data required to fully assess the global and curricular outcomes and other important measures related to students, alumni, faculty, and external stakeholders. The committee identified 11 major assessment areas that were further subdivided to delineate the assessment measures. The next step in our process was to determine the priority for collecting the data needed and the frequency of data collection. Our comprehensive plan is the initial step to measure a substantial variety of outcomes. We realize this plan is evolutionary and we will update...
it regularly to ensure that evaluation processes are mapped to all curriculum outcomes. Selected measures from our plan will be used to compare outcomes between our satellite and main campuses as well as outcomes between our current curriculum and the totally revamped curriculum to be implemented in 2008.

Development of a Curriculum Management System (CMS), Sunny E. Ohia, University of Houston; Julianna E. Szilagyi, University of Houston; David J. Hayes, University of Houston; Shara L. Zatopek, University of Houston. In the summer of 2005 the University of Houston, College of Pharmacy Curriculum Committee met to develop a 5-year strategic plan for the College. At this planning session the members acknowledged the need to continually insure, through efficient assessment, that the curriculum was dynamically promoting knowledge, skills, ability, and attitude specific to the profession and patient care. Furthermore, the need to map the individual courses specifically their proficiency statements to the College’s Terminal Outcomes along with tracking these outcomes to The Institutes of Medicine Core Competencies, The CAPE Outcomes, and the forthcoming ACPE Accreditation Standards was recognized. To achieve this in a concise and comprehensive manner the committee embarked on the development of the Curriculum Management System (CMS). A prototype database was developed in Microsoft Access® that allowed course coordinators through a form based inventory to determine the relationship of the individual course proficiency to the domains of Bloom’s Taxonomy (cognitive, psychomotor, and/or affective), the method of teaching/assessing, and the relationship to the terminal outcome(s). The committee felt that this activity, completed each time the course was offered, would allow for a continuous quantitative and qualitative analysis of the professional program. After the prototype was tested with several course coordinators, it was converted to a Sequel® platform and templates for syllabi and test schedules were added to enhance usefulness to the faculty. Currently, the implementation phase is being conducted for course coordinators in the fall 07’ semester and initial data analysis will take place once completed.

Development of a Model to Address Longitudinal Learning Outcome Progression Across Competency Domains, Thomas J. Mattei, Duquesne University; Bruce H. Livengood, Duquesne University; Janet Astle, Duquesne University; Elizabeth A. Coast-Senior, Duquesne University. Objectives: The purpose of this initiative is to illustrate the delineation and application of longitudinal curricular student performance outcomes through the use of a disease state model. The identification of these objectives will be demonstrated across curricular domains which were defined by the Duquesne University School of Pharmacy faculty. These domains along with attendant competency statements were developed in alignment with CAPE Education Outcomes, ACPE Standards, the IOM report and the JCPP Future Vision of Pharmacy Practice. Methods: Faculty teams representing the basic science and pharmacy practice disciplines will identify the expected progression of student performance through various stages of the curriculum based on defined competencies for curricular domains. Using diabetes as a disease state model, the team will apply a backwards-design approach in constructing learning outcomes and assessment measures appropriate to the student level in the curriculum. Terminal competencies will define student performance expectations for the fourth professional year; competencies for the third, second and first professional years will be defined along a continuum that assist the student towards mastery of the terminal competency. Bloom’s Taxonomy will guide the development of progressive competencies. Outcomes: A functional template will be developed that can be replicated across various disease states for incorporation in the curriculum. Implications: Application of such a model, which defines competencies at progressive stages of the curriculum, can be utilized to develop accurate assessment measures to ensure that students meet performance expectations. Course content and structure can be developed and modified based on these measures and learning outcomes.

Identifying Predictors of Academic Success in a Doctor of Pharmacy Degree Program, Wallace J. Murray, Western University of Health Sciences; Mark P. Okamoto, Western University of Health Sciences; Sunhil Prabhu, Western University of Health Sciences; Mark Bounthavong, Western University of Health Sciences. Objective: To evaluate possible predictive factors of performance in pharmacy school using admission data. Methods: Admission data were used to determine correlations with high performance or sub-par performance in pharmacy school. Variables evaluated as predictors included science GPA, overall GPA, file score, total interview score, type of college or school (2- or 4-year institution), and degree (AA or BS degree). Evaluated outcomes included average percentage scores during pharmacy school, grades of No Pass for two or more classes or having received High Pass (HP) grades in 10 or more courses in the college. Univariate analyses were conducted to identify possible predictors of student success or failure. Multivariate logistic stepwise regression was used to control for covariates. Significance was set to 0.05. Results: Of the 212 students evaluated (N = 212), overall GPA (p = 0.009), science GPA (p = 0.013), file score (p < 0.001), and total interview score (p = 0.023) were significantly associated with students achieving an average score of 90% or higher in pharmacy school. The only factor associated with student failure was overall GPA (p = 0.002). Factors associated with high performance in pharmacy school (>3 HP) included overall GPA (p = 0.023) and attending a 4-year undergraduate college (p = 0.046). Students with >/= 10 HP grades were significantly associated with both overall GPA (p = 0.002) and science GPA (p = 0.002). Conclusion: In our analysis, higher cumulative average grade was associated with higher successes and lower failures in pharmacy school and a high science GPA was associated with multiple high pass scores.

Implementation of an Abilities-based Competency Examination to Assess Student Preparedness for Advanced Pharmacy Practice Experiences, Joseph M. Brocavich, St. John’s University; S. William Zito, St. John’s University; Candace Smith, St. John’s University; Judith L. Beizer, St. John’s University; Laura Augusto, St. John’s University; Mary Ann Howland, St. John’s University; Michael A. Barletta, St. John’s University; Jerome O. Cantor, St. John’s University; Martha L. Mackey, St. John’s University; Parshotam L. Madan, St. John’s University; Bhogwan Rohera, St. John’s University. Introduction: Faculty of St. John’s University College of Pharmacy and Allied Health Professions, in conjunction with its curricular development toward the entry-level Doctor of Pharmacy program agreed that programmatic and curricular outcomes assessment was an essential part of assuring quality and efficiency of student learning. As part of the overall assessment plan, the faculty mandated that all students must take a competency examination that measures basic competencies and outcomes from the first 4 years of our 6 year program. Additionally, failure of the student to pass the exam would prevent them from starting experiential rotations. This poster will share with the academy the most recent iteration and results of our process. Methods An Ad-hoc committee was charged with developing a standardized, abilities-based examination that encompassed material from the first four years of the curriculum. An oral case-based...
examination was developed where a topic was chosen from common processes covered in the fourth year Drugs and Disease sequence. A list of six minimum competencies derived from national standards of practice was evaluated. A comprehensive, standardized answer key was developed. The Committee hosted a two-part workshop to introduce the material and process to all College faculty. These workshops provided faculty the opportunity to critique the instrument and to participate in simulated administration exercises. Students were given 60 minutes to review the case and prepare appropriate responses. Responses were presented to and graded by two faculty members. A score of 70% was established as the passing grade.

**Innovation in Interprofessional, Community-based Collaboration: A Model to Develop the Essential Academic Infrastructure.** Ann M. Ryan-Haddad, Creighton University; Joy D. Voltz, Creighton University; Marlene Wilken, Creighton University; Caroline Goulet, Creighton University; J. Chris Bradberry, Creighton University; Teresa M. Cochrane, Creighton University; Brenda Copbard, Creighton University. Interprofessional team collaboration to improve public health is a central competency for graduates of health professions programs and a critical substrate underlying contemporary clinical practice. Although curriculum and assessment committees develop learning activities and outcomes for competencies at programmatic levels, as much learning occurs in "extracurricular" activities involving service in the authentic patient care context as does in the explicit curriculum. Consistent with the ACPE and CAPE standards and guidelines, pharmacy students must develop the skills to participate in interprofessional teams to promote health and prevent disease in at-risk communities. Efforts to create systematic, developmental interprofessional learning experiences remain a multifaceted challenge for educators and administrators. Initiatives to promote interprofessional teamwork are successful when approached as a process of cultural transformation rather than discrete, terminal projects, and programmatic resources alone are clearly insufficient to support interprofessional, community-based learning initiatives. To facilitate sustained collaboration, dedicated administrative support must be available in the form of 1) visible infrastructure 2) human capital and 3) role/reward system with adequate flexibility to value faculty innovation in interprofessional teaching, service, practice and scholarship. This presentation will identify key elements to be developed along each of the three dimensions. In addition, an administrative structure will be described that originally emerged via grassroots faculty engagement in community-based interprofessional work. This formal structure and its outcomes have sustained and expanded with dedicated administrative resources and commitment, and it offers a model for other health professions programs attempting to institutionalize interprofessional curricular initiatives.

**Innovative Strategies to Integrate CAPE Outcomes.** Caroline S. Zeind, Massachusetts College of Pharmacy & Health Sciences – Boston; Michael Montagne, Massachusetts College of Pharmacy & Health Sciences–Boston; Douglas J. Pisano, Massachusetts College of Pharmacy & Health Sciences–Boston; Paul DiFrancesco, Massachusetts College of Pharmacy & Health Sciences–Boston; William Lindblad, Massachusetts College of Pharmacy & Health Sciences–Boston; William W. McCloskey, Massachusetts College of Pharmacy & Health Sciences–Boston. The School of Pharmacy-Boston has undertaken initiatives to enhance integration of the 2004 CAPE Educational Outcomes within the curriculum. The recently approved curricular revisions that are designed to better prepare students for their roles in pharmaceutical care, systems management and public health. Innovative models have been developed for patient-centered care within the curriculum. Introductory Pharmacy Experimental Programs (IPEP) expose students at the start of the professional phase of the curriculum to patient-centered care with an emphasis on interdisciplinary collaboration. This model was designed for the Pharmacy Practice Laboratory utilizing teams of first professional year and third professional year pharmacy students assuming the roles of pharmacy technicians and pharmacists respectively. Patient safety concepts are introduced in the first professional year in a Pharmacy Practice Management Course, and in the Pharmacy Practice Laboratory Course. Application of patient safety concepts continues within the second and third professional years of the curriculum, including off campus IPEP rotations in community and institutional settings. The last year of the curriculum offers rotations that emphasize interdisciplinary teams and evidenced-based practices. Pharmacy practice faculty are developing strategies to reduce medication errors at their sites and integrating students within these models. Public health initiatives have expanded within the curriculum. Pharmacy students take required courses that focus on preventive health including Pharmacoeconomics. Plans are underway to expand course content relative to vaccine-preventable diseases and to incorporate pharmacy-based immunization delivery, training, and certification in the required curriculum. A public health/international health rotation is now offered as an advanced pharmacy rotation.

**Integrated from Stem to Stern: Building a “Shipshape” Curriculum.** Eric H. Hobson, South University; James E. Wynn, South University. From its founding, the South University School of Pharmacy (SUSOP) has identified maximum curricular integration as one of the School’s distinguishing features and the core of its educational philosophy. Recent curricular adjustment, following a four-year planning and implementation process, has put the finishing touches on the vessel we imagined early on: a course of study that foregrounds interdisciplinary practice, brings students into multi-year learning teams, and shuttles students between didactic and experiential learning opportunities. The goal of this curricular model is to immerse students into professional pharmacy practice from matriculation to graduation using a carefully-crafted, continuously-monitored, and developmentally-appropriate sequence of learning activities. The SUSOP curriculum features three distinct integrated learning threads: 1. Integrated Professional Skills Laboratory sequence: spanning Quarters 1-4, this required lab sequence provides an interdisciplinary setting for students to practice, apply and connect their learning from across the basic science, pharmaceutical science, social science, and pharmacy practice courses they take concurrently. 2. Integrated Sequence: spanning Quarters 2-4, 6-9, this course sequence blends increasing levels of advanced instruction in the basic and pharmaceutical sciences within the context of pharmacy-based disease state management. 3. Integrated Experiential Sequence: employing three strands of activity (Early, Intermediate, and Advanced Pharmacy Practice Experiences), this course sequence spans Quarters 2-12 and involves students in service learning, leadership development, and practice experiences across a range of pharmacy settings.

**Integrating Public Health Into the Pharmacy Curriculum: An Innovative Approach.** Mary L. Chavez, Texas A&M University Health Science Center; Anna Ratka, Texas A&M University Health Science Center; Rajat Sethi, Texas A&M University Health Science Center; James A. Robertson, Jr., Texas A&M University Health Science Center; Indra K. Reddy, Texas A&M University Health Science Center; Barry Bleidt, Texas A&M University Health Science Center. Public Health is defined as the science and the art of preventing disease, prolonging life and promoting physical health and efficiency.
The Texas A&M Health Science Center Irma Lerma Rangel College of Pharmacy is committed to making its graduates an accessible public health professional. As part of our first year curriculum a course, Introduction to Health Care/Public Health, is offered. This course is designed to encourage students to seek knowledge about contemporary health problems, prepare balanced and informative approaches to critically evaluate public health issues, and improve their presentation abilities. A key element of this class is the requirement to research and present a project relating to Public Health. The first cohort of students in the program used this opportunity to highlight areas of concern in South Texas. As part of their assessment, students had a public display of their projects. The local news media caught wind of these presentations and was on hand to interview the students. This poster will present the variety of chosen topics, students’ perceptions of the activity, and the public press’ perception of this activity. As a result of the College’s emphasis on Public Health, the students in the inaugural class added a special section to the Constitution they drafted for the Academy of Student Pharmacists requiring the submission of a Public Health-related article to the local press each month. A copy of the presented articles will also be included as part of this presentation.

Integrating Skills and Public Health Initiatives Early in a Pharmacy Curriculum Using Team Research Projects. Rajul A. Patel, University of the Pacific; Nancy L. DeGuire, University of the Pacific; David G. Fuentes, University of the Pacific; Eric G. Boyce, University of the Pacific. Background: Early curricular exposure to integrated team-based projects and public health issues could benefit students, strengthen classroom learning and provide accelerated socialization. Objective: Research, team-based/self-directed learning, cultural diversity, patient interviewing, information retrieval, public speaking, and statistics skills were integrated into a project targeting public health initiatives across 2 courses. Methods: Two hundred ten first-semester pharmacy students were randomly divided into 34 teams. Students developed surveys featuring public health topics from Healthy People 2010 Priority Areas. Faculty facilitated “mock IRB” approval sessions which provided teams with ongoing feedback and refinement recommendations before each team administered their survey to a predefined population. Data analysis, formal written reports, and oral presentations were presented to peers and faculty. Lastly, teams were asked to reflect on their performance and evaluate individual and collaborative efforts. Results: Teams complied with the requirements of the “mock IRB,” effectively applied basic research principles and presented their project findings. A total of 33 teams (97%) performed inferential statistical analyses on their data, with only one of the groups failing to incorporate statistical analysis into their project. Two-hundred six students (98%) reported feeling satisfied with both the results of their project and the accomplishments of their team. Conclusions: Teams applied a varied skill set including primary literature evaluation, basic research principles, statistics, public speaking and peer collaboration in effort to complete a public health research project. Pharmacy students may benefit from early exposure to collaborative research and public health initiatives. This integrated approach meets public health and other CAPE educational outcomes.

Integration of CAPE Outcomes Into a Pharmacy Practice Course through Application of Business Plan Models. Hildegard J. Berdine, Duquesne University; Monica Skomo, Duquesne University; Khalid M. Kamal, Duquesne University. Objective: To describe the integration of the 2004 CAPE Educational Outcomes into the curriculum through a new required pharmacy practice course which focuses on the development, implementation, and evaluation of clinical pharmacy services using a systematic business plan. Design: A 3-credit hour course entitled Pharmacy Practice V: Clinical Pharmacy Services and Pharmacoeconomics was offered to the third-year professional Pharm.D. students. In accordance with 2004 CAPE Educational Outcomes, which emphasizes providing population-based pharmaceutical care and systems management, the course provided students with the knowledge and skills necessary to (i) develop a business plan (ii) implement clinical pharmacy services in different practice settings and (iii) evaluate the clinical and economic outcomes of the service. Assessment: Student performance was measured using a variety of assessment tools including objective examinations, classroom participation, and a group project. The group project was evaluated by the course faculty using a rubric. In addition, students were also asked to evaluate their peers in their assigned groups. A standard evaluation form was utilized to collect students’ feedback regarding personal experience, the course content, and the instructors. Conclusion: CAPE Outcomes were successfully integrated into a new pharmacy practice course as evidenced by student performance, measured though exam scores, a group project score, class participation, peer evaluation, and standard teaching evaluations. The course provided pharmacy students with the framework necessary to develop and implement evidence-based disease management programs and to assure efficient, cost-effective utilization of pertinent resources in the provision of patient care.

Interdisciplinary Longitudinal Curriculum for Pharmacy and Medical Students. Robb W. McGorry, Northeastern Ohio Universities; Cornelis J. Van der Schyf, Northeastern Ohio Universities; Paul J. Hartung, Northeastern Ohio Universities; Loree G. Allen, Northeastern Ohio Universities; David D. Allen, Northeastern Ohio Universities; Janis J. MacKichan, Northeastern Ohio Universities; Michelle L. Cudnik, Northeastern Ohio Universities; Patrick J. Gallegos, Northeastern Ohio Universities. Newly published ACPE standards, the CAPE Educational Outcomes, and the Institute of Medicine Report have all promoted the importance of an interdisciplinary approach to public health and healthcare education. The Northeastern Ohio Universities Colleges of Pharmacy (COP) and Medicine (COM) have partnered to create a common experiential curriculum that focuses on community health. Students from both programs participate in a common experiential program, as well as discipline-specific programs, throughout the four years of the curriculum. The program starts with a three week joint course entitled "Prologue" that will focus, in part, on population health, assessment of local community agencies, and development of professional skills (e.g., communications, vital signs) that are relevant to both groups of students. Plans for the first year common experiential curriculum include visits to home-bound volunteer patients by teams of pharmacy and medical students, involvement in community-based agencies, and use of standardized patients to assess history-taking and cultural competence. The discipline-specific experiential program for pharmacy students requires exposure to as many as 6 different pharmacy environments each year, with the requirement that some of those experiences be with underserved populations. Where physically possible, pharmacy and medical students will be paired to provide interdisciplinary care at their assigned sites. This approach will be utilized in all cases during the required advanced practice experience involving underserved populations.

Kidney Early Evaluation and Prevention (KEEP) Screening Program: Public Health Opportunity for Pharmacy Students. Timothy P. Stratton, University of Minnesota; Wendy L. St. Peter, University of Minnesota; Danielle Smith, University of Minnesota;
Susan Haight, University of Minnesota; Victoria Loskinksi, University of Minnesota; Sarah Sullivan, National Kidney Foundation of Minnesota and the Dakotas. Kidney disease affects 1 in 9 Americans. The Kidney Early Evaluation and Prevention (KEEP) screening program is a free health screening program designed to raise awareness about kidney disease. One of the goals is to identify individuals at increased risk for kidney disease due to hypertension or diabetes or with first-degree relatives with those disorders or with kidney disease. Initiated through the National Kidney Foundation (NKF), screenings are carried out through state or regional NKF affiliates. The screening is an extensive 30-minute process that includes six stations: initial screening; extensive health history; height, weight and blood pressure check; blood tests for hemoglobin, blood glucose, serum creatinine, lipids, calcium, phosphorus, parathyroid hormone; urinalysis for proteinuria and albumin to creatinine ratio; and exit interview with a nephrologist or nurse practitioner. Student Pharmacists have been integral to the success of this important public health initiative in Minnesota. Since 2003, the Minnesota chapter of Kappi Psi (1st through 4th year students) has committed its services to multiple KEEP screenings each year across Minnesota. With minimal training, students are able to staff four of six stations. Those with phlebotomy skills can also draw blood samples. Since individuals at high risk for kidney disease are predominantly from minority populations and KEEP is a national screening program conducted by interprofessional volunteers, Student Pharmacist participation in these screenings meets several ACPE-mandated public health competencies. KEEP screenings could be integrated into a pharmacy curriculum as part of an introductory or advanced practice experience.

Mapping Cultural Competency in the Humanities Curriculum at Albany College of Pharmacy. Andreas Karatsolis, Albany College of Pharmacy; Kevin M. Hickey, Albany College of Pharmacy. What is “cultural competency,” and how can pharmacy curricula effectively teach and integrate this competency into their programs? How can cultural competency be measured, and what strategies might make cultural competency not merely something students “learn, return, and forget” but a living element that remains with students long after they have graduated? Employing ideas developed by both a core working group of five faculty members (Humanities Sequence Group) and a group of eleven members (all full-time faculty who teach in the three-semester “Humanities Sequence”), we have analyzed the data from surveys taken by our faculty, our second-year students (4th semester), and our fifth-year students (10th semester) to map the goals, activities, and products of ACP’s Humanities Sequence in relation to both the college’s writing requirements and Liberal Arts electives. This curricular mapping activity is part of our larger project examining how Liberal Arts courses can most effectively promote cultural competency among our students. What we are especially interested in is how to integrate the outcome of cultural competency into courses that must also teach critical thinking, subject content, oral and written communication skills, research skills, information literacy, and peer collaboration skills. The broader goal of our analysis and research is to look at how to extend and integrate the cultural competency component of Liberal Arts courses throughout our college’s pharmacy curriculum. This poster presentation focuses on Humanities courses and the activities, skills, and assignments that promote cultural competency not merely for short-term gains but in ways that constitute building blocks for further growth and progress.

Mapping Curricular Topics to Courses in Establishing the Curriculum for a New School of Pharmacy. Warren Richards, St. John Fisher College. After soliciting the input of consultants and reviewing the curricular listings of peer institutions, a proposed course list was developed for the curriculum. An academic flow diagram was developed to describe the interrelationships that exist in delivering a curriculum. The 2004 CAPE Educational Outcomes were used as a template for creating the initial program learning outcomes the curriculum would meet. A curricular pathway was developed to describe the relationships between courses in the curriculum. This pathway guides the integration of courses with each other to optimize student learning of concepts that are addressed in multiple courses. It also helps faculty recognize the need to collaborate between disciplines to facilitate student learning and the meeting of curricular outcomes. In order to ensure that all relevant topics were covered in the curriculum, the ACPE Accreditation Standards and Guidelines 2007 were reviewed. Topics listed in Appendix B were distributed to the faculty. Each was asked to identify those topics to be addressed in each of their courses. It was found that only one topic was not addressed in the pharmacy curriculum. It was addressed in the required pre-pharmacy coursework instead. As courses are approved, the faculty will create learning outcomes consistent with the accepted topic list. The AACP 2004 Cape Educational Outcomes Supplement will be used as a guide for creating the outcomes. Assessment of the curriculum will be through student surveys at the end of each semester and annual focus groups of students, faculty, and preceptors.

Mapping of Pharmacotherapy Outcomes: An Assessment-Based Strategy. Susan P. Bruce, Albany College of Pharmacy; Aimee F. Strang, Albany College of Pharmacy; Darren W. Grabe, Albany College of Pharmacy; Angela C. Dominelli, Albany College of Pharmacy. An organized, structured assessment was developed to evaluate a pharmacotherapy course sequence. The objective of this strategy was to identify opportunities for change and enhancement within the existing curriculum in response to the 2007 ACPE Curriculum Standards. The second objective was to determine if this approach could be applied to all courses in the pharmacy curriculum. Outcomes from syllabi representing the 4-course Pharmacotherapy sequence were reviewed. Outcome descriptions, achievement methods, and evaluation tools were documented. Evaluation tools (e.g. exams) were cross-referenced to outcomes. A leveling system (low, medium, high) based on Bloom’s taxonomy was applied to individual items in the evaluation tools. Course coordinators verified areas of adequate assessment, identified inconsistencies and areas requiring further evaluation. Twenty (11 professional; 9 general) outcomes were listed in the 4 syllabi. Multiple-choice exams were the primary evaluation tools used to assess outcome achievement. The outcome “interpreting and evaluating data” was most commonly assessed in course examinations. A low difficulty level was assigned to 60% of exam questions compared to 25% and 14% assigned to a medium and high level, respectively. Nearly all outcomes (85%) were either developed or assessed within the components of the course (exam, lab, recitation). Three outcomes (15%) were not assessed or developed. A structured approach to curricular outcome mapping identifies opportunities for change, enhances faculty communication and collaboration, and results in assessment-based changes to the curriculum. Future initiatives will focus on utilizing this information to enhance assessment tools and course-specific activities that ensure achievement of the stated educational outcomes.

Mapping Strategy for a Revised Doctor of Pharmacy Program Curriculum. Jane R. Mort, South Dakota State University; Thomas J. Johnson, South Dakota State University, Brian L. Kaatz, South Dakota State University. Purpose: The Curricular Outcomes for the
College of Pharmacy at South Dakota State University served as the basis for curricular decisions and management for a decade. Their recent update was a core driver for the first major curriculum revision since the beginning of the Pharm.D. program in 1994. This poster demonstrates the utilization and inter-relationships of curriculum content and outcomes, as well as competency assessments through a comprehensive mapping process utilizing an Applied Standards document. 

**Methods:** The Curriculum Committee initiated the “Applied Standards for the SDSU College of Pharmacy Curriculum” intended to map the curriculum to the curricular outcomes and national pharmacy education standards. At a retreat, the faculty was asked to refine specific sections of the document. The Curriculum Committee then made further revisions, submitted it to individual faculty members for review, and then approved the document. The revised Assessment Plan was incorporated into the final document.

**Results:** One document now maps the AACP CAPE Educational Outcomes, ACPE suggested curricular content (Appendix B ACPE Standards 2007), summary of individual course content, SDSU College of Pharmacy Curricular Outcomes, and competency assessment strategies for each course. High-stakes progression standards are also included within this document. **Conclusion:** The “Applied Standards” mapping document provides the SDSU College of Pharmacy a comprehensive document that will allow continuous review of the Pharm.D. curriculum and ensures all appropriate educational outcomes are addressed, evaluated, and met by graduates of the College.

**Measuring Student Achievement in Pharmaceutical Calculations.** Theresa A. Laurent, St. Louis College of Pharmacy; W. Thomas Smith, St. Louis College of Pharmacy. Competency in pharmaceutical calculations is a necessary underpinning in order for future pharmacists to effectively manage patient drug therapies and drug distribution. This poster presents the results and analysis from a study examining student work in an Introduction to Pharmacy Practice course at the St. Louis College of Pharmacy. The study also examines how different presentations of pharmaceutical calculation word problems influence outcomes. On the final exam, students were asked to solve multi-step problems covering aliquots and isotonicity. Students were presented with two problems for each topic: one problem provided written guidance to assist students through the process; the second problem simply asked the question but provided no guidance. Preliminary results of this study indicated significant differences between scores on guided versus unguided questions. Fifty-six percent (56%) of the students (n = 124) correctly answered all parts of the guided isotonicity problem while only 41% correctly answered the unguided problem. Even more dramatic were the results from the aliquot problems. The lab experience appeared to help students complete the guided problem, 77% correctly answered all parts. However, only 24% answered the unguided question correctly. Based on these results, it appears that most students are able to accurately complete the individual steps to solve these problems. However, students struggle with synthesizing the information on their own. More instructional time should be spent on developing problem-solving strategies so that students can solve these problems without assistance.

**Multi-level Curricular Mapping at the University of New Mexico.** John A. Peper, The University of New Mexico; Stefani D. Hines, The University of New Mexico; Karen D. Dominguez, The University of New Mexico. The College of Pharmacy at the University of New Mexico instituted systematic curricular changes for Fall 2006. A major change was the introduction of a six semester sequence of pharmaceutical care laboratories. The revised curriculum provides the opportunity to implement a new multi-level mapping process that will ensure curricular coherence and allowed us to assess achievement of competencies in an integrated lecture/laboratory format of instruction across the curriculum. Our Doctor of Pharmacy program competencies incorporate the CAPE 2004 Educational Outcomes with additional competencies unique to the College and the practice of pharmacy in New Mexico. The mapping process will designate where in the curriculum the program competencies are introduced, developed, and reinforced. Three additional steps will occur: 1) specific course objectives will be mapped to its related program competency; 2) course objectives will be prioritizing based on Bloom’s taxonomy; and 3) the expected mastery level of each objective for each course will be articulated. The application of this rigorous multi-level mapping process will help faculty refine and re-align their courses and provide clear expectations for students. The process will be developed initially for three new or recently modified first-year, first-semester courses - pharmaceutical care laboratory, Foundations of Drug Action (biochemistry), and pathophysiology. The process will then be implemented throughout the curriculum.

**Outcomes: A Basis for Curricular Revision.** Stanley S. Weber, University of Washington. In August 2004 a curricular review committee was charged with guiding the faculty in developing and implementing a professional pharmacy curriculum leading to an outstanding practitioner graduate. One result was a series of outcome statements that are clear and measurable. Two questions were asked and answered in the development of each statement: * Does it reflect what all graduates should do? * Does it reflect other sets of practice philosophies and outcomes, such as the IOM Competencies, CAPE Outcomes, and ACPE Standards. These outcomes were integrated into a guiding document containing: 1) a definition of the core provided, 2) a list of the principles forming a practice foundation, 3) a list of seven general ability-based outcomes (ABO), and 4) a list of professional ABOs modified from the CAPE outcomes. These carefully defined ABOs are currently being used to guide a revision of the core curriculum including integration, measuring terminal outcomes, and forming the basis of a curricular map. For example, a “mini-map” was implemented where each core course was classified as to whether it contributes to meeting an ABO according to definitions of 1) “Foundational,” meaning course might not directly develop it, but the ABO requires the knowledge, skills, or attitudes provided by the course, 2) “Directly Applies” meaning the course develops knowledge, skills, and attitudes that can be mapped to specific ABOs, or 3) the ABO is not developed. We have subsequently closed curricular gaps and have begun adopting the ABOs for use in student assessment.

**Practical Application of the CAPE Educational Outcomes Within the Pharmaceutical Care Course Sequence at the University at Buffalo.** Robert G. Wahler, University at Buffalo; Nicole M. Paolini, University at Buffalo. **Objectives/Intent:** The Pharmaceutical Care Course Sequence (PCCS) is a vital component of the curriculum in which pharmacy students develop the knowledge, skills, and attitudes/values of being a successful pharmacy practitioner. **Methods/Process:** Course coordinators for the PCCS used the 2004 CAPE Educational Outcomes as a foundation to introduce basic pharmaceutical care principles in an effort to eventually allow the student to inculcate pharmaceutical care knowledge, skills and attitudes/values into everyday pharmacy practice. Prior to the Fall 2006 semester the PCCS ran for four semesters beginning in the first professional year and ending in second professional year. Several deficiencies were noted by preceptors who oversaw the fourth year professional
experiential program. Two additional semesters of the PCCS were added in the third professional year to accommodate these deficiencies. Topics such as Discharge Counseling and Medication Reconciliation, MTM Review, managing a pharmacy and Pharmacist consultations were just a few areas that were added to the additional semesters in the third professional year. Results/Outcomes: We will evaluate the outcomes of this curricular addition by gathering follow-up data from the same group of preceptors. Specifically, data will be collected on the areas addressed in the new courses and if there was a perception on the part of the preceptors that students were better prepared to actively use these skills developed. Implications: By allowing our students the opportunity to learn the knowledge, skills and attitudes/values necessary to be a successful practicing pharmacist, we will have effectively used the CAPE Educational Outcomes to further the practice of pharmacy.

Public Health: Outcome Definition, Gap Analysis, and New Initiatives. Susan M. Meyer, University of Pittsburgh; Maria Yaramus, University of Pittsburgh; Sandra L. Kane-Gill, University of Pittsburgh; Sharon E. Connor, University of Pittsburgh; Teresa E. Donegan, University of Pittsburgh; Kim C. Coley, University of Pittsburgh; Denise L. Howrie, University of Pittsburgh; Gary P. Stoehr, University of Pittsburgh. As a result of the periodic revision necessary to assure the contemporary validity of the curriculum, faculty at the University of Pittsburgh School of Pharmacy defined public health as one of 13 curricular outcomes. A working group was appointed to outline the component content areas; identify the ability outcomes; map how public health was integrated across the curriculum; expose any gaps; and identify instructional and assessment strategies to facilitate further integration. The group suggested minor revisions to the outcome statement; articulated four ability outcomes; and organized related learning objectives, educational strategies, and assessment methods by outcome and year in the curriculum. Modifications were made to the first three years of the curriculum. Sessions for first-year students were modified to address health beliefs, health status, and health-impacting behaviors. Two discussion sessions and a laboratory were added in which each student gathered personal data; established a personal health record; explored personal readiness to change; and outlined a health-impacting behavior change goal. Second-year students reviewed implications of readiness-to-change stages for health promotion; explored sources of public health information; and discussed the role of pharmacist relative to the various components of public health. These additions complemented continuing activities in service learning and the development and implementation of a public health education project. Third-year courses were modified to include how pharmacoeconomic and patient-reported outcomes are integrated into public health decisions. Additionally, students explored the relationship between public health issues and prevention and treatment programs by investigating how new therapies arise from public health problems.

Redesigned Pharm.D. Curriculum Focusing on Patient Care. Muhammad J. Habib, Howard University; Joseph R. Ofosu, Howard University. Howard University School of Pharmacy is in the 3rd year of implementing its integrated curriculum focusing on patient care. This curriculum is designed not only to train pharmacist to provide total patient care but also to make them lifelong learners. The main themes of the didactic portion of the curriculum are: technology supported biomedical and pharmaceutical science courses integrated within and across disciplines; modular Integrated Therapeutics (IT) courses organized by organ systems; use of pharmaceutical care plans as part of student learning; and utilization of a variety of active learning strategies across instructional areas. Additionally, unique features of this curriculum include the use of student-centered small group learning and the integration of knowledge, skills, abilities, and attitudes. All IT courses have skill based laboratory sections which are designed to facilitate the process of team building by making the didactics “come alive” in structured case study format. The Professional Experiential Program is designed to be the culminating component of a rigorous course of learning encompassing Early Experiential and a year long Advanced Experiential Programs. This curriculum provides more structure to the Faculty-Student Mentoring Program, Portfolio Writing and the Evaluation/Assessment process. The curriculum utilizes the Individual Development and Educational Assessment (IDEA) Center as an external resource for providing objective teaching and learning data as part of its quality assessment. Initial data indicates that Early Intervention, Tutorial, and Remediation strategies that have been implemented have shown improvement in student progression.

Regional (SACS) and National (ACPE) Accreditation of Schools of Pharmacy: Can the Requirements for Reporting Programmatic Outcomes be met Concurrently? Roland A. Patry, Texas Tech University Health Sciences Center; Glenn Anderson, Texas Tech University Health Sciences Center; Arthur A. Nelson, Texas Tech University Health Sciences Center. Purpose: SACS and ACPE accreditation require separate and unique processes. The School is investigating methods of collecting program terminal outcomes data that can be applied to both accreditations processes and thus maximize resources utilization and efficiency. History: Before 2007, SACS and ACPE accreditation requirements were divergent. With the 2007 ACPE Accreditation Standards, the two accrediting bodies appear to be moving closer in their desired outcomes. This has created an opportunity for increased efficiency. Specific Issues: 1) The ACPE terminal objectives have evolved. SACS would consider these objectives as immeasurable. 2) The School has a significant number of terminal program objectives. As SACS requires multiple measures per objective, significant allocation of resources for data collection will be required. 3) The School’s assessment program is student abilities based. How these abilities tie into the new ACPE goals must be determined. Methodology: Preparation for SACS reaccreditation began October 2005. Development of the methods, objectives, and target indicators for the process started in September 2006. As part of the process, the School has undertaken the following steps: 1) Revision of graduate ability statements, 2) integration of faculty expertise into the Annual Assessment Program, and 3) a broadening of the School’s assessment program to incorporate OSCPs and rubric-based measures. Conclusions: The School’s assessment program has evolved from primarily pen-&-paper, knowledge-based to a varied assessment of knowledge, skills, and abilities. However, identification of the linkages between outcomes, competencies, abilities, and terminal goals is paramount. As these linkages are identified, the basis for “high-risk” assessment will be established.

Student Assessment of Hospitalized Patients’ Smoking and Immunization Status: An Innovative Introductory Pharmacy Practice Experience. Mary Anne Koda-Kimble, University of California at San Francisco; Robin L. Corelli, University of California at San Francisco; Michael E. Winter, University of California at San Francisco; Barbara L. Sauer, University of California at San Francisco; Sharon L. Youmans, University of California at San Francisco; Conan MacDougall, University of California at San Francisco; B. Joseph Guglielmo, University of California at San Francisco. Background: Introductory Pharmacy Practice Experiences (IPPEs) provide
opportunities for students to observe and perform patient-centered care in preparation for their Advanced Pharmacy Practice Experiences (APPEs). Students receive smoking cessation and immunization administration training in the fall quarter of their first year and can immediately apply their knowledge and skills in a patient care setting. An innovative acute care IPPE for first year students was implemented in January 2007. Description: Students are paired with faculty preceptors on the Medicine or Cardiology services spending 2 hours per week for 10 weeks. Students interview patients identified as smokers to assess their readiness to quit. For patients ready to quit, students make appropriate pharmacotherapy recommendations and provide smoking cessation counseling. Students screen inpatient records or interview patients to determine whether pneumococcal and/or influenza vaccines are indicated. The IPPE allows students to develop competencies in oral and written communication skills, cultural competence, problem solving skills, and professionalism. Upon completion of the experience students are required to write a reflection paper describing what they learned and how the experience has impacted their path to becoming a pharmacist. Results: Preliminary results of the IPPE have been positive for students and faculty. Implications: This is the first step in developing a continuum of IPPEs that will incorporate 1st, 2nd, and 3rd year students working together with 4th year APPE students and faculty preceptors. Our goal is to develop an integrated student IPPE model that can be used in a variety of settings that provide patient care.

Student Leadership Institute: Helping to Build Tomorrow’s Pharmacy Leaders. Nancy F. Fjortoft, Midwestern University – Chicago; Paula L. Giometti, Midwestern University – Chicago. Midwestern University Chicago College of Pharmacy has identified ten global curricular outcomes. Three of the outcomes are: communicate effectively, act in a professionally responsible manner and promote learning more by asking questions and seeking answers * Acquire an interest in intellectual/cultural activity * Develop skills in expressing myself orally or in writing * Learn how to find and use resources for answering questions or solving problems * Develop a clearer understanding of, and commitment to, personal values * Learn to analyze and critically evaluate ideas, arguments, and points of view * Acquire an interest in learning more by asking questions and seeking answers Outcomes: Mapping these learning objectives supplements the mapping of our educational outcomes. It identifies broad areas that re-enforce the educational outcomes and identifies areas that need enhancement. The mapping compares faculty intent and student perception which should lead to course revisions that re-enforce the college’s educational outcomes.

Ten Year Summary of Curriculum Mapping and Assessment at The University of Georgia College of Pharmacy. George E. Francisco, The University of Georgia. In 1996, the faculty adopted nine competency statements that serve as the foundation for the Doctor of Pharmacy curriculum. Terminal and enabling objectives were written for each goal statement to reflect the knowledge, skills, abilities, and attitudes needed for entry level pharmacy practice. Each objective was categorized using Bloom’s, Krathwohl’s, and Simpson’s taxonomies. The objectives were assigned to various years of the curriculum according to the “theme” of each academic year (pharmacy systems, drugs, simulated patients, patients) and their hierarchy with the three learning taxonomies. In 2003, “Professionalism” was added as a tenth curricular goal; terminal and enabling objectives were written and were also assigned to various years of the curriculum. Since the 1997-98 academic year, students have been survey to determine whether they have been taught the material associated with each objective and whether they could perform what is described in each objective. The results of these surveys have been used to assess students’ confidence in what they are learning in the curriculum and serves as one piece of information to assess curriculum effectiveness and the need for curricular change. In 2005, a Curriculum Task Force was charged with evaluating the curricular objectives and making suggestions for curriculum revision. The task force has made a few changes in the original document but has generally concluded that the objectives and mapping still provide an appropriate framework for a curriculum that prepares students for entry level pharmaceutical care.

The Urban Service Track Program: Achieving Interprofessional and Public Health Competencies in the Pharmacy Curriculum. Devra Dang, The University of Connecticut; Andrea K. Hubbard, The University of Connecticut. The Urban Service Track is an innovative interprofessional program designed to produce well-qualified health care professionals (pharmacy, medical, dental and nursing) committed to serving Connecticut’s urban core. Urban Track Scholars are a select group of students enrolled at the University of Connecticut health professional schools who participate in solving complex and challenging issues of health care in the inner city. Pharmacy students work collaboratively with other health professional students in a variety of programs, including providing patient care in free clinics at

soup kitchens and migrant farms, promoting health literacy and cultural competency, and participating in community education and outreach, quality improvement initiatives, and community-based research. In addition, the Urban Service Track Scholars will participate in conferences focusing on effective delivery of health care to underserved populations and health policy and advocacy activities. Two additional major components of the program include mentoring by faculty and community-based practitioners and a strong connection with community partners. Learning competencies were developed by all of these stakeholders. The Urban Service Track experiences are integrated within the Introductory Pharmacy Practice Experience and Advanced Pharmacy Practice Experience components of our curriculum. These enrichment programs clearly map to such CAPE Educational Outcomes as patient and population-centered care, availability of effective quality health and disease prevention services, and development of public health policy. The first cohort of these scholars will begin in the fall of 2007. Our poster will describe how the Urban Service Track was collaboratively developed by the four health professional schools and ongoing and planned activities.

University of Washington Experience: Senior Care Pharmacy Content in the Core and Geriatric Certificate Curriculums. Peggy Soule Odegard, University of Washington; Annie Y. Lam, University of Washington; Karan N. Dawson, University of Washington; Susan Lakey, University of Washington; Shelly L. Gray, University of Washington; Nanci L. Murphy, University of Washington; Joy B. Plein, University of Washington. Background: The University of Washington is nationally recognized for its leadership in geriatric pharmacy education. During the past twenty years, the Plein Certificate in Geriatrics has graduated over 200 students and practitioners. With the increasing needs of the aging population, it is imperative to assure competency of pharmacy graduates in geriatrics. Methods: A curricular mapping process was conducted for geriatrics including: 1) Review and revision of the abilities-based outcomes for the Certificate in Geriatrics and the PharmD program based on the CAPE Outcomes, MTMS consensus definition, ACPE Accreditation Standards and Guidelines, JCPP 2015, and feedback from students, alumni, faculty, and preceptors; 2) Adoption of the ASCP Geriatric Pharmacy Curriculum Guide, with slight modification, to enhance the learning outcomes of the certificate; 3) Mapping course topics, teaching extent, learning environment, and assessment measurements to outcomes; and 4) Reporting results and recommendations to the School’s Curriculum Review and Planning Committee (CRPC). Conclusion: Three curricular areas: principles of aging, pharmacists’ care for seniors; and senior care practice, management and research were identified. Competencies within these foci, with links to skill level, were endorsed. Initial results identified one primary curricular gap, the creation of a business plan, although further analyses are needed. A final report to the School’s CRPC with specific recommendations for future action is planned. Future implications: This process may serve as a model for other schools who wish to assess and then integrate, advancement geriatric course content into their core curriculum.

Use of Modified PRECEDE-PROCEED Model to Define and Measure Achievement of Terminal Performance Outcomes. David A. Gettman, University of Appalachia. Objectives: The mission of the University of Appalachia College of Pharmacy is to provide access to pharmaceutical education to the citizens of central Appalachia and to individuals committed to the needs of rural and underserved communities. To fulfill this mission, the college has used a modified PRECEDE-PROCEED Model to provide a continuous series of phases that help define and measure the achievement of terminal performance outcomes. Methods: PRECEDE-PROCEED are acronyms for the determinants of terminal performance outcomes by students. PRECEDE stands for Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation. PROCEED considers additional institutional factors that influence outcomes including Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development. The model has nine phases, the first five phases of which are diagnostic. The four remaining phases in the model are implementation and evaluation (process, impact, and outcome), with emphasis on using the latter to improve the former. Results: The model has been most helpful during Phase 4 which involved educational and organizational diagnosis. This phase focused on examining factors that shape the achievement of outcomes, and environmental factors. Outcomes were not only found to be shaped by predisposing, reinforcing, and enabling factors, but also amenable to focused change. Environmental factors were found to be influenced by certain enabling factors. Implications: The systematic planning process seeks to empower our students with understanding, motivation, and skills and active engagement in the community to provide pharmaceutical care that promotes wellness and improves health outcomes in rural and underserved communities.

Using Standardized Patient Assessment to Measure Terminal Performance Outcomes in the Context of Clinical Care. Ronald E. Ragan, The University of Kansas. The school of pharmacy at The University of Kansas, like most successful schools of pharmacy, has a long history of assessing students’ knowledge with multiple-choice or essay-style examinations. These types of assessment are appropriate for evaluating the level of acquisition of specialized knowledge but insufficient to determine if a student can apply the knowledge. These methods of testing, used alone, leave the more advanced, applied skills and outcomes un-assessed. A trend several years ago in US pharmacy education fostered the incorporation of case study-style exams to better put knowledge assessment in the context of clinical care. Case studies can simultaneously assess the acquisition and retention of knowledge and clinical competence, but lack the live, applied, interactive component, limiting their utility. To assess multiple dimensions of professional training Standardized Patient (SP) methodology can be added to knowledge assessments and case study-style exams. By introducing SP assessment in our curriculum, emphasis has been shifted to training and assessing advanced care skills before students reach advanced clerkships. This assures previously un-assessed outcomes are met before a student graduates and begins a practice career. The SP program at KU assures that students are competent in both core knowledge and applied skills by staging SP events that require students to possess specialized knowledge and demonstrate professional judgment. By standardizing the performance of our patients a reliable evaluation of competency can be provided and faculty are assured that students have the requisite skills to provide advanced care upon graduation.

Using Student Portfolios to Assess Self-Learning and Independent Learning Ability. Mary L. Chavez, Texas A&M Health Science Center; Anna Ratka, Texas A&M Health Science Center; Rajat Sethi, Texas A&M Health Science Center; James A. Robertson, Jr., Texas A&M Health Science Center; Indra K. Reddy, Texas A&M Health Science Center; Barry Bleidt, Texas A&M Health Science Center. The Student Portfolio is documentation of progress toward a student’s professional and personal goals and the aims of the Texas A&M Health Science Center College of Pharmacy. One of the College’s goals is to facilitate progress of the students towards his or her goals by providing selected purposeful experiences and requiring certain

activities for personal and professional growth. Required is the development of a Student Portfolio that will be turned in at the end of each semester to the student’s faculty advisor. The student portfolio will include required and self-generated assignments as well as personal reflection in a variety of required and optional growth areas. The process of reflection and documentation begins at Orientation with a self-analysis of personal and professional strengths and weaknesses. This self-scrutiny provides the starting point for growth and developing a personal mission statement. Portfolio development is a longitudinal process, building in complexity and depth each year. Among the objectives of the Portfolio are to make evident the student’s ability to self-learn and grow as an independent learner. This poster will present the results of two semester’s experience with the Student Portfolios as they relate to measuring the students’ achievement of two of the College’s terminal performance outcomes, self-learning and independent learning growth. A discussion on using Faculty Advisors as the focal point of this activity and specific examples of student reflection in these will be included.

Using a Curriculum Map to Track How the Professional Program Develops Students Toward Defined Outcomes. Jean T. Carter, The University of Montana; David S. Freeman, The University of Montana; Jean Pfau, The University of Montana; Genine M. Thormahlen, The University of Montana. With the new ACPE guidelines and the 2004 CAPE document, efforts to review and revise the doctor of pharmacy curriculum have begun at the Skaggs School of Pharmacy. The approach used by the Curriculum Committee focuses on a curriculum content map created several years ago to track potential voids and duplications of topics in the curriculum. At the time of its creation, the Committee planned to add teaching methods and outcomes to the map. When the 2004 CAPE outcomes were released, the Committee combined program outcomes and CAPE outcomes not already in the program outcomes into a grid that was used to get a rough estimate of how well the curriculum contributed to the development of the desired outcomes. The results of the 2006 analysis revealed that all outcomes were addressed by at least one course. To refine its evaluation of the curriculum, the Committee has updated the professional degree program outcomes to incorporate missing CAPE items and begun in depth analyses of how each course’s content and teaching methods contribute to the final outcomes. By incorporating input from faculty at all levels, an integrated top-down approach will allow the Committee to address student development in terms of both knowledge and professional outcomes as they progress through the program. As with all evaluation efforts, there are processes that work well and processes that need to work better! The Curriculum Committee members will share their experience with the evaluation process, revised program outcomes, and curriculum map via this poster.

Using a Systematic Approach to Write a New Curriculum for the Feik School of Pharmacy. Mark C. Cranberry, University of the Incarnate Word; David F. Maize, University of the Incarnate Word; Carmita A. Coleman, University of the Incarnate Word; Jeffrey T. Copeland, University of the Incarnate Word; Renee A. Bellanger, University of the Incarnate Word; Grady S. Weston, University of the Incarnate Word; Anita T. Mosley, University of the Incarnate Word; Kevin Wade Tiller, University of the Incarnate Word; Kathy D. Webster, University of the Incarnate Word; Arcelia M. Johnson, University of the Incarnate Word. The goal of the curriculum in the UIW’s Feik School of Pharmacy (FSOP) is to produce pharmacists capable of practicing in varied multilingual and multicultural settings using a sound scientific foundation, evidence-based therapeutics and managerial principles to optimize medication therapy and patient outcomes. The curriculum will instill the knowledge, skills and attitudes required to think critically, communicate effectively, lead the profession, cooperate with others, and continue to learn throughout their lives. The FSOP Curriculum Committee mapped the curriculum “from the outside in”. The process began by writing a mission statement for the curriculum. Then using the CAPE document, NABP outcomes, and Texas State Board of Pharmacy outcomes as guidelines, the general and professional outcomes of the curriculum were defined. A list of knowledge, skills and attitudes were developed to meet these outcomes and placed into affinity groups to develop a spider diagram of the curriculum. The spider diagram was used as a skeleton to build the courses. Outcomes associated with the knowledge, skills and attitudes were assigned to specific courses, and course syllabi were developed including hours, objectives, prerequisites, and general assessment criteria. The curriculum emphasizes preventive medicine and primary care for the pediatric, adult, and geriatric populations. It will also place emphasis on patient advocacy and advisement for populations that are underserved. This curriculum is designed to specifically offer a service to the local population by offering an opportunity to become conversant in medical Spanish.

INNOVATION IN TEACHING

Winners

Using Team-Based Learning as an Instructional Strategy for Teaching an Endocrine Module for Third Year Pharmacy Students Across Two Campuses. Nancy A. Letassy, The University of Oklahoma; Melissa S. Medina, The University of Oklahoma; Jeffrey S. Stroup, The University of Oklahoma; Susan E. Fugate, The University of Oklahoma; K. Roger Hornbrook, The University of Oklahoma; J. Thomas Pento, The University of Oklahoma; Gordon Sachdev, The University of Oklahoma; Mark L. Britton, The University of Oklahoma. Objectives: Replace a lecture-based format with a team-based learning (TBL) strategy in a course delivered across distance with a high student-faculty ratio in order to promote students’ active engagement in learning course content. Methods: Course lectures were transformed into 13, 3-part TBL sessions including content pre-assignments with specific learning objectives (self-directed learning), in-class (IRAT/TRAT) individual and team readiness assessment tests (accountability), team problem solving of patient cases and class discussion led by faculty facilitators (application of knowledge) for 123 students (18 teams of 6-8 students), across two campuses. Analysis of student performance included multivariate linear regression on scores from TBL activities, individual exams and team contribution evaluations to determine impact on final grade. Student performance on individual exams and final grades were compared between TBL and lecture-based strategies, since the course employed the same test format. Evaluations of all TBL sessions and the overall course were obtained. Results: IRAT and team contribution scores significantly predicted overall grades in the course (p < .001). Overall, course grade performance was improved using the TBL method compared to traditional lecture methods used previously (no failing (D/F) grades occurred). Students accepted the change in course format indicated by course evaluation results. Discussion/Implications: This course shows that students can acquire knowledge in a self-directed environment as well as apply that knowledge to common therapeutic scenarios. This is a viable active-learning instructional strategy for large student-faculty teaching ratios and distance education environments.

Innovations in Competency Education. Paul R. Lockman, Texas Tech University Health Sciences Center. Despite the drawbacks of
the lecture format and that ACPE suggests innovative teaching strategies, many pharmacy courses rely heavily on didactic lectures. To address this, we implemented a model of competency based education, first proposed in 1968, that has been shown to improve understanding and long term retention. We applied this methodology to anatomy by breaking the course into 23 module worksheets and related exams. Module worksheets were comprised of comprehensive chapter vocabulary terms and figures. Module exams in WebCT mirrored worksheets except they consisted of only a random subset of terms. Students were allowed to take the examinations as many times as they wanted; however, each subsequent exam a new random subset of the worksheet was presented. We observed a significant increase in module learning, weaker students had the same competency levels of stronger students, a high degree of self paced learning, and module completion highly correlated with lab practical scores. According to our knowledge this is the first documented use of this competency model in a pharmacy school. Previous implementation may have been limited since it requires faculty to provide student feedback and tutoring on every exam item and the development of multiple exams for one content module. Our innovation is found in the combination of competency based education with current technology that allowed us to create random module examinations with immediate feedback and tutoring on each test item.

Making a Difference: A Successful Approach to Fostering Reflective Dispositions and Career-Shaping Experiences in the Indian Health Service. Victoria F. Roche, Creighton University; Rhonda M. Jones, Creighton University; Clint E. Hinman, Chinde Comprehensive Health Care Facility; Nathalie Seoldo, Tsaille Health Center. This dossier describes the success of a 2 credit hour elective course in Native American culture, health and service-learning in stimulating awareness/appreciation of contemporary Native American life (traditions, tribal government and social and health challenges) and fostering interest in experiences and/or careers with the USPHS Indian Health Service. Students conduct background readings over a wide range of course topics, keep reflective journals, engage in discussion with speakers from nearby reservations and the Omaha urban American Indian community, research and present a Native American health issue, and spend their fall break in Chinle, AZ providing social and healthcare services to the Diné under the supervision of IHS pharmacists. Students learn about additional experiences within the IHS, including Jr. COSTEP, rotations and residencies, and reflect on discerning the Creator’s call to a professional life of service. A high percentage of enrollees have opted for additional IHS experiences and/or careers. Our experience shows that providing students with opportunities for immersion in a culture rich in tradition and values, coupled with opportunities for collaborative learning, guided reflection and focused professional services and mentoring, can result in an enhanced appreciation of Native American culture and the contemporary Native American experience, and stimulates selection of experiences and/or careers of service.

Honorable Mentions

Walking a Mile in My Shoes: Impact of Patient Empathy Modeling on Pharmacy Students Caring for Underserved Patients. Judy T. Chen, Purdue University; Devra K. Dang, The University of Connecticut. Healthcare professionals’ limited understanding of patients who face economic, cultural, or linguistic barriers can generate negative attitudes, create social distancing, and potentially adversely affect the quality of care provided to this vulnerable population. Pharmacy students completing an experiential rotation at two primary care clinics that provide healthcare for underserved patients were assigned to one of four Patient Empathy Modeling exercises for 10 days. Each student “became the patient” and participated in activities to mimic the life of an actual homeless patient, a Hispanic patient, an illiterate patient, or a hearing-impaired patient coping with multiple chronic diseases. The effectiveness of this pedagogy was evident through improvement in students’ scores on a validated measurement of empathy. Content analysis of journal entries and a final writing assignment revealed self-reflected attitude and behavioral changes. As students “became patients,” they became sensitized to the culture, concerns, and perspectives of an underserved patient living with chronic medical conditions. All students affirmed the assignment as a valuable experience that made them aware of challenges encountered by patients with chronic illnesses and psychosocial barriers to healthcare. The Patient Empathy Modeling pedagogy succeeded in reinforcing a critical concept in pharmacy students: the need to consider socioeconomic, cultural, and interpersonal differences in order to develop patient-specific recommendations and optimize drug therapy.

Patients’ Perspectives on Health, Illness, and Culture. Mary Beth O’Connell, Wayne State University. Background: To provide excellent pharmaceutical care, pharmacists need to incorporate cultural aspects and be respectful and accepting of cultural differences. As the US minority population increases, greater needs for culturally focused health care exist, especially to decrease health care disparities. Objective: Increase the cultural competency of student pharmacists early in their pharmacy curriculum through an innovative course utilizing a patient focused approach with extensive use of non-medical media and critical reflections. Methods: People from various ethnic, religious, economic, and sexual orientation cultures and/or with various chronic illnesses interact with student pharmacists during a 2 credit summer elective course. Students also watch movies, read fiction or autobiographical books, engage in bookclub discussions sharing their cultural perspectives, participate in role playing exercises focusing on culturally related medication problems, and write critical reflections on their interactions and learning. Outcomes: Most students had never participated in a bookclub but felt that learning method resulted in enhanced learning through hearing other students’ comments. The critical reflections helped students think about their own beliefs, cultural differences, and means to incorporate into pharmaceutical care. The role playing exercises and debriefings were helpful to develop cultural competency. Evaluations were very positive. The second standardized course evaluation was above college averages. Conclusions: A patient centered course with non-medical media can improve the education of student pharmacists. Students act as both learners and teachers.

Multi-Faceted Approach to Improve Learning in Pharmacokinetics. Adam M. Persky, The University of North Carolina at Chapel Hill. Learning pharmacokinetics is difficult because of students’ fear of math and because learning pharmacokinetics is like learning a new language and developing a new way to think. The innovations within pharmacokinetics have been limited to or centered around simulations of how concentration-time profiles change under different conditions. Although this is a useful exercise, we have taken different approaches to improve learning of pharmacokinetics and to view the learning experience from a holistic point of view. This document describes the development of several games, a pilot multimedia module to teach hepatic clearance, the application of reflective writing and a novel method of testing incorporating immediate feedback. In most cases, examination scores did not improve with the incorporation
of the innovations but student enjoyment did appear to increase. The lack of change in examinations scores could be a function of 1) examination scores from previous years were already high (≥90%) thus making it difficult to evaluate improvement and 2) the innovations were meant to focus on deep-learning, critical thinking and communications skills which would be better reflected in 4th year experiences rather than on pen and paper examinations. These innovations will be further developed and the courses, as a whole, will slowly migrate to focus on deep-learning, communications skills and problem solving through a more problem-based learning approach.

A Systems Approach to Scaffold Communication Skills Development. Lourdes G. Planas, The University of Oklahoma; Nelson L. Er, The University of Oklahoma. Objectives: To describe a communication skills development (CSD) system that integrates self-directed learning activities, feedback, and scaffolding strategies, and to evaluate the system’s effectiveness in a communications course. Methods: The CSD system includes two simulated patient interviews and SOAP notes. After the first interview and SOAP note, students perform self-assessments and receive feedback from faculty, patients, and peers. Students then formulate goals for improvement and deliver oral presentations regarding plans to work toward and evaluate goals. Laboratory activities that follow scaffold student learning through their participation at increasing levels of competence while gradually withdrawing support as they become more proficient. Post-laboratory reflection questions are designed to heighten students’ thinking and awareness of progress. After the second patient interview, SOAP note, and feedback process, students evaluate their goal achievement and write a summative paper. Evaluation of the CSD system consists of quantitative comparisons of patient interview and SOAP note scores, as well as a qualitative analysis of student and faculty comments. Results: Students’ communication skills used in simulated patient interviews and SOAP notes improved as evidenced by scores from multiple sources. Student and faculty comments offered additional evidence of the effectiveness of simulated patient interviews, learning strategies, and assessment methods in communication skills development. Implications: The CSD system effectively integrated various types of learning activities and feedback processes. The use of scaffolding strategies appears to enhance students’ communication skills development.

Use of Patient Simulation Mannequins to Teach Performance-Based Pharmacotherapeutics. Amy L. Seybert, University of Pittsburgh. The University of Pittsburgh School of Pharmacy curriculum integrates science and practice throughout the course of study. As the demand for practitioners continues to increase, so must innovations in education. The technology of simulation education has been established in military and aeronautic training. This approach has been adopted throughout the United States in many medical and nursing schools. The University of Pittsburgh School of Pharmacy collaborates with the Peter M. Winter Institute for Simulation, Education, and Research (WISER) to utilize simulation education in our pharmacy curriculum. Simulation education offers students the ability to visualize pharmacology and pharmacodynamics of medications, realistic physiologic parameters of diseases, bedside interactions with healthcare professionals, bioterrorism situations, and many other scenarios. This type of education offers benefits for assessment of curricular outcomes. The facilitator provides immediate feedback to students, documents all decision-making processes, varies each simulation based on individual student need, and completes all assessments without interfering with actual patient care. Some patients are not willing to allow students to obtain vital signs, discuss medication therapy, or to permit bedside education when they are acutely ill. Also, it can be difficult to find patients with specific disease states in order to educate our students with visualization of certain physiologic situations. Patient simulation education offers an opportunity to address all of these concerns, as well as to advance our profession as a whole.

NEW INVESTIGATORS PROGRAM FOR PHARMACY FACULTY

Continued Testing and Validation of an Instrument to Assess Behavioral Professionalism of Pharmacy Students. Dana P. Hammer, University of Washington; Terrence R. Jackson, The University of Arizona; Rachel S. Schreffler, University of Washington. Objective: The purpose of this project is to continue validating an observation-based instrument developed and tested to assess pharmacy students’ behavioral aspects of professionalism. Methods: Phase 1 tested a classroom-version of a 25-item instrument originally designed for use during experiential learning. Phase 2 tested a 10-item version of the original instrument in clerkship rotations. 1st phase data were analyzed using Rasch methods; 2nd phase data were analyzed using factor analysis. Results: Phase 1: Faculty from 15 schools completed observations of 996 students using the classroom instrument. Rasch analysis indicated a person reliability of 0.92, that most items functioned unidimensionally, and that the rating scale measured interval data. Three items could be revised or deleted to improve psychometric properties. Phase 2: Preceptors from 16 schools completed observations of 452 students. Results indicated an instrument reliability of 0.931. Deletion of one item would increase reliability to 0.934. Items seem to represent 1 factor. Implications: Both versions of the instrument demonstrated favorable psychometric properties. Although further testing is needed to continue the validation process of both versions, data thus far indicate that each could serve as valid and reliable measures of behavioral aspects of students’ professionalism. The measures should be used with others to throughout the educational process to get a more comprehensive measure of students’ professional development.

Evaluating Comprehension of Written Pharmacy Materials Using the Cloze Procedure in an Elderly Sample: Interim Results. Michael J. Miller, Drake University; Jane E. DeWitt, Drake University; Erin M. McCleary, Drake University; Kelly J. O’Keefe, Drake University. Objective: Reading comprehension of a pharmacy-relevant educational pamphlet was evaluated in a community-dwelling, well-elderly sample. Methods: The cloze procedure was applied to an educational pamphlet describing safe medication practices to create the pharmacy-relevant literacy assessment (PhLAT). Community-dwelling, well-elderly subjects recruited from local senior centers were asked to complete a background interview, the prose component of the Short Test of Functional Health Literacy in Adults (S-TOFHLA) and the PhLAT. Psychometric properties of the S-TOFHLA and PhLAT were described and the association between S-TOFHLA and PhLAT performance was assessed. Results: To date, 42 subjects have been enrolled. The sample mean (sd) age is 74.4 (5.7) years. Subjects are predominantly white (97.6%), female (64.3%), and the equivalent of a high school graduate or higher (100%). Mean score on the S-TOFHLA is 90.9% and 52% on the PhLAT. Internal consistencies of the S-TOFHLA and the PhLAT are 0.83 and 0.78, respectively. S-TOFHLA and PhLAT scores are moderately correlated (r = 0.53, p = 0.0004). Although the S-TOFHLA placed 97.6% of subjects in the adequate functional health literacy (FHL) category, 63.4% of those subjects would be expected to need supplemental teaching.
and 7.3% would not understand the educational pamphlet as demonstrated by performance on the PhLAT. **Implications:** A large proportion of elderly patients may require supplemental health communication efforts despite demonstrating adequate FHL.

**Sustainability of In-house Immunization Services.** Salisa Westrick, Auburn University; Michelle L. Breland, Auburn University. **Objectives:** Little is known about the impact of organizational factors on sustainability of pharmacy-based in-house immunization services. Organizational Structure Perspective was used as a framework to guide this study. **Objectives:** To 1) identify stages of pharmacy involvement in in-house immunization services, 2) describe the level of sustainability of in-house immunization services, and 3) analyze how capacity-building factors predict sustainability of in-house immunization services. **Methods:** Self-administered mail survey was used to gather data from key informants of 294 randomly-selected community pharmacies in Washington State during December 2006-February 2007. **Results:** A total of 151 questionnaires were completed, resulting in response rate of 51.4%. More than half of participating pharmacies (54.8%) reported their involvement in in-house immunization services. About 10% expressed their interest in providing in-house immunization services in the future. Among pharmacies that have provided in-house immunization services, on the scale of 1-5, the level of sustainability of immunization services ranged from 1.50 to 5.0, with a mean of 3.8. Results further suggested that Organizational Structure Perspective predicted the sustainability of in-house immunization services. Among the three independent variables examined (i.e., champion effectiveness, employee participation, and compatibility of in-house immunization services), compatibility was a significant predictor of sustainability of in-house services. **Implications:** Potential strategies for facilitating the adoption of immunization delivery services can be developed using the study results as guidance. Further research is still needed to increase understanding of sustainability and abandonment of this important practice.