Learning Outcome Assessment Minigrants, 2011

Author: Loudon  Department/Program: Pharmacy/Chemistry

The plan is to develop an assessment examination that contains both relevant items from the American Chemical Society's Division of Chemical Education Examination Institute's nationally normed general chemistry exam, as well as questions that probe the relevant HMMI/SFFP competencies. This examination will be given to student volunteers from CHEM 109 near the end of the Fall semester and student volunteers completing the CHEM 115-116 series, also near the end of the Fall semester. We can, if desired, test students in the Fall 2011 semester of CHEM 255 (Organic Chemistry) who had completed CHEM 116 the previous Spring (i.e., the current semester) or Summer. As an incentive to ensure broad participation and serious student effort, a small amount of extra credit in each course proportional to test achievement level will be offered. The fact that CHEM 115-116 students may not be competent in all of the HHMI/SFFP outcomes does NOT place any of the CHEM 115-116 students at a selective disadvantage relative to each other. Furthermore, the CHEM 115-116 students and the CHEM 109 students will be tested in different courses; consequently, the two cohorts will not be competing for extra-credit points. The longitudinal component is part of measuring the long-term success of students. Prof. Loudon has, or has access to, over 10 years of grade distribution data in MCMP 204-205. We plan to retrieve grade distribution data for the CHEM 115-116 course in those same years to map student performance longitudinally. The Spring 2011 cohort of MCMP 204 students and Fall 2012 cohort of MCMP 205 students have, or will have, taken CHEM 109 to enter MCMP 204-205. Their performance will be compared to historic data in order gauge the success of the new prepharmacy curriculum. This comparison can be extended to the Spring 2012 cohort of MCMP 204 students for a broader sample population, if desired, although this is just beyond the end of the project period. This type of assessment will also allow us to determine whether CHEM 109 is preparing students to meet the relevant HHMI/SFFP competencies. An important part of the HHMI Experiment Grant program this assessment may suggest important incremental changes to CHEM 109 that can be carried out and assessed in future ears.

Author: Sieving  Department/Program: Biomedical Engineering

We plan to revise the sequence of 3 required 1-credit courses in the students sophomore, junior, and senior years (BME29000, 39000, and 49000) to address and build many of the Engineer of 2020 skills through active learning modules. The structure of the current sophomore-level Frontiers in Biomedical Engineering course will evolve from a standard lecture format to a studio style active-learning experience. The establishment of this format is not to dramatically change the course content, but to provide a learning environment that will facilitate student mastery of the learning outcomes. We hypothesize that the facilitated peer- and self-assessment component of in-class activities will be a useful tool in furthering student understanding, as well as, building critical assessment skills through annotated instructional rubrics. Should the integrated use of facilitated peer and self-assessment prove to be beneficial, we will implement the strategy in the junior and senior core courses that have complementary learning outcomes to address other key engineering and professional skills.
Author: Iten  Department/Program: Biology

Our assessment project is to continue improving the academic performance of students in large-gateway STEM classes using the LON-CAPA assessment system. The Department of Biological Sciences IT staff installed and maintains LON-CAPA at Purdue (http://oncapa.purdue.edu), and classes began using LON-CAPA this academic year thanks to our 2010 Learning Outcomes Assessment grant. This year (Fall '10 and Spring '11), 12 classes (taught by two different departments) and > 2,000 students have used or are currently using LONCAPA's assessment tools. It's important to point out that this year an additional large-enrollment class started using LON-CAPA's assessment tools each semester (BIOL 12100, fall 2010; BIOL 11000, spring 2011). Right now, we know that two more large-enrollment gateway biology labs plan to use LON-CAPA assessments next year (BIOL 23200 and BIOL 24200). It's worth noting that all classes at Purdue that adopted LON-CAPA assessment tools continue to use them, and find that they improve their students’ academic performance. This year we plan to work with ITaP to "connect" the LON-CAPA grade book to the Blackboard grade book so we don't have to manually download points from LON-CAPA that then get uploaded into a class Blackboard grade book. This "connection" will entail our setting up a secure database that's scripted to download LON-CAPA question/problem points that get formatted for upload into the Blackboard grade book. We need ITaP to set up Blackboard so LON-CAPA points can then be uploaded from this database. Also, we are waiting for the university data steward (Dan Whiteley) to get the registrar's permission so we can have a seamless transfer of class roster information to LON-CAPA. Right now, we utilize a time-consuming circuitous scheme to keep class rosters up-to-date in LON-CAPA.

Author: Shoffner  Department/Program: English Education

This project seeks to support student learning of the professional dispositions required of secondary English classroom teachers, as defined by the College of Education's Dispositions for Candidates and the NCTE/NCATE Standards for the Initial Preparation of Teachers of Secondary Language Arts. These desired professional dispositions include readiness to interact knowledgeably with students, parents and colleagues; the ability to engage in professional leadership and collaboration; and a willingness to engage in ongoing professional development as an educator. A program self-study conducted in accordance with the recent NCATE review determined a need for improved identification of and intervention with students exhibiting dispositional deficiencies earlier in the program. To better assess the dispositions commonly deficient in students, the English Education faculty proposes to conduct focus groups of (a) cooperating English teachers and (b) university student teaching supervisors since both groups observe, assess and interact with English Education students in the professional context of the secondary English classroom. Data from these focus groups will inform the English Education faculty's efforts to identify and address common dispositional deficiencies exhibited by students before students enter the classroom during student teaching.

Author: Plake  Department/Program: Pharmacy

It is estimated that by 2030 nearly 22 percent of the United States (U.S.) population will be ages 65 or older, increasing from 12.9 percent in 2009. Pharmacists and nurses must be well-
prepared to address the health-related needs of the growing population of older adults due to interactions on a daily basis. However, it may be difficult for students to understand and empathize with older adults, as they may not yet have experienced aging-related challenges, such as disability and disease. The purpose of this project is to familiarize pharmacy and nursing students with: 1) disabilities commonly found in older adults and 2) the process of seeking healthcare in the treatment of a chronic illness. Furthermore, additional goals are to improve pharmacy and nursing students' perceptions of and attitudes toward older adults as well as perceptions regarding interprofessional collaboration. Pharmacy students in PHRM 302 and nursing students in NUR 217 will participate in an interprofessional experience. Students will role-play older adults and complete an aging simulation game (The Geriatric Medication Game) designed to mimic the healthcare system. Changes in student empathy and attitudes towards patients will be measured pre- and post-activity using the Jefferson Scale of Physician Empathy. The remaining learning outcomes (learning about the challenges older adults face, the healthcare system, and ways to assist older adults) will be measured with a qualitative reflection administered post-activity. The qualitative questionnaire also will include questions pertaining to the interprofessional experience.

Authors: Schellhase and Miller  
Department/Program: Pharmacy Practice

The purpose of this project is to assess student learning in the elective course CLPH 457 (Pharmaceutical Care in Developing Countries). The goals of this project are:

- Assess student readiness for CLPH 889 (Pharmacy Kenya Program Clerkship)
- Evaluate student information retention at the end of the course.
- Perform quality assurance assessments of the material being taught in CLPH 457.

To accomplish these goals, students will take the Pharmacy Practice in Kenya Assessment Tool at the start and completion of the course. In addition, they will complete the Tool upon return from the CLPH 889 experience. Focus groups will be conducted at the end of the CLPH 889 experience to assess the relevance of the material taught in CLPH 457 to student experiences during CLPH 889. The Kenya Experience Survey Tool will be used to assess feedback provided during the focus groups.

Author: Hannon  
Department/Program: Veterinary Medicine

The purpose of this project is to analyze the impact of an innovative learning methodology on the acquisition and retention of critical anatomical knowledge in veterinary students. I have created a web-based series of veterinary anatomy modules. These modules contain a descriptive narrative component and three self-guided quizzes. Rather than just presenting questions in a text format, the quizzes utilize a graphics interface that allows students to interact with anatomical images on the computer monitor. The inclusion of these quizzes in the modules is designed to require the students to perform memory retrieval by recalling anatomical information. According to Dr. Jeffrey Karpicke, "Learning is about retrieving. So it is important to make retrieval practice an integral part of the learning process" (1,2). The overall objective of these modules is to improve student mastery of veterinary anatomy by providing anatomical information in a memory retrieval format.
The module under investigation for this assessment project is focused on skeletal muscles of the front limb. The objective of this module is that upon completion, students should be able to identify (by name) the skeletal muscles of the front limb and know where they are attached to the skeleton. Knowing attachment points on the skeleton allows students to decipher muscle function. This module contains three separate, distinct quizzes that are designed to allow the student to attain these two objectives. While the information being retrieved in the quizzes is redundant, each quiz is unique in its questioning approach. For example, one quiz examines skeletal muscle identification by showing muscle attachment points and prompting students to enter the correct name of the muscle. Another quiz shows each individual muscle as an isolated image, and prompts students to identify the muscle name and attachment points. These two quizzes are designed to help the students master muscle name and attachments. The third quiz shows all muscles of the front limb, presented in layers that begin on the outside of the limb and pass in towards the middle of the limb. Students are required to identify muscles in the images presented as they pass through these layers from the outside to the inside of the limb. This quiz is designed to master the names of, and relative locations of, muscles of the front limb. The reason for including three different quizzes in this module was to improve the mastery of content by: 1) requiring information retrieval from questions that ask muscle names and attachments from different perspectives; and 2) maintaining student interest. The purpose of this assessment project is to determine which, if any, of the quizzes in the module help the student master anatomical content. I hypothesize that the inclusion of three quizzes in an interactive anatomy module will lead to better learning, application, and retention of anatomical knowledge than inclusion of one or no quizzes.