

STUDENT OUTCOMES ASSESSMENT: CASE STUDY

Medical Laboratory Science Program,

Department of Animal, Nutritional, and Medical Laboratory Sciences

Background

The Medical Laboratory Science (MLS) Program at UNH was established in 1954 and offers a professional B.S. degree in two tracks, the MLS-Clinical and MLS-Research. Students in the MLS-Clinical Track study on campus for seven semesters and complete a six month senior internship at a clinical affiliate including Mary Hitchcock Memorial Hospital at Dartmouth College, the Maine Medical Center, Children's Hospital in Boston, and PathLab, a private health care company. Students in the MLS-Research Track do not participate in a clinical internship, but remain on campus to complete courses related to biotechnology research. The MLS program at UNH represents the only accredited 4-year program in New Hampshire and Maine, and annual enrollment has averaged about 50 students for the past five years.

Graduates of the MLS Program enter health care professional careers in analytical biomedicine and perform/supervise medical laboratory testing to provide information critical in the diagnosis, treatment, and management of diseases. The MLS Program is subject to periodic accreditation review by the National Accrediting Agency for Clinical Laboratory Sciences. Academic standards and expectations associated with accreditation, and the inherent professional concern of faculty and clinical professionals in health care, have led to the evolution and use of a multi-layered approach of student outcomes assessment in the MLS Program.

Program and Assessment

The multi-layered use of student outcomes assessment is best described as an effective temporal approach that begins with entering students and continues throughout their career. Assessment techniques used continuously throughout the academic and professional career include individual student advising by faculty, direct observation of student performance during laboratories, use of capstone courses to tie academics to the professional career, an external clinical internship, certification testing, and periodic alumni surveys.

Advising

Students enter the major without declaring an academic track. During individual advising and discussion sessions, faculty assess student progress, potential, and interest to guide them toward their respective academic track. Because the academic standards of the MLS-Clinical Track require that students have a 2.5 GPA by the end of their junior year and receive a C or better in all MLS courses, certain students are placed in the categorical option and focus on one area for the clinical internship. Research track students must meet the B.S. requirements of UNH without the internship. It is believed that this advising process helps explain the low, annual attrition rate of <5%, as well as the overall professional success of alumni.

Student performance

Analytical biomedicine requires the use of specialized laboratory techniques and skills. Mastery of such is essential, and student performance is evaluated directly by faculty. For example, in MLS 652 (Clinical Hematology) students must master techniques in diagnosis of blood diseases and blood coagulation testing. Mastery of these techniques is necessary to pass the laboratory portion of the course, and essentially it is a prerequisite of the clinical internship.

Capstone course

Capstone courses that use a case studies approach are used in both academic tracks. The capstone course (e.g., MLS 602, Medical Laboratory Seminar) exposes students to practical, professional cases with typical medical laboratory data. Student response is both written and oral, and students are forced to assimilate and apply their academic knowledge in a professional interpretation. The capstone course is ideal to help prepare students for their clinical internship that involves the collection, interpretation, and assessment of actual hospital/laboratory data with clinical professionals. Interestingly, expansion of capstone course offerings and credit hours was a result of alumni surveys and student evaluations.

Clinical internship

The 24-26 week clinical internship is the culmination of the MLS-Clinical Track. It involves a personal interview with a clinical affiliate who assesses the maturity, skills, professional understanding, potential, and confidence of students; acceptance is dependent upon this interview and grading is external by the affiliate. While interning, students perform an individual research project such as a hospital case study or evaluation of a specific laboratory technique (e.g., one student studied antibody titer levels associated with a Lyme disease vaccine), that concludes with a public presentation. Monthly site visits and evaluations are performed by UNH faculty. At the conclusion of the internship, a comprehensive examination is administered that helps identify weak areas of individual students. Identification of any weakness is ideal to help students prepare for their certification exam. The B.S. degree in the MLS-Clinical Track is awarded upon the completion of the clinical internship.

Certification exam

Students are eligible to take either the American Society of Clinical Pathologists or the National Certification Agency certification examinations after receiving their B.S.

degree. The overall passing rate of UNH students in 1994-1996 was 89% versus 80% nationally; 87% of UNH students passed on their first attempt. These statistics indicate that the MLS Program has prepared students effectively to enter the MLS profession.

Alumni survey

The MLS Program conducts periodic surveys (5-7 years) of all alumni to meet accreditation requirements. The survey gathers information about career path, specific employment, certification, and evaluation of the UNH Program ([Appendix I](#)). The most recent survey indicated that 77% of alumni were employed in the medical technology profession, and that the major-required courses were rated as good-excellent.

However, more importantly, alumni responses have led to specific change/direction in curricular requirements, course structure, a faculty search, and program evaluation. For example, the math requirement was changed from Finite Mathematics (MATH 420) to Biostatistics (BIO 528) or Calculus (MATH 424B). The surveys have also indicated the importance and value of the case study approach used in the capstone course, which led to expanded credit hours (2 to 4) and similar course offerings. Recently, alumni and the accrediting agency identified the need for student exposure to molecular diagnostics, and a faculty hire for this expertise is underway. Finally, survey responses, representation of UNH alumni in the region, and accreditation concerns led to the establishment in 2001 of a MLS Advisory Committee composed of external professionals, students, and UNH faculty. The Committee meets quarterly and will serve to guide and assist the Program within and outside UNH. For example, a cooperative program has already been initiated to assist students graduating with a 2-year Medical Laboratory Technician (MLT) degree to enter the 4-year MLS Program at UNH.

Summary

Arguably the MLS program enjoys a high level of academic accomplishment as reflected by the professional success of their alumni. This is obviously related, in part, to their temporal and multi-layered use of student outcomes assessment. The benefit of using student outcomes assessment is reflected at the student, program, and professional levels. Specific examples include intensive faculty advising and assessment to guide student choice of academic tracks, capstone courses and external internships to link academics and professional experience, and alumni surveys and an integrated program advising committee to guide the structure, development, and presence of the MLS Program. This successful approach could serve as an excellent template for similar academic programs offering professional-related degrees.

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