Master of Science in Pathologists' Assistant Studies: A Unique Graduate Opportunity for Clinical Laboratory Scientists

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Various graduate opportunities exist for clinical laboratory scientists. One such opportunity perhaps underutilized is a Master of Science Degree in Pathologists' Assistant Studies. This poster presentation will highlight the Pathologists' Assistant profession by providing a background and current and evolving scopes of practice in surgical and autopsy pathology. General graduate admission requirements will be discussed along with curriculum plans and listing of accredited institutions. National employment and salary trends will also be discussed. Observers will be left with a general overview of the profession, requirements and scope of practice. Contact information will also be provided to help individuals find additional information if they are interested in pursuing graduate studies as a Pathologists' Assistant.

1. Which of the following is correct regarding Pathologists' Assistants?
    a. They spend the majority of their time conducting autopsies.
    b. They spend the majority of their time grossing surgical specimens.
    c. They make microscopic diagnoses.
    d. They practice in clinical pathology.

2. Pathologists Assistants:
    a. Are required to have a Master's degree to practice clinically.
    b. Only work in large teaching hospitals.
    c. Are limited to positions only in the U.S.
    d. Are highly trained physician extenders who work under the general supervision of a pathologist.

Partnerships for Program Enhancements – Inter-Professional Simulation Collaboration

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Inter-professional collaboration is a key to quality medical care. Clinical laboratorians network with physicians, nurses, and other allied health professionals every day. An issue in a college setting is how to incorporate this type of collaboration within the on-campus learning environment. Three years ago, the Howard Community College's Medical Laboratory Technician program began a partnership with the Nursing program to produce a quality simulated collaborative experience for students. Yearly, the Nursing program conducts at least 26 SIM exercises, distributed among 160 students, during their Medical Surgical Nursing course. Each of the 16 MLT students participates in at least one exercise per year. Using 5 separate case study scenarios (i.e.: blood transfusion, pneumonia, asthma, stroke, and pancreatitis) supplied by the Evolve Elsevier system, along with a Laerdal 3G SimMan mannequin and a mock electronic medical record system, MLT students gain experience in the fundamental aspects of medical teamwork. MLT faculty presents a review session prior to the SIM experience, so that students have the opportunity to practice expected skills (i.e.: phlebotomy, calling results). The nursing faculty-facilitated videotaped SIM exercise requires each MLT and nursing student to review objectives, the case study, patient care plan, lab results, as well as answer a multiple-choice and short-answer questionnaire based on the handouts. Each MLT and nursing student spends at least 3 SIM hours and participates in a debriefing and evaluation of the learned concepts that occurred during the SIM exercise. The primary critical focus of the instructors is to encourage and instill professional communication skills and teamwork. Typical results from MLT and Nursing student surveys and faculty reports show the following results: the scenarios used during simulation were realistic and applicable to theory and nursing practice – 92% agree, 8% disagree or NA; simulation experiences helped me achieve course objectives – 81% agree, 19% disagree or NA; participation in simulation increased my level of clinical competence – 76% agree, 23% disagree or NA. MLT students have expressed that not only did they enjoy the experiences but also felt that it better prepared them for their clinical internships.

a. What is the sequence of activities utilized to complete the SIM exercise?
   A. Skill practice, case study review, role-play, debrief
   B. Role-play, skill practice, debrief, case study review
   C. Case study review, debrief, skill practice, role-play
   D. Debrief, role-play, case study, skill practice

b. Which of the following activities, associated with the SIM exercise, did both faculty and students agree was most valuable?
   A. Applied Skill Practice
   B. Questionnaire
   C. Debriefing
   D. Using the EMR

The Effect of Learning by Doing in the Instrumentation Course at Pontifical Catholic University of Puerto Rico

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Learning by doing has been used extensively in teaching science courses. It has proven to be an invaluable tool in helping students learn even intricate concepts. Our program has applied this teaching strategy in the Instrumentation course for the past six years. The students were divided into groups. Each group selected an instrument or technique they wanted to demonstrate. They had to prepare a model of their instrument using common arts and crafts materials. Each group had twenty minutes to present their prototype, its accompanying brochure, and make a sales pitch to the rest of the class. Since the students have always been very creative and so motivated by this activity, this year we wanted to determine quantitatively, if it was a valuable tool for learning. The professor gave the lectures as usual. After all the topics were discussed, a pretest was administered. A week later, the students made their presentations. A posttest was administered a week following the presentations. The average of the posttest scores showed an 11% increase over the average of the pretest scores. The results are very encouraging and it is our intention to keep doing this activity and gathering more data. We are also planning this kind of strategy in other courses with the intention of identifying which activities yield a higher improvement in the students' performance.

1. Which of the following instruments was selected to be presented by the students?

    a. Atomic emission photometer
    b. Flame photometer
    c. HPLC
    d. ISE

2. Which of the following information was NOT required in the prototype brochure?

    a. Instrument's limitations
    b. Diagram
    c. Company's Mission statement
    d. Company's email address

Prevention of Digital Cheating with Respondus Monitor

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Problem: The number of online applicants has increased greatly with an average of 20 students enrolled in the UAMS online MLS program. A challenge with distance education is finding testing sites in rural areas that do not charge for proctoring exams. A secondary issue with testing is prevention of digital cheating. How can instructors prove that students are not using outside resources while taking exams online? **Method:** The faculty initiated a pilot study using an online testing program called Respondus Monitor (RM) into the microbiology and immunohematology online courses. RM eliminates the need for test proctors and allows students to take exams at home while being recorded with a webcam. The RM software completes a series of checks prior and during the examination process to ensure testing security. This includes identification verification, environmental checks, and suspicious behavior flagging. **Results:** The faculty completed a data comparison for the two courses. Exam scores from students using RM were compared to students completing exams at proctored testing sites. After five lecture exams were completed, the average grade for the students taking exams at proctored testing sites was 75.17% for microbiology and 81.30% for immunohematology. The average grade for students taking exams using RM was 75.94% for microbiology and 81.77% for immunohematology. **Conclusion:** With less than 1% difference among average grades between the testing groups, this suggests that RM is successful in preventing digital cheating. Based on the data collected and the positive feedback from the RM Survey, the faculty will continue utilizing the exam software.

1. What was the percent difference in average grades between the Respondus Monitor and Proctored groups?
    a. Greater than 10% difference
    b. 5% difference
    c. Less than 1% difference
    d. No difference at all

2. Which function(s) of the Respondus Monitor software prevent cheating during online exams?
    a. Environmental checks
    b. Identification verification
    c. Suspicious behavior flagging
    d. All of the above

Development and Implementation of a Simulated Laboratory Information System to Enhance Student Critical Thinking Skills and Laboratory Operations

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The College of Southern Maryland's Medical Laboratory Technology (MLT) students were not experiencing laboratory operations using a Laboratory Information System, LIS, until clinical rotations in the second year of the program. Consequently, first year students lacked foundational skills including troubleshooting, investigating specimen quality assurance issues, and inter-professional communication. A web-based, real-time, free, and trackable solution was developed to equip first year MLT students with the practical knowledge and experience of basic laboratory operations. While ~~the~~ other solutions were initially explored, the MLT program is currently piloting a simulated laboratory information system using Google Docs ~~in~~. Laboratory tests orders, specimen location and status, and patient results are all documented in Excel spreadsheets housed in a digital environment only accessible to those with appropriate permissions. Permissions and original documents are maintained by the MLT Program Coordinator. Laboratory policies and documents are also available in the simulated LIS for access by MLT students, faculty, and other health programs during inter-professional simulations. The initial perception of MLT students and faculty supports an increase in critical thinking skills, inter-professional communication, and laboratory operations. Data collection through online survey will be completed at the end of the first year of implementation. Future applications include utilization of the Google Docs LIS in annual inter-professional simulations and all MLT lab courses starting in spring of 2017.

1. What criteria did the MLT Program Coordinator use to select Google Docs as the platform for the simulated Laboratory Information System (LIS)?
    a. The low cost
    b. Information can be viewed and modified in real-time
    c. Activity can be tracked for Program Outcomes
    d. All of the above are true

2. What processes does the simulated LIS track?
    a. Test orders, specimen location, test results, and turn-around-time (TAT)
    b. Individual user activity, test orders, and test results
    c. Only MLT student activity
    d. Quality Assurance investigation information, individual user activity, and turn-around-time (TAT)

Transition of a Hospital Based to a University Based MLS Program

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This project was undertaken to assess the changes made in a medical laboratory science program as it transitioned from hospital based to university based. The University offered this major for many years, but used three different NAACLS accredited hospital based programs for the clinical courses and rotation experience. Some of the changes implemented include the creation of syllabi for all the didactic courses which included the clinical rotations hours and requirements for completion. These courses were divided into fall and spring semesters giving the students two clinical rotations through most areas of the clinical laboratory. The total number of credits for the senior year increased by 2 credits allowing for the summer course. Distribution of credits among courses for the fall and spring semesters were more equally distributed to reflect the complexities of each laboratory area. The faculty from one of the hospital based programs was incorporated into the University as adjunct faculty as all had credentials that fulfilled the University's requirements. The biggest change was the creation of an intensive summer course prior to students' beginning their clinical rotations. Our University's sequence is a 3 + 1 program, therefore, students have no clinical courses prior to beginning their senior year. This summer course contains basic lectures in all areas of the clinical laboratory. In each area, manual procedures are introduced during the laboratory portion of this course. This course gives the students a basic introduction to laboratory medicine and a foundation to build on as they begin their rotations in the clinical year. All of these changes helped to increase the pass rate on the ASCP MLS certification exam.

1. What was the biggest change undertaken when becoming a university based program?

    a. Addition of faculty
    b. Introduction of a summer session
    c. Rotations begun in the fall
    d. Change in program sponsorship

2. How are course credits distributed?

    a. Fall and spring semesters
    b. Year -long courses
    c. Separate grades for rotations
    d. All courses have equal credit

Interprofessional Education for Clinical Laboratory Science and Physician Assistant Students Using Point of Care Testing

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Interprofessional Education (IPE) was developed to improve patient care, reduce medical errors and increase the recognition of health-care professions across the health-care spectrum. An IPE course was developed for Physician Assistant (PA) and Clinical Laboratory Science (CLS) students (n=55 and 12, respectively) at Marquette University focusing on four competency domains: (1) Values/Ethics for Interprofessional Practice, (2) Roles and Responsibilities, (3) Interprofessional Communication, and (4) Teams and Teamwork. The IPE module allowed the professional students to work in real time, face-to-face and not by traditional IPE on-line discussion. Introductions and discussion of their respective professions (domains 2,3) was performed by the students in the initial meeting. Following this, time was spent in a laboratory setting as CLS students demonstrated Point of Care Testing (POCT) instruments to the PA students. All students performed testing and analysis correlating with the assigned case studies (domains 3,4). Students then discussed the cases with an emphasis for PA students to describe patient presentation and CLS students explaining significance of testing and results (domains 1,2,3,4). A student satisfaction survey was given pre and post IPE. The results (agreed or strongly agreed) showed promising scores in four main areas: promote interdisciplinary communication (77%); understanding their role in IPE (80%); case studies selected were relevant to all students (67%); IPE module was well organized (43%). The practice of IPE will benefit the students as they become a valuable part of the health-care team.

1. Some of the purposes of IPE include:
    a. Improve patient care
    b. Reduce medical errors
    c. Increase recognition of health care professions
    d. All of the above

2. A competency domain that IPE that was focused on in this study:
    a. Interprofessional Communication
    b. Learning laboratory instrumentation
    c. Performing laboratory testing and patient analysis
    d. Completion of surveys about IPE

Paving the Path for Student Success – It Is Not All About the Students!

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Academic success is a term that is often used to indicate student's ability to succeed in an academic environment and is primarily considered the product of students' dedication and commitment to their academic responsibilities. However, the faculties at California State University Dominguez Hills Clinical Laboratory Sciences Program have noticed a growing number of students, who despite of taking their academic responsibilities seriously are yet unable to graduate within the expected 4 years. California State University Dominguez Hills Clinical Laboratory Sciences is accredited by National Accrediting Agency for Clinical Laboratory Sciences and admits both undergraduate and post-baccalaureate candidates for training as Clinical Laboratory Scientists for careers in healthcare or research. Despite the great success in graduating well qualified candidates, there has been a trend in which a larger portion of students spend more than expected time to complete the program requirements. This phenomenon prompted the faculty to investigate the likely causes for lengthy graduation rate. Two student surveys were administered; the first survey was an online questionnaire that was emailed to all part-time and full-time Clinical Sciences Students who had declared their major as Clinical Laboratory Sciences (n=220) in spring 2015, while the second survey was only submitted in person to the students who had successfully entered the clinical internship program (n=43) during the same year with the main goal being to establish the strengths and weaknesses of the program from the students' perspective who are about to complete the program requirement and earn their certification. The rate of response for the first survey was 27.7%, while the second survey response rate was 100%. The analysis revealed a number of causes for prolonged rate of graduation; however by far, the findings suggest the primary cause to be challenges associated with registration in required courses due to personal schedule conflicts and/or intense competition for available seats.

1. Which of the following is the key for student success at CSUDH CLS program is:
    a. Access to financial aid
    b. More diverse course delivery
    c. Application of new technology
    d. All of the above
2. The main obstacle for CSUDH CLS students' path towards graduation is:
    a. Difficult course curriculum
    b. Lack of trained faculty
    c. Advising issues
    d. Difficulties with course schedule and class registration

Teaching Clinical Laboratory Science As Part of a Science, Technology, Engineering, Mathematics and Health Program to Blind and Vision-Impaired Students

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The Virginia Commonwealth University School of Allied Health Professions collaborated with the Virginia Rehabilitation Center for the Blind and Vision Impaired to offer a program for blind and vision impaired 11th and 12th grade high school students. The program, known as the Learning Excellence in Academics Program (LEAP), provides these students the opportunity to participate in college-level courses. The purpose of LEAP is to determine the level of college-readiness skills these students possess along with familiarizing them to the demands of campus life. VCU's SAHP selected the Clinical Laboratory Science Department to teach the Introduction to Science course for the program. The CLS department's role was to introduce Science, Technology, Engineering, Mathematics and Health (STEM-H) curriculum to these students with disabilities. The CLS department utilized mobile devices and iCloud technology to facilitate teaching and encourage independent learning. The CLS faculty designed laboratory procedures focusing on sense of touch to safely incorporate laboratory sessions into the curriculum. A survey to assess outcomes was used to address college-readiness, comfort-level in a laboratory setting, effectiveness of available technology and interest in healthcare professions. In addition, the challenges faced and how they were overcome by the CLS department in presenting the main disciplines of clinical laboratory science through didactic and laboratory instruction in this unique population of STEM-H interested students will be discussed.

1. Blind and vision-impaired students participating in CLS laboratory sessions rated this lab as their favorite:
    a. Performing Venipuncture
    b. Blood Donor Role Playing
    c. Pipet Calibration
    d. Streaking Agar Plates

2. The percentage of students planning on majoring in a healthcare field after participating in the CLS STEM-H program increased by:
    a. 10%
    b. 20%
    c. 60%
    d. 100%

Promoting Interprofessionalism in an Academic Environment

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Interprofessional education (IPE) and interprofessional collaborative practice teams are becoming more prevalent within the health care sector. There is an increasing amount of research in this area, however, the literature is lacking regarding the incorporation of clinical laboratory science (CLS) students in IPE efforts. In 2015, LSU Health Sciences Center (LSUHSC) established a Center for Interprofessional Education and Collaborative Practice. The goal of this center is to coordinate student education utilizing a team-based, patient-centered approach. With this goal in mind, the School of Medicine and the CLS department developed an IPE experience for their students. The clinical focus of the case-based session was blood and hematopoiesis and the IPE focus was exposure to two Interprofessional Education Collaborative competencies: Roles/Responsibilities and Interprofessional Communication. A total of 254 students (49 CLS students and 205 medical students) participated in the two hour IPE experience, which included pre- and post-surveys for assessing student perceptions. Although this was a single IPE experience, there was statistical significance between the pre- and post- assessment scores. Many medical students stated they had developed an increased understanding of the role of the CLS. These results indicate that incorporating IPE experiences in the academic setting increases communication and knowledge of roles among health professional students. CLS students expressed that they often have to explain their profession to others, including students in other healthcare fields. False accusations of laboratory errors due to not fully understanding clinical laboratory testing or the role of practitioners could be minimized with increased communication and interaction between different healthcare students during their educational training. Increasing CLS participation in IPE activities will increase the awareness of the profession and help improve the quality of patient care. Future IPE sessions are planned with CLS and Physician Assistant students, in addition to a campus-wide IPE course for students from all clinical departments at LSUHSC.

1. Which two health care professions participated in the Interprofessional Education (IPE) experience described?
   A. CLS and Physician Assistant
   B. CLS and Physical Therapy
   C. CLS and Medicine
   D. CLS and Nursing

2. What topic was discussed during the clinical case–based session involving the two groups of students?
   A. immunohematology
   B. blood and hematopoiesis
   C. coagulation
   D. urinalysis

A New Model for Teaching Clinical Mass Spectrometry

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The utilization of mass spectrometry is growing in multiple disciplines within the clinical laboratory. The demand for Medical Laboratory Scientists with knowledge and expertise to perform analyses with mass spectrometry based analytical systems is rapidly increasing. We have developed a comprehensive and collaborative approach to educating CLS/MLS students at the undergraduate level, to better prepare them for this career opportunity. Through a partnership between the CLS Dept., the Clinical Chemistry Lab, and the Laboratory of Pharmacometabolomics and Companion Diagnostics at VCU, and the Sciex Corp., we have introduced instruction and hands-on experience with a mass spectrometry based assay in an undergraduate Clinical Chemistry & Instrumentation course. Our innovative approach includes practical experience with sample preparation, liquid chromatography, and mass spectrometry data analysis. Software from the instrument vendor, operating in the simulation mode, and real data generated from samples prepared by students, analyzed and visualized in real time via remote monitoring software is utilized. This novel approach teaches how a CLS/MLS interacts with a LC-MS/MS system to generate clinically reportable data. Screen recording software is also utilized to provide a record of their work in a format that the student can take with them when they graduate. This approach can be adopted by any CLS/MLS program that can partner with a lab that has a mass spectrometer. We will demonstrate the use of the software as an instructional tool. Learning outcome data is being collected, and will be presented at the demonstration.

1. An internal standard, used in a chromatography/mass spectrometry to measure the concentration of a specific analyte, should ideally have which of the following characteristics?
    a. The same extraction efficiency, retention time, and mass, as the analyte
    b. The same extraction efficiency and retention time as the analyte, but a slightly different mass
    c. The same retention time and mass as the analyte, but a different extraction efficiency
    d. The same extraction efficiency and mass as the analyte, but a different retention time

2. Before you can report patients' results obtained with a chromatography/mass spectrometry system, the raw data for each patient should be evaluated for:
    a. Chromatography baseline and peak shape
    b. Fragment ion retention times and ion ratios
    c. Absolute counts for the internal standard ions
    d. All of the above