Clinical Laboratory Educators' Conference 2009 Abstracts

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POSTER PRESENTATIONS

Presenters are listed in bold face type.

Accreditation of the Biomedical Sciences Program at Qatar University: A Step Toward Global Academic Standards

Victor A. Skrinska, PhD, DABCC, **Cindy A. Brown, MA, CLS(NCA), MT(ASCP),** Adil A. Makkiya, PhD, and Nahla M. Afifi, PhD, Qatar University, Doha, Qatar

The National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) has an interest in accrediting academic programs at an international level. However, prior to 2008, no international programs were successfully accredited. Reasons for the lack of accredited international programs are not clear. The array of diagnostic tests and instrumentation at major health centers worldwide are similar. Perhaps regional differences in culture or academic administration have inhibited programs from seeking accreditation. With the assistance of a Lead Scholar experienced in accreditation, the Biomedical Sciences Program at Qatar University moved toward accreditation by reviewing curriculum, policies, and resources and identifying adjustments necessary to meet NAACLS standards. Adjustments included restructuring selected courses, improving documentation, and identifying a qualified Program Director. An Application and Preliminary Report were submitted in May 2006 and a Self Study in February 2007. The Program hosted a Site Visit by three site visitors in November 2007. Additional adjustments were made in response to concerns raised from the Preliminary Report, Self Study Paper Review, and Site Visit Report. The Biomedical Sciences Program was successfully accredited by NAACLS on April 30, 2008 for a five year period, the maximum allowed for initial accreditation. This is the first program accredited by NAACLS outside the United States and Puerto Rico. The Biomedical Sciences Program at Qatar University demonstrated that international programs with significantly different administrative structures and regional cultures can successfully achieve accreditation by NAACLS if they are willing to make modest to moderate adjustments in their curriculum, policies, and resources.

Associate Versus Bachelor Degrees: The Effect of Licensure and Roles for Clinical Laboratory Professionals and the Implications for Preparatory Programs

Jennifer D. Perry, MS, MT (ASCP), Michael Cunningham, EdD, Marshall University, Huntington, WV

The purpose of this study was to determine the overall degree of effect, if any, that state laboratory licensure regulation had on the level of job distinction of associate versus bachelor prepared laboratory professionals and, if correlations were identified, to determine the effect of specific components of licensure regulation, such as continuing education, certification examination, training, and degree requirements had on the level of job distinction between the two groups. A quantitative study was conducted through the distribution of an IRB approved electronic survey to a clinical laboratory educators list serve, which included clinical laboratory science educators, program directors and laboratory managers across the country. Upon closer examination of individual licensure requirements of each state, the survey addressed individual variables of the licensure standards and their relationship or lack of thereof to job distinction. The study found that nearly a quarter percentage of educational institution respondents felt that licensure directly affected MLT/CLT and MT/CLS course content and caused the addition of a continuing education component. A comparison of current state licensure job distinction duties and the proposed levels of practice formulated by the ASCLS, AMT, CLMA and Abbott Diagnostics interagency task force revealed both strong similarities and differences that warrant further examination. The study also showed that in many instances, job distinction duties defined by state licensure were very subjective and open to individual interpretation, which also highlighted the need for individual states to develop more specific and consistent guidelines for clear scopes of practice between the two groups.

Clinical Laboratory Practitioners' Perceptions of Clinical Laboratory Science Student Preparedness for the Workplace: A Q Methodological Study

Georgia A. McCauley, PhD, Winston-Salem State University, Winston-Salem, NC

The clinical laboratory workforce shortage is compounded by fewer graduates of accredited clinical laboratory science programs and changes in the clinical laboratory workplace environment. The purpose of the Q methodological study was to investigate and evaluate the viewpoints of clinical laboratory science (CLS) practitioners (N=52) about the preparedness of the CLS student for the workplace. Q methodology is a research design that provides a foundation for the systematic scientific study of subjectivity. The study identified workplace competencies (N=23) needed by entry-level CLS professionals in the clinical laboratory. Data collected by the Q-sorting technique was factor analyzed (r = 0.80/SE (0.069). Three theoretical factor arrays and resulting distinguishing and characterizing statements emerged ($p<0.01$): Factor 1 – Affective Competent , Factor 2 – Cognitive Competent , and Factor 3 – Psychomotor competent. Practitioners believe students need more practical application to improve troubleshooting QC problems, integrating test data, and recognizing discrepancies in test results and suggest the use of problem-based learning, case studies, and more practical laboratory training. Professional conduct and interpersonal skills of student interns is a concern. Students are competent in book knowledge but do not apply critical thinking skills. The findings from the study will help educators in clinical laboratory science programs to redesign curricula to meet the contemporary entry level workplace skills needed by those that employ clinical laboratory science professionals.

Clinical Laboratory Scientists Educate Nursing Students about Point of Care Testing

Kathy Kenwright, MS, MT, MP(ASCP)SI, Wyenona Hicks, MS, MT(ASCP)SBB,
LeiLani Collins, MS, MT(ASCP)SH, CLS(NCA), Cynthia K. Russell, PhD, RN
University of Tennessee Health Science Center, Memphis, TN

Many nursing students do not understand the role of the laboratory in point of care testing (POCT). The Clinical Laboratory Science (CLS) faculty volunteered to demonstrate POCT instruments to seventy-five first year nursing students. The students were administered both a pre-test and a post-test concerning POCT. Pre- and post-test questions also covered the roles of CLS/medical technologists in patient care. Twenty-one percent of students responding to the pretest did not know when they, as a nurse, would interact with a CLS. For example, the majority thought that a medical technologist would be called when they were having problems with patient equipment malfunctioning. Seven percent of the nursing students thought that quality control would be performed *after* testing the patient's sample. After the pre-test survey, a presentation was given to students by the CLS faculty, stressing the importance of quality control, specimen collection, and laboratory accreditation. Afterward, the students collected finger stick blood samples and tested the samples on various POCT instruments. The post-test administered following the CLS presentation revealed that the nursing students did have a better understanding of the role of the CLS after the point of care session. Unfortunately, one participant still thought quality control was performed after testing the patient. Sessions provided by CLS personnel may help future nurses appreciate the roles of clinical laboratory personnel in patient care.

Developing Academic Integrity by Discouraging Academic Dishonesty in Online Courses

Janice M. Conway-Klaassen, MS, CLS (NCA), MT(ASCP)SM, Janis M. Glatzel, MS, MT(ASCP), Deborah E. Keil, PhD, MT(ASCP), University of Nevada, Las Vegas, Las Vegas, NV

With the development of online and blended course delivery formats, faculty are facing new issues related to academic integrity in the electronic age. Online quizzes and testing, although convenient present concerns about academic dishonesty, accountability, and cheating that most faculty have not yet had to deal with. In addition, the current student culture does not always accept our traditional definitions of what is appropriate academic behavior and what is considered cheating. We found ourselves in a quagmire of student cheating which resulted in the suspension of four students from our CLS Program while two other students received failing grades on specific CLS projects. This situation placed tremendous stress on the remaining 12 students in our junior class and greatly impacted students' behavior and educational experiences. The campus managers of our online course management system (WebCampus) and the university's Student Conduct Code Officer worked with us to develop mechanisms to publicize and emphasize definitions of academic dishonesty to students in an electronic age and help minimize the chances of cheating by better managing our online course delivery formats. Faculty in CLS developed online question delivery formats to discourage cooperative test taking situations and answer sharing between students while still allowing for the convenience of online testing. New statements describing academic dishonesty for online courses were added to our CLS Student Manual and emphasized during student orientation.

Development of Programs in Health Professions Education

Lillian Mundt, EdD, CLS, Catherine Gierman-Riblon, MEd, RN, Susan Tappert, PT, DPT, Rosalind Franklin University of Medicine and Science, North Chicago, IL

Healthcare is experiencing increasing workforce shortages. Faculty shortages are identified as contributing to these shortagee.[1] A search for health professions education programs revealed that only a few exist. This prompted interdisciplinary faculty in the College of Health Professions at Rosalind Franklin University of Medicine and Science (RFUMS) to develop programs to ensure a future supply of healthcare educators. Directors of Clinical Laboratory Science, Physician Assistant, and Physical Therapy programs, along with their faculty, were invited to participate in a survey regarding the need for Health Professions Education programs. The survey was delivered online using Survey Monkey and included questions that asked participants (n = 261) to rate the importance of training in education, the need for such training, and how likely they are to enroll in a health professions education degree or certificate program. Participants in this survey responded that it is important that educators of health professionals have an advanced degree in education (65%). Fewer (57%) felt that a certificate in education is important. Most (88%) indicated that there is a need for an online MS degree in Health Professions Education. However, only a few (21%) were likely to enroll in a program, because most participants already had education training. To meet the perceived need for more educators in the healthcare community, a Master's degree and certificate program were developed. These programs serve to provide current and upcoming healthcare educators with a convenient online mechanism by which to experience collaborative, interprofessional learning and advance their teaching skills.

[1] Association of Academic Health Centers, *Out of Order, Out of Time: The State of the Nation's Health Workforce.* Association of Academic Health Centers. 2008:44.

Efficacy of Clinical Microbiology Instruction via Distance Education using Interactive Television

Nicole Zitterkopf, PhD, MT(ASCP), Carol Wells, PhD, MT(ASCP), University of Minnesota, Minneapolis, MN

Due to the current workforce shortage for laboratory professionals, many CLS programs are adopting various distance education modalities to deliver instructional material to geographically distant sites. The University of Minnesota, Minneapolis, has just begun offering its CLS program at two performance sites in different areas of the state, namely the Minneapolis and Rochester campuses. Lectures in Clinical Microbiology were delivered in-person to students in Minneapolis (n=38), while the lectures were simultaneously viewed by students in Rochester (n=13) via interactive television (ITV). The instructor could see the Rochester classroom via ITV, and students at Minneapolis and Rochester had the same opportunity to ask questions in real time. Although the lecture material was also available online as Powerpoint presentations with audio, attendance at the lecture sessions was generally ~90% at both geographic sites. Results of the first major written examination revealed a similar level of knowledge by students at both sites. For this a 100-point exam, average scores (avg ± SD) at Minneapolis and Rochester were 72.9 ± 11.9 and 71.5 ± 11.7, respectively, indicating no detectable difference in the two groups (unpaired t-test). Taken as a whole, the overall average score of the class (n=51) was 72.5 ± 11.7 and the data were normally distributed. These data suggest that delivery of lecture material via ITV may be equally as effective as face-to-face delivery in a traditional classroom format. The data further suggest that students receiving distance education via ITV are not disadvantaged compared to those receiving more traditional education.

E-Portfolio: A Method to Assess Competency in Blood Cell Identification

Sandra M. Weiss, EdD, CLS (NCA), Neumann College, Aston, PA

Electronic portfolio (EP) is a digital shell, which may contain images, video, text and sound. EPs can evaluate and assess competency. They are recognized as a viable learning method in many fields, such as art, nursing, and teacher education. These educators consider the EP a more authentic and an externally valid approach to assessment in comparison to traditional methods. In EP development, students organize the content connecting each artifact with a learning goal and then provide a rationale as evidence. In this study, students are engaged in their own meta-cognitive development through digital technology, the Internet, and Blackboard Vista use. Students in a hematology course were assessed on their competency in abnormal and immature blood cells identification through submission of an electronic portfolio. Traditionally, teaching cell identification requires an enormous amount of instructor time. In the development of the EP, students used Nikon microscopes fitted with digital cameras interfaced with computers using a Microsoft operating system. Students spent three to four hours a week looking at peripheral blood and

bone marrow smears seeking the perfect representative cell for their portfolios. Students collaborated with each other and evaluated their own work. At the conclusion of the semester, the students spent more hours identifying cells on blood and bone marrow smears than students in the past. Students were engaged, motivated, and excited about cell identification and taking digital pictures. Finally, students' performance on a practical examination of cell identification scored equal to or higher than previous years in blood cell identification.

Forging an International Educational Partnership through Distance Education

Elaine M. Keohane, PhD, University of Medicine and Dentistry of New Jersey, Newark, NJ; Kyung Jin Cho, PhD, Korea University, Seoul, Korea

In Spring 2008 the authors began to co-teach Hematology I and II in English to Clinical Laboratory Science (CLS) students at Korea University (KU) using a real-time educational environment with two-way audio and video, called a G-Class. The goal is to enhance opportunities for KU graduates to obtain certification and employment in the U.S. and other English-speaking countries by improving English comprehension and test-taking skills, learning English pronunciation from a native-language speaker, and learning about CLS practice in the U.S.. The host professor at KU and guest professor in the U.S. jointly plan the courses. The guest professor provides the lectures, while the host professor is on site at KU to elaborate on concepts, handle technology issues, and conduct the laboratory sessions. Lectures are presented using Power Point and both professors have the ability to annotate on a white board. Questions for students are imbedded in the presentations for class participation. Evaluation mechanisms include multiple-choice tests, lab reports, and oral and written case study presentations. Thirty-four students completed Hematology I, and the mean and median course grades were 82% and 85%, respectively. Fourteen of those students subsequently enrolled in Hematology II (an elective at KU). Based on initial student performance and informal feedback, the teaching strategies appear to be effective. Student outcomes will be further assessed by ongoing formal course evaluation by students, and analysis of course grades, graduate performance on U.S. certification exams, and surveys of graduates who sought and obtained employment or advanced education in the U.S.

Hematology Student Go Back to Kindergarten

Meridee Van Draska, MS, CLS(NCA), Illinois State University, Normal, IL

There are several theories defining learning styles, the most widely accepted divides learners into three groups, visual learners, auditory learners and kinesthetic learners. Lecture addresses the needs of the visual and auditory learner, but does little for the kinesthetic learners. Kinesthetic learners fair better in a student laboratory setting where they can actively manipulate specimens, equipment and glassware as they gain knowledge of basic concepts. A technique I use to help kinesthetic learners better understand red blood cell morphology is to incorporate the use of Play-Dough®. The students are assigned an interactive tutorial on red cells that must be completed before class. In class, I lead them in a discussion of what they learned in the tutorial. During the discussion, students are asked to make Play-Dough® models of the cells. Students can manipulate the clay and can see a true three dimensional model of the cells. Recently, I taught two laboratory sections each with fourteen students. In one section I used the clay models and in the other I did not. On an exam covering red cell morphology and inclusions, the group which made the clay models scored three percentage points higher on average than the group that did not. Pulling out the questions that dealt specifically with shape, the students who did not make clay models missed 5 questions for every two questions missed in the other group. While the difference slight, I feel the exercise was beneficial enough to continue using it in the future.

Opening Professional Classes to Other Majors: A Successful Recruitment Effort

Margaret Reinhart, MS, MT(ASCP), University of the Sciences in Philadelphia, Philadelphia, PA

The shortage of Clinical Laboratory Scientists/Medical Technologists is due in large part to a lack of students going into the field. Recruitment efforts are hampered by the fact that few people are aware of what Clinical Laboratory Science (CLS) professionals do. Even university science majors, a group who potentially would be interested in the career, are for the most part unaware of what CLS professionals do. As a recruitment effort, laboratory based classes currently designed for the CLS majors were opened to other science majors. Also, the department of biological sciences at the University of the Sciences in Philadelphia counted these courses as biology electives for their majors. This proved to be a very successful recruitment effort. Among the ten 2008 graduates, only four had begun as CLS majors, whereas six were originally other science majors including Biology, Microbiology, Physician Assistant and Pharmacy

majors. Of these, five had become interested while taking a Hematology, Clinical Immunology or Human Parasitology course, which are laboratory-based courses designed for CLS Majors. Among the current fourth year class, four began as CLS majors, and four were Biology, Biochemistry or Physician Assistant majors. The students claim that they developed interest in the career through the laboratory work: performing differentials and identifying abnormal cells, parasites, and fluorescent ANA patterns etc. As a result of our experience, we suggest opening classes to other majors. It is also suggested to have them either cross-listed, or counting toward other majors' requirements.

The Place of 3D Multi-User Virtual Environments in CLS Professional Education

Susan Stalewski, MBA, MT(ASCP), University of Wisconsin-Milwaukee, Milwaukee, WI

The University of Wisconsin-Milwaukee Clinical Laboratory Sciences program has implemented Second Life, a 3-D, multi-user virtual environment as a means of engaging students in interactive learning as well as modeling and encouraging life-long learning skills. Multi-user virtual environments, such as Second Life, allow for synchronous and asynchronous interaction between students, instructors, and the world. These environments differ from games, where participant activity is directed by the game creator. The educational use of virtual worlds as an emerging technology has been the topic of interest at recent Educause, ISTE and Distance Education conferences. This immersive environment is a technology allowing for deeper instruction in a manner not realized in other interactive groups such as chat rooms or popular social media. Didactic instructional units directed toward CLS learning objectives in ethics, management problem solving, interpersonal communication and collaboration were conducted in the Second Life virtual environment. Data evaluating student participation, engagement, and unit effectiveness based on stated learning goals was collected via student and instructor surveys as well as instructor observation. Preliminary results demonstrate that virtual environments enhance the ability for students to develop cognitive skills and practice behavioral and affective skills. It provides a venue for meaningful and engaging learning experiences.

Providing a Link Between Distance Education and the Laboratory

Sandra Ackerman, MEd, MT(ASCP), Cherry Childs MS, MT(ASCP), **Karen Hunter, MS, MT(ASCP),** Lugene Woods MEd, MT(ASCP), Jennifer Stuart, MT(ASCP), University of Arkansas for Medical Sciences, Little Rock, AR

Problem: The clinical laboratory profession is experiencing a critical workforce shortage; programs need to develop new and creative ways to attract students into the Clinical Laboratory Science Profession. The distance learning program at UAMS is designed for students with no CLT experience, who cannot relocate to campus, and are seeking a bachelor's degree in Clinical Laboratory Science. A difficult challenge for educators creating a distance-education program is the psychomotor skills developed weekly in laboratory sessions. To minimize student travel, instructors at UAMS created virtual laboratories as a tool to deliver quality distance education during the semester with a short on-campus laboratory review at the end of the semester. ***Purpose:*** To evaluate virtual laboratories as an educational tool to deliver quality distance clinical laboratory science education. ***Methods:*** Pilot study using virtual laboratories in immunohematology was completed spring 2007, additional disciplines added in 2008. Sixteen survey questionnaires were distributed with a 100% response rate. Using SPSS version 13.0 frequencies and descriptives were generated. **Results:** Respondents agreed virtual laboratories increased understanding of procedures; allowed learning at a self-directed pace; provided immediate feedback; and allowed the acquisition of useful laboratory information. However, a majority of respondents (60%) preferred hands-on learning to virtual laboratories. **Conclusions:** Virtual laboratories complement traditional methods of instruction and can be used as a tool to deliver quality distance education.

Research and Scholarship of Clinical Laboratory Science Faculty Members

Kathy V. Waller, PhD, CLS(NCA), The Ohio State University, Columbus, OH;
Karen R. Karni, PhD, CLS(NCA), University of Minnesota, Minneapolis, MN

To compete successfully in an academic setting and to further the knowledge base within the profession, most Clinical Laboratory Science faculty members are expected to engage actively in research. A national study was conducted to ascertain their research productivity. The objectives of the study included: (1) to profile the demographic characteristics of this group, (2) to determine research activities of CLS educators, and (3) to describe their research environments. In May 2008, an electronic questionnaire was distributed

to 448 educators from 106 colleges and universities with CLS baccalaureate programs. Responses were received from 277 faculty members (61.8%). This presentation provides data from survey respondents. Clinical laboratory science faculty have made some progress in earning doctorates (52.3%), achieving higher ranks (53.8%), and in obtaining external funding (47.3%). However, 72.4% are 50 years or older. Research productivity was evaluated via research publications and presentations, and external funding garnered. Doctorate faculty and tenure track individuals are spending significantly more time in research. The highest ranked statements describing the research environments are: "computer accessibility is excellent" and "research is important for promotion and tenure decisions." "Time available to do research" is the major hindrance characterizing their research environments.

SoftChalk Program Applications in On-line Learning Modules Designed for CLS Curriculum

Barbara Kraj, MS, MT(ASCP), Medical College of Georgia, Augusta, GA

Internet based learning has become an integral part of most contemporary academic curricula. Traditional classroom delivery of a typical course content is more and more frequently supplemented with on-line material which includes additional reading and writing assignments, quizzes or exams with immediate feedback, and discussion boards that document student participation and communication with peers and instructors. Just like in traditional teaching, web-based instruction is best achieved when the content is delivered in an interesting, engaging, and creative way. This is especially important in cases when entire curricula are delivered through internet to students enrolled in distance learning programs. Miller and King (2003) have reported that about one-third of students drop out before completing a distance learning program due to various reasons. An unengaging on-line course content delivery may have significant contribution to on-line student academic performance and subsequently lack of retention. Presented here are several examples of web-based activities designed using Lesson Builder Teaching Program developed by SoftChalk, LLC. The lessons created by SoftChalk technology included but were not limited to short quizzes, drag and drop exercises, matching activities, and crosswords and were incorporated in Clinical Laboratory Science curriculum courses of laboratory Math, Molecular Diagnostics, and Venipuncture. Individual course web page features that allowed for customization and personalization are also displayed.

Students' Perception of the Use of Pre Discussion Quizzes

Mary Muslow, MHS, Louisiana Tech University, Ruston, LA

The purpose of this study was to determine if the use of pre discussion quizzes (PDQs) in a clinical laboratory science pre-clinical Instrumentation class improved students' participation in classroom discussions and ultimately improved students' retention as demonstrated on student surveys and assessment evaluations. A total of 21 students participated in the study. Reading assignments, dates and times for the availability of pre discussion quizzes were indicated in the course syllabus. Pre discussion quizzes were not optional and required completion before the class discussion period. Each PDQ consisted of 5 short answer questions, with answers coming directly from the assigned reading. The quizzes wee taken via the internet using the Blackboard format. The average of the PDQ scores counted as 10% of the students' final grade. Students completed a survey to assess their perception of the utilization of the PDQs. Survey questions assessed the students overall attitude toward the pre discussion format, perception of grade effect, ease of technical usage, stimulation of discussion during class, and overall willingness to use PDQs in the future. Final grades for the PDQ classes were compared to the final grades of a non-PDQ class to determine if there were any positive outcomes from the use of PDQs. Results showed that while the students perceived that the PDQs prepared them for the class discussion and exams, there was no significant change between the PDQ class and a non-PDQ class.

Undergraduate Research Program in the CLS Department at Weber State University

Scott Wright, MS, CLS (M) (NCA), Weber State University, Ogden, UT

Over the last five years, the Clinical Laboratory Sciences (CLS) Department at Weber State University has developed an extremely successful undergraduate research program, one of the largest on campus, involving 30 to 35 students each year. The students enroll in a two semester course, taken either at the junior or senior level. After selecting a faculty mentor in the appropriate discipline in the CLS Department, students go through four initial stages including: research concept and design, literature search, IRB (Institutional Review Board) application, and grant writing. For those projects requiring lab supplies (some projects undertaken in collaboration with hospital or reference labs and do not require university funding), the grants are submitted to the

university's Office of Undergraduate Research and are evaluated on a competitive basis with other student grants from across campus. To date, 100% of the CLS student grants have been funded, compared to a 70% rate from across campus. Once approval and funding is available, the students have approximately two months to complete their research. After completion, the students are required to prepare a journal manuscript in the format of the ASCLS Journal, *Clinical Laboratory Science*. All manuscripts are also submitted to the university's peer reviewed undergraduate research journal, ERGO. All students are required to present their research findings at the university and state levels as oral and poster presentations, respectively. Several of the top projects are selected by the CLS faculty to apply for poster presentations at either the National Conference for Undergraduate Research or the ASCLS national conference.

TECHNOLOGY DEMONSTRATIONS

Conversion of a Clinical Laboratory Science Safety Course to an Online Format Using Blackboard® and Adobe® Presenter

Joanna George, CLS(NCA), SBB(ASCP), Christopher Sidorfsky, MFA, Andrew Yue, CLS(NCA), MT(ASCP), University of Minnesota, Minneapolis, MN

University of Minnesota Clinical Laboratory Science students have traditionally attended an onsite laboratory safety training the first morning of their professional program consisting of PowerPoint® presentations, videos, a safety tour, reading the Laboratory Safety Manual, and completing a take-home quiz. Problems with this format included: 1) inadequate time to synthesize much new information, and 2) readings, assessments, and grading tasks were often not finished before students began their laboratory work. Additionally, expansion of our CLS program to a site outside the metro area prompted a web based curriculum redesign. The safety course was converted to an online format, to be completed offsite, prior to the start of classes in the fall of 2007, and Blackboard® (WebVista) was chosen as the delivery platform. The course was divided into three modules, each containing the existing PowerPoint® slides voiced over with Adobe® Presenter, appropriate sections from the Laboratory Safety Manual, a University-wide safety training component, and a quiz written with the WebVista assessment tool. Achievement of 90% or better was required before subsequent modules would appear. Completion of the course evaluation was rewarded by entry into a prize drawing. Grades were captured into the Blackboard® grade book and reviewed to insure course completion. The traditional instructor led safety tour was replaced with a scavenger hunt to identify safety related items on the first morning of class. To date, 89 students have successfully completed the course. Evaluations indicated high student satisfaction, and no unwanted exposures or accidents in the teaching laboratory have occurred.

Creating a Digital Library of Microscope Slides for Distributed Learning

Stephen M. Wiesner, PhD, MT(ASCP), Cheryl Swinehart, MS, CLS(NCA), Chris Sidorfsky, MFA, Mary Jane Yue, MS, CLS(NCA), Nicole Zitterkopf, PhD, MT(ASCP), University of Minnesota, Minneapolis, MN

To address workforce shortage needs, the Clinical Laboratory Sciences Program at the University of Minnesota has begun to expand its program to distant performance sites. Challenges have arisen surrounding educational assets used to deliver curriculum at the University campus in Minneapolis. In the past, the Program has relied heavily on its association with the University of Minnesota Medical Center for collection of hematology samples. Over the years, a comprehensive slide set from those samples has been assembled that represents many of the rarest hematopathologies. Slides that demonstrate specific diseases are sometimes few in number and cannot easily be recreated for instruction at distant sites. With an increased capacity from 40 to 96 students, it was also unlikely that students would have ready access to these important learning tools. The CLS Program has thus undertaken the process of creating a permanent digital library of slides for distributed learning. Slides are digitally scanned under an 83X oil immersion objective and annotated by CLS faculty to be made available across the state for CLS/CLT programs' instructional use. With commercially available software, students are able to view this slide set online by dynamically scanning the relevant areas of the slide at any magnification between 2 and 830X. One impediment to expansion of CLS/CLT education can be availability of instructional materials. Our approach is being expanded, including samples from mycology, parasitology and bacteriology, and will likely play a central role in distributed CLS/CLT education as new programs are initiated to address workforce shortage needs.

Pathogenic Yeast: Demonstration of an Online Pre-laboratory Lecture using WebVista

Nicole Zitterkopf, PhD, MT(ASCP), Jeanne Krumpelmann, MT(ASCP), Joanna George, CLS(NCA), SBB(ASCP), Chris-

topher Sidorfsky, MFA, Carol Wells, PhD, MT(ASCP), University of Minnesota, Minneapolis, MN

The clinical laboratory sciences program at the University of Minnesota addressed the statewide shortage of clinical laboratory scientists by expanding its program to the University of Minnesota-Rochester campus in September, 2008. The program expansion included generation of technology-enhanced curricula, including online pre-laboratory lectures for the microbiology laboratory exercises. Prior to the program expansion, pre-laboratory sessions were held "live" in the teaching laboratory. Students would view the demonstration of the procedures on-site. However, the distance learning technology would not permit adequate visualization of the demonstrations from the Minneapolis campus to the Rochester campus. Pre-laboratory lectures were created and placed online for students to view through secured log-in to the University WebVista site. The online pathogenic yeast pre-laboratory lecture was created by the instructor using Microsoft Office Power Point. Audio was added to the lecture using Adobe Presenter. Students had access to this material anywhere and anytime on a computer or other electronic device with high-speed internet access. Lectures included cartoons of the gram stain procedure, video of the primary inoculation of plates and gram stain slides, images of yeast, video and cartoons of media inoculation and patient cases demonstrating fungal infections that correlated with the wet-laboratory exercise. Utilizing online pre-laboratory lectures with multi-media instructional capabilities facilitated successful pre-laboratory lectures to distant sites.

Teachers of Tuberculosis (TOT) Project: National Tuberculosis Curriculum Consortium (NTCC)

Maribeth Flaws, PhD, SM(ASCP)SI, Rush University Medical Center, Chicago, IL; Sandra Latshaw, MA, MT(ASCP)SM, University of Nebraska Medical Center, Omaha, NE

The Teachers of Tuberculosis (TOT) Project is an exciting component of the National Tuberculosis Curriculum Consortium (NTCC). The NTCC wants to identify TOT in order to develop a community of teachers who work together to promote and improve TB education in academic settings using NTCC resources (available free-of-charge on the NTCC website, http://ntcc.ucsd.edu). Since 2003, members of the NTCC have been developing the product lines available today including core competencies and associated objectives; over two dozen computerized cases; over 100 multiple-choice questions with teaching points; over 100 multi-media images including radiographs, histologic and pathologic images, and video clips; over 20 clinical case descriptions akin to complete medical records; and more. All NTCC products have been peer-reviewed and vetted by both content and education experts. The next phase of NTCC activity concentrates on dissemination and evaluation of developed products. In order to broaden its reach, teachers of TB are being recruited. As of September 2008, over 200 faculty members in the U.S.A. and around the world are participating in the TOT Project. Several have already reviewed computerized cases and provided feedback as part of the NTCC product improvement plan. Interested faculty members are invited to join the TOT Project by providing their name, title, e-mail address, and affiliation to ntcc@ucsd.edu. This technology demonstration will show the completed work products from the NTCC as well as provide attendees with the opportunity to learn about the TOT Project and volunteer to become a member.

2010 CLEC Abstract Deadline

The deadline for abstracts for poster presentations or technology demonstrations at the 2010 ASCLS Clinical Laboratory Educators Conference (CLEC) is October 1, 2009. Submission instructions and the proposal form may be found at www.ascls.org/conferences. The completed proposal form and abstract must be submitted electronically by the deadline.

The 2010 CLEC will be held February 25-27 in Biloxi/Gulfport, Mississippi. Additional meeting information will be available at the ASCLS Conferences website.