



CLEC 2018 Poster and Tech Demo Quiz

<https://www.surveymonkey.com/r/CLEC18-Quiz>

* 1. First Name

* 2. Last Name

* 3. Email:



CLEC 2018 Poster and Tech Demo Quiz

Abstract 1

Professional Development of Medical Laboratory Science Students during the Clinical Experience

***Tamera M. Alpaugh, M.S., MLS(ASCP)^{CM}
Stephen M. Wiesner, Ph.D., MT(ASCP)**

**University of Minnesota
Minneapolis, MN**

The purpose of this study was to better understand the experiences that influence the professional development, confidence and comfort levels of Medical Laboratory Science students during their clinical experiences. Through reflective journaling, six themes emerged that were most important to the professional development of the students. The most prevalent themes were laboratory operations, communication and teamwork. Students were surveyed each week to identify their comfort and confidence levels during the clinical experience semester. Results demonstrated that the first week of the first clinical experience had the most significant impact on the students' comfort and confidence levels, in comparison to the other weeks of each clinical experience. As a

University-based program, we will seek ways to integrate aspects of laboratory operations, as well as communication and teamwork into the laboratory curricula. Providing an opportunity for students to participate in a mock medical laboratory on-campus may improve student comfort and confidence levels prior to entering their clinical experience semester.

4. Through this study, the most prevalent themes identified were:

- Professionalism, operations and communication
- Teamwork, operations and resilience
- Operations, communication and teamwork
- Lifelong learning, operations and professionalism

5. Which week (1st-3rd) of what rotation (1st-4th) had the most significant impact on the students' comfort and confidence levels?

- 1st week of the 1st rotation
- 2nd week of the 1st rotation
- 1st week of the 4th rotation
- 3rd week of the 4th rotation



CLEC 2018 Poster and Tech Demo Quiz

Abstract 2

Measuring Attitudes of Clinical Laboratory Science (CLS) Students toward Interprofessional Education using the Readiness for Interprofessional Learning Scale (RIPLS)

***Michelle R. Brown, PhD**

Ana L. Oliveira, DrPH

Brianna V. Miller, MLS(ASCP)CM

Floyd Josephat, EdD

University of Alabama at Birmingham

Birmingham, AL

The current complex environment of healthcare demands a comprehensive and collaborative approach where teamwork and collaboration are paramount. Recommendation by the National Academy of Medicine (NAM) on Improving Diagnosis in Healthcare is “Facilitate more effective

teamwork in the diagnostic process among healthcare professionals, patients, and their families.” The objective of this study was to determine the readiness of Clinical Laboratory Science (CLS) students to participate in interprofessional simulation. The revised Readiness for Interprofessional Learning Scale (RIPLS) was chosen to assess CLS student’s attitudes toward interprofessional education before and after participating in an interprofessional simulation. We had 50 master’s degree CLS students participate in the simulations and complete the surveys. The simulation was a large-scale, multi-patient interprofessional scenario that occurred in a simulated ICU. In addition to the RIPLS items and demographics, we asked if students had previous experience with interprofessional simulation, and if students have worked in healthcare. Data was entered and analyzed using SPSS. Our student population had an average age of 26.7 years (SD = 5.25; median age = 25; range = 20), was 70% female and 46% White. In addition, 26% had experience in inter professional simulation, while 48% had worked in health care. Students’ scores were high in all questions of RIPLS subscales but for the questions belonging to the Negative Professional ID (inverted scale) and for the Roles and Responsibilities subscales. UAB CLS students seem ready to learn in interprofessional teams. Faculty in CLS programs should provide interprofessional experiences for their students.

6. The overall theme of this activity is:

- Working with peer CLS students to simulate a day in the laboratory
- Determining if CLS students are ready to learn in interprofessional teams
- Ensuring students are prepared to take the Board of Certification exam
- Evaluating the role faculty play in interprofessional learning

7. Which survey instrument was used to assess the students?

- Improving Diagnosis in Healthcare Scale
- National Academies of Medicine Scale
- Readiness for Interprofessional Learning Scale
- Clinical Laboratory Science Roles Scale



CLEC 2018 Poster and Tech Demo Quiz

Abstract 4

Achieving Simulation Environments – A Case Study

**Lawrence DiGennaro, Master of Architecture, AIA, LEED AP BD+C
BHDP**

Cincinnati, OH

Rapid changes in technology and strong economic pressures are accelerating new developments in Laboratory Medicine. As the nature of the work constantly evolves the need for more hands-on simulation based learning holds the promise to both expose students to time-honored methods while introducing them to new methods that and allow them to experience cutting edge technologies firsthand. Considering the future of what is possible in simulation-based learning, today's educators are left wondering how they can ever afford the steep funding and learning curve necessary to change the current educational experience.

With this poster session, we will provide an in-depth look at how the University of Toledo achieved a new level in hands-on simulation-based learning with its new 65,000 sf, \$34 MM, Interprofessional Immersive Simulation Center (IISC) which opened in April of 2014 with a host of new teaching technologies and learning spaces:

- **Several 3D/VIR CAD Walls – including a large curved 3D CAD wall.**
- **The first 5-sided, seamless LED immersive environment – designed especially for this project.**
- **An i-Space™, providing an immersive environment for training, education, and research.**
- **Virtual hospital equipped with human patient simulators, state-of-the-art clinical equipment, and debriefing rooms.**
- **Surgical and procedural skills suites.**
- **Simulated homecare environment.**
- **Interprofessional collaboration suites.**

We will walk you through their process from identifying the need (Ohio's healthcare worker shortage), to the initial funding request, to the renovation of an existing 12,000 sf building to support a Beta test, and finally to the realization of the completed facility.

8. Which of the following actions was not taken by the team to ensure success?

- Find a compelling driver that will motivate funding sources
- Start with a small-scale pilot project to test the impact of technology on your program
- Take benchmarking tours of existing facilities
- Buy the most expensive equipment your budget can afford

9. Which simulation environments were employed?

- 3D/VIR CAD Walls
- 5-sided LED immersive environments
- Mock Procedure Rooms
- Clinical Skills Lab
- All of the above



Abstract 5

What is Wrong with My Patient

Muneeza Esani, PhD, MT(ASCP)

**University of Texas Medical Branch
Galveston, TX**

Case studies are utilized in all Clinical Laboratory courses to allow students to apply the knowledge they have learned to a simulated patient situation. “What is Wrong with My Patient” was a case scenario that was assigned to each student enrolled in the spring 2017 Clinical Chemistry I course and plasma samples were created with appropriate amounts of laboratory analytes to fit the case. The goal of this activity was to allow students to develop critical thinking skills for evaluation of patient symptoms, make decisions regarding necessary lab work based on patient condition, evaluate sources of error in testing, develop a differential and final diagnosis, and present findings to their peer group. Each student received their personal patient sample which interestingly led to display of ownership of their patient. Students were allowed to run all of the analytes that were available for student lab exercises including glucose, bilirubin, hemoglobin A1C, cholesterol, triglyceride, electrolytes, creatinine and enzymes. Results were recorded on a lab report and were presented to the class at the end of the semester. A survey of students was conducted to record their satisfaction with this activity. The results of this survey suggested that 100% (n=40) of students thought that this activity enhanced their learning experience in the course. Around 95% of students recommended that this activity be utilized in future classes. Student suggestions were also recorded to improve this activity for future courses.

10. Which of the following was NOT a goal of “What is Wrong with My Patient” activity?

- Develop critical thinking skills
- Develop a differential and final diagnosis
- Present findings to peer group
- Successfully treat the patient's condition

11. Which of the following was an unexpected outcome of “What is Wrong with My Patient” activity?

- Ownership of patient's case
- Better outcome for patient
- Better learning experience for student
- Better grade in the course



CLEC 2018 Poster and Tech Demo Quiz

Abstract 6

Bridging the Employment Gap: Meeting the Needs of Rural Healthcare

***Karyn Fay, MS, MLS(ASCP)^{CM}, SH**
Kelsey Johnson, MBA, MLS(ASCP)^{CM}
Brigitte Morin, MS

Michigan Technological University
Houghton, MI

There is a severe shortage of Medical Laboratory Scientists in hospitals across the United States. Rural hospitals are especially impacted by this shortage due to their limited pool of professional candidates. The lack of Medical Lab Scientists is also due in part to unawareness of the profession as a whole, which results in low numbers of students graduating from these programs. Michigan Tech University (MTU) is increasing the visibility of the program by educating high school students about MLS and the high demand for laboratory professionals, through various interactive on-campus activities. By involving these students at an early age, the goal is to attract students to the profession to increase program enrollment, which would lead to increased practicum students in rural healthcare systems. Hospitals often rely on retaining students for employment after their practicum is completed to meet staffing needs. Rural hospitals are rarely NAACLS-accredited, and rely on University-based programs, like MTU, to supply them with well-qualified students. The current number of MTU graduates employed in the regional rural laboratories supports this premise. With the increasing number of laboratory professionals retiring, it is essential to attract and retain local talent. This begins with educational awareness and programs at the middle school and high school level. The ongoing goal is to determine the impact of MTU's outreach programs on bridging the employment gap in rural healthcare by tracking student enrollment, placement, and employment within a rural healthcare system.

12. Bridging the employment gap in rural healthcare involves all of the following except:

- Increasing the awareness of the MLS profession
- Interactive programs at the secondary education level
- Ceasing to take practicum students as a result of cost-saving efforts
- Attracting and retaining local talent

13. MLS recruitment efforts at Michigan Tech include collaborations with each of the following except:

- Summer Youth Programs
- Health Occupation Student Association (HOSA)
- High school science classes
- American College Health Association (ACHA)



CLEC 2018 Poster and Tech Demo Quiz

Abstract 7

Utilizing Virtual Microscopy to Enhance MLS Curriculum

*Lindsay Gilbert, M.Ed., MLS(ASCP)^{CM}
Cherika Robertson, M.Ed., MLS(ASCP)^{CM}
Catherine Smith, M.Ed., CT(ASCP)
Jason Key, M.Ed., MLS(ASCP)^{CM}
Leticia Nunez-Argote, MPH, CPH, MLS(ASCP)^{CM}

University of Arkansas for Medical Sciences
Little Rock, Arkansas

Problem: Laboratory science students need the opportunity to complete real life labs outside of the classroom. The main goal is to improve competency levels among students in the areas of identifying microbiology, hematology, body fluid, and cytology disorders. By creating an interactive learning environment through virtual slide assignments, students are able to practice microscopy skills continuously without access to lab equipment. **Methods:** To address this need, the faculty developed virtual slide exercises through the Leica Biosystems website using Aperio Slidehosting software. A preliminary study was implemented in the microbiology course by incorporating digitally scanned gram stains into the lab curriculum. To determine the general attitude toward learning through virtual microscopy, a five level Likert scale questionnaire was issued to the

microbiology students. Results: There was a 50% response rate from the students. 100% felt the virtual exercises provided the needed additional practice, 100% felt the exercises reinforced the lecture and lab content, 89% felt the exercises helped them acquire useful microscope skills, and 75% felt the online software was easy to use. The supplementary training provided students ownership of their learning and increased laboratory performance. Conclusion: The preliminary results of the questionnaire indicate the lessons improved the students' overall ability to correctly identify cells, perform cell counts, and identify bacteria in patient samples. The Department of Laboratory Sciences has also developed virtual slide exercises for hematology, body fluids, and cytology courses. Additional survey results will be determined at the end of the fall 2017 semester.

14. What is the software used to create virtual slide exercises?

- Panoptiq
- Aperio Slidehosting
- Virtual Slidebox
- VENTANA Virtuoso

15. What percent of survey participants felt the virtual exercises improved their microscopy skills?

- 56%
- 77%
- 89%
- 100%



CLEC 2018 Poster and Tech Demo Quiz

Abstract 8

Predictors of Medical Laboratory Science Students' Scores on the Board of Certification Exam

*Stephanie Blackburn, MHS, MLS(ASCP)^{CM}
Lynda Britton, PhD, MLS(ASCP)^{CM}
Lee Ellen Brunson-Sicilia, MHS, MLS(ASCP)^{CM}

Louisiana State University Health School of Allied Health Professions
Shreveport, LA

The faculty in the Clinical Laboratory Science (CLS) program at Louisiana State University Health (LSUH) Shreveport School of Allied Health Professions sought to identify variables to best predict

students' success on the ASCP Board of Certification (BOC) Examination for Medical Laboratory Scientists (MLS). In January 2015, the CLS program began purchasing access to the MediaLab, Inc. Exam Simulator for all senior students. Prior to utilization of Exam Simulator, the average BOC score at LSUH was 505. After student access to Exam Simulator, the average BOC score increased to 528. Multiple variables were considered as predictors of success on the BOC; including all Exam Simulator sessions attempted by students, MLS computer adaptive practices tests on Exam Simulator, LSUH grade point average (GPA), and overall GPA. Results from regression analysis revealed that the level of difficulty ($\beta = .459$, $t(32) = 2.92$, $p < .05$), mean score ($\beta = .366$, $t(32) = 2.23$, $p < .05$), and highest score ($\beta = .484$, $t(32) = 3.13$, $p < .05$) on the MLS computer adaptive practice tests were significant predictors of BOC scores. Likewise, graduates' GPA at LSUH was also a significant predictor of BOC score ($\beta = .426$, $t(32) = 2.75$, $p < .05$). The findings of this study revealed the importance of providing computer adaptive practice examinations for senior students prior to taking the ASCP BOC examination.

16. In computerized adaptive testing, the examinee's next test item given is determined by:

- Length of time remaining on the exam.
- Overall exam difficulty.
- Previous response on the exam.
- Randomization of test questions.

17. Two predictors of student success on the ASCP BOC recognized during the data analysis performed by the LSU Health Shreveport CLS program are:

- Highest score of computerized adaptive testing on MediaLab, Inc. Exam Simulator and overall GPA.
- Mean score of computerized adaptive testing on MediaLab, Inc. Exam Simulator and GPA at LSU Health Shreveport.
- Microbiology and hematology grades at LSU Health Shreveport and mean score of computerized adaptive testing on MediaLab, Inc. Exam Simulator and
- Overall GPA and GPA at LSU Health Shreveport CLS program.



CLEC 2018 Poster and Tech Demo Quiz

Abstract 9

Electronic Tools and Media for Teaching Microscopic Skills

*Daniel Haun, BS, MLS(ASCP)^{CMH}
Angela Foley, MS, MLS(ASCP)^{CMSH}

The most common digital visual media used to teach microscopic skills are still images of significant findings. More recently, whole slide imaging applications are available which allow for slide scanning simulations. Both are important innovations for teaching and assessment, but both have limitations. The single still image is easily delivered and embedded into interactive tools, but the single image does not simulate the discovery aspect of microscopy nor does it provide sufficient contextual information necessary for the critical thinking aspects. The whole slide imaging method provides this context but requires the delivery of gigabyte quantities of digital data and thus requires special host servers and viewers. These limit the usefulness of the media and preclude embedding the media into interactive learning tools. Neither method allows for exploration of focal planes, which is often necessary to the discovery and interpretation of findings. We created a new media alternative yielding interactive teaching applications that address some of the limitations of the commonly used methods. These applications provide for both scanning simulation and focal plane exploration. The applications also model the critical thinking components of practice. All media is prepared in standard formats requiring, at most, single-digit megabyte levels of data transfer. This allows for versatility in embedding into a variety of interactive learning and assessment tools. Applications will be demonstrated in Hematology, Urinalysis, Parasitology and Body Fluid analysis. We are prepared to discuss the image collection, preparation and implementation of the tools.

Note: A short silent video of a body fluid teaching exercise can be found here:

http://alliedhealth.lsuhsu.edu/ClinicalLaboratory/bodyFluids/lsuhsc_demo.mp4

18. Which of the following statements is (are) true about microscopic digital images for web delivery?

- More megabytes yield better resolution images
- More pixels yield better resolution images
- Both a and b are correct
- Neither a nor b are correct

19. The compression of microscopic digital images into jpeg format for web delivery:

- allows for fast delivery via the internet
- results in a substantial loss of repetitive image data
- does not appear to degrade user experience
- all of the above



Abstract 10

Teaching Molecular Microbiology: Next Generation Sequencing vs. Multiplex PCR

***Ericka C. Hendrix
Katie M. Bennett
Trevor Burrow
Travis Warmoth**

**Texas Tech University Health Sciences Center
Lubbock, TX**

**Phillip K. Scheible
Al Zubaer Mohammed**

**MicroGen Dx
Lubbock, TX**

Experience in Next Generation Sequencing (NGS) is a highly desirable skill for molecular technologists. Previously, our Molecular Pathology program partnered with a local laboratory affiliate to develop a hands-on NGS educational protocol. Recently, we expanded this instructional laboratory to include the BioFire FilmArray instrument, a sample-to-answer multiplex PCR platform. We used these two methods to illustrate the strengths and weaknesses of each technology and to reinforce the principles of molecular microbiology. After several classroom lectures, 18 students were given a protocol to prepare an NGS DNA library from unknown bacterial isolates. Each student performed DNA isolation, PCR of 16S rRNA, and magnetic bead PCR purification. The samples were given to the affiliate laboratory for loading and analysis on the Life Technologies Ion Torrent NGS platform. Meanwhile, the students were paired up to perform the FilmArray gastrointestinal assay on their pooled bacterial isolates. Students compared the quantitative results of NGS with the qualitative results of the FilmArray, and they were able to determine which bacteria were detected by each method as compared to the key. There was high correlation between the two methods, although some false negatives and false positives were observed for each assay. These observations were used for classroom discussions about differences in microbial DNA isolation efficiencies, test menus, analytical sensitivities, and procedural limitations of each method. In sum, the integration of the NGS and multiplex PCR methods into a unified laboratory unit provided valuable hands-on technical experience while simultaneously illustrating the concepts of molecular microbiology.

20. Which organism was a false negative in the Biofire Filmarray assay in one of the nine student groups?

- Yersinia enterocolitica*
- Vibrio parahaemolyticus*
- Pseudomonas aeruginosa*
- Salmonella enterica*

21. Which of the following is the correct workflow for the major steps that were used for the Next Generation Sequencing library preparation protocol?

- Bacterial selection, DNA isolation, Electrophoresis, Bead cleanup, PCR amplification, Electrophoresis, Pooling, Quantification
- Bacterial selection, Bead cleanup, DNA isolation, Electrophoresis, Quantification, PCR amplification, Electrophoresis, Pooling
- Bacterial selection, Quantification, DNA isolation, Electrophoresis, PCR amplification, Electrophoresis, Bead cleanup, Pooling
- Bacterial Selection, DNA isolation, PCR amplification, Electrophoresis, Bead cleanup, Electrophoresis, Quantification, Pooling



CLEC 2018 Poster and Tech Demo Quiz

Abstract 11

Proposed Modification to a MLS Program for Better Student Preparation

Lisa H. Hochstein, M.S., MLS (ASCP)^{CM}

**St. John's University
Queens, NY**

The MLS program looked at a different way to deliver the professional year curriculum to better prepare students for clinical rotations. Our professional year consisted of lectures in our clinical courses running concurrently with clinical rotations. Over several years, some of the clinical affiliates felt the students were not as well prepared didactically as students from other programs. They also felt a three day per week rotation schedule was not enough time for the students to learn all aspects of a laboratory section. Based on these comments, a change was made for the 2016-17 academic year. During the first seven weeks of the semester, students were in class five days a week taking all the clinical course material. The final eight weeks of the semester were for rotations also five days per week. After the year, surveys were sent to the affiliates, students and faculty to comment on the change. Both students and faculty did not like the changes made. Faculty felt pressured to complete the didactic material in a shorter amount of time. Students felt they did not have enough study time before an exam was given on the material. The clinical affiliates were split

about the changes made. The majority indicated that students were only somewhat better prepared. Results of performance on the ASCP certification exam were not as good as in past. Thus, the MLS program will return to the previous preparation of students for rotation.

22. How did the change in program delivery change the amount of rotation days?

- Increased
- Decreased
- No change
- Needs more time

23. Why did the faculty dislike the change in program delivery?

- Too much lecture material to be covered
- Too rushed in the delivery of the material
- Too short a time for the lectures
- More material needs to be included



CLEC 2018 Poster and Tech Demo Quiz

Abstract 12

Enhancement of Junior Level Curriculum through the Utilization of “Lunch and Learn” Sessions

Melissa Jamerson PhD, MLS(ASCP)^{CM}

**Virginia Commonwealth University
Richmond, VA**

The Department of Clinical Laboratory Sciences at Virginia Commonwealth University incorporated “Lunch and Learn” sessions into the junior level Immunology course. Students attended the sessions during their regularly scheduled lunch on days that their Immunology course was scheduled. The sessions included guest speakers who lectured on a variety of topics. These topics included careers in Immunohematology, interviewing skills, the interview process, mock interviews and membership in the American Society for Clinical Laboratory Sciences. The sessions allowed students to gain knowledge about Immunohematology a semester earlier than in previous years. This was especially important because it allowed them to apply for an Immunohematology related scholarship. Several sessions focused on enhancing the students’ interviewing skills to make them more competitive for student worker positions and post-graduation employment. Feedback from

students indicated that these sessions made them feel more prepared for student worker interviews and feedback from interviewers was very positive indicating an overall improvement from previous years. Additionally, students received information about the benefits of American Society for Clinical Laboratory Sciences membership, which resulted in student attendance at the annual Virginia American Society for Clinical Laboratory Sciences meeting. Overall, the Lunch and Learn sessions that were incorporated allowed our department to expose students to valuable topics that are not part of our traditional Clinical Laboratory Sciences curriculum.

24. Which of the following areas were included in the “Lunch and Learn” sessions?

- Information about careers in Immunohematology
- Interviewing skills
- Membership to ASCLS
- All of the above

25. Student feedback indicated that most helpful session/sessions were:

- Mock interviews
- ASCLS membership
- Information about careers in Immunohematology
- Both a and b
- Both a and c



CLEC 2018 Poster and Tech Demo Quiz

Abstract 13

Educating the Providers: CLS Educators Offer Their Expertise

***Koy Kubala, MS, SBB(ASCP), MLS(ASCP)^{CM}MB**
Barbara Sawyer, PhD, MLS(ASCP)^{CM}MB

Texas Tech University Health Sciences Center
Lubbock, TX

An interprofessional activity designed to be constructive in developing a good relationship with Clinical Laboratory Science (CLS) educators and healthcare providers was planned. Specifically, competency in performing and interpreting waived and moderate complexity laboratory tests

accurately was discussed as an issue often viewed as a challenge by certain providers. Registered nurse practitioners (RNPs) from varied backgrounds and CLS educators worked together to overcome this challenge. CLS educators familiar with point-of-care testing provided a session for RNPs to review the basics of point-of-care test (POCT) performance and interpretation. These RNPs are typically distance education students attending contact sessions to fulfill requirements for their specialty practice. Lab testing procedures and interpretation of drug screens, strep and flu screens, urinalysis, and wet preps were reviewed and discussed in this session using a PowerPoint presentation, instrument demos and brief quizzes. The critical nature of quality control use with these tests was stressed to the RNPs. CLIA '88 was explained to illustrate the need for standardization of all lab testing from waived to high complexity testing. A brief questionnaire provided at the end of the presentation indicated overall attainment of the objectives including the provision of helpful information and clarification of issues regarding POCT performance and QC.

26. Interprofessional exchange of knowledge through communication and education are important aspects of healthcare and patient safety. In our project, we considered the main reason for sharing our expertise with another healthcare profession to be:

- learning about and correcting another profession's weaknesses.
- preventing errors and miscommunication when caring for patients in a different field of healthcare.
- demonstrating mutual respect between CLS professionals and other healthcare professionals.
- showing the extensive knowledge CLS professionals have in regard to other fields of healthcare.

27. An issue that continues to be an area of concern when point-of-care testing is performed by providers such as nurses or nurse practitioners is:

- performance and interpretation of quality control analysis.
- maintaining patient privacy.
- reporting patient results accurately.
- lack of knowledge regarding performance of the tests



CLEC 2018 Poster and Tech Demo Quiz

Abstract 14

Comparison of Student Outcomes from Two Different Formats of Phlebotomy Education

Carlo J Ledesma, MS, SH(ASCP), MT(ASCP), MT(AMT)

This study aimed to investigate if delivery of instruction is a direct contributor to students' psychomotor and affective skills in phlebotomy practicum. In the Department of Medical Laboratory Technology and Phlebotomy, students are enrolled in HSPC 1234 Comprehensive Phlebotomy (8 week class that is delivered in a traditional in class setting for Phlebotomy students) and HSML 1221 Comprehensive Phlebotomy (Interim class delivered in a hybrid format for Medical Laboratory Technology students). Both classes have the same content for objectives, lecture materials, skills training and assessments. After successful completion of the didactic phlebotomy classes, students are enrolled in a clinical rotation containing the same evaluation standards for psychomotor and affective skills. Student preceptors are given an evaluation checklist that assess the students' psychomotor and affective skills during their clinical rotation in phlebotomy. These preceptor evaluations were compiled and reviewed. Comparison studies was accomplished by performing a 3 year retrospective review of clinical evaluations from both deliveries of instruction. It was determined based on the comparison studies that no significant difference was observed on the psychomotor and affective skills of the two sets of students; preceptor evaluation shows congruence in their evaluation between the hybrid students and the traditional in-class students. The researchers conclude that there is no significant impact on psychomotor and affective skill on students enrolled in phlebotomy clinical rotation despite method of delivery.

28. Hybrid method of teaching is a _____

- Combination of online and classroom meetings
- Strictly online setting
- Strictly classroom setting

29. The two skillsets that are measured in the comparison of students are _____

- Psychomotor
- Affective
- Both
- Neither



CLEC 2018 Poster and Tech Demo Quiz

Abstract 15

Donald Lehman, EdD, MLS(ASCP)^{CM}, SM(NRCM)

University of Delaware
Newark, DE

With the growing emphasis on molecular biology assays in medical science, it is critical that students learn the principles and procedures of these assays. However, teaching these methods in a hands-on laboratory can be cost prohibitive. In forensic science, DNA profiling utilizes the polymerase chain reaction of short tandem repeats. To introduce students, many of whom do not have a strong science background, in an introductory forensic science course to this relatively complex topic a laboratory simulation was developed. The free, online virtual site Second Life was used to simulate a laboratory environment. Students represent themselves with avatars and work in teams to complete the DNA analysis. In the simulation, students interact with laboratory instruments answering questions about the procedures. For example, they must know what solutions to use and the correct volume, which instruments to use, and what parameters to use on the instruments. After successfully completing the simulation, students receive results that they must analyze in a written report. In course evaluations, students found the simulation helpful. To the statement, "After participating in the Second Life crime scene assignment, I increased my knowledge about how to correctly implement the laboratory procedure to conduct a DNA profile on a blood sample," 34 of 54 students (63%) responded agree or strongly agree. The Second Life laboratory simulation is an effective method to introduce students to the polymerase chain reaction and could be adapted to other complex assays that require expensive instrumentation.

30. In the polymerase chain reaction (PCR) simulation in Second Life, students:

- Are represented by avatars.
- Can interact with each other in real time.
- Are asked specific questions about the PCR protocol
- All of the above.

31. In the polymerase chain reaction (PCR) simulation in Second Life:

- Real-time quantitative PCR assay is used to quantify DNA
- Variable-number tandem repeat analysis determines the DNA profile.
- Students need only to successfully complete the quantification of DNA step to receive the laboratory results.
- Students are assessed on their pipetting skills.



Post-baccalaureate Students in a University-based Medical Laboratory Science 2+2 Program Perform Better Overall on the American Society for Clinical Pathology Board of Certification Exam as Compared to First-time Undergraduates

*Laurianne T. Mullinax MS, MLS(ASCP)^{CM}

Heather M. Eggleston Med

Daniel D. Bankson PhD, DABCC

University of Washington

Seattle, WA

Background: Our Medical Laboratory Science (MLS) graduates have an American Society for Clinical Pathology (ASCP) Board of Certification Exam (BOC) passing rate that is higher than the national average. Nonetheless, we have graduates who do not pass the BOC. This loss of investment on both the part of the MLS graduate and the MLS program has inspired questions about our current candidate selection process.

Methods: We reviewed data from 178 MLS program students who graduated from our MLS program between 2010-2016. To evaluate the success of our candidate selection process related to student educational background we used BOC scores as the standard of student performance. We compared BOC scores for 3 types of enrolled students: post-baccalaureate (P, n=46), external transfer (T, n=43), and internal university (U, n=89). Data were analyzed using one-way analysis of variance with multiple comparisons.

Results: Mean \pm SD BOC scores for the 3 groups were P (592 \pm 76), T (536 \pm 78), and U (542 \pm 86). The PB BOC mean score was significantly elevated compared to the other two groups at $p < 0.01$ with no BOC failures (0/46, 0%). The other two groups were not significantly different from each other and both had similar BOC failure rates (T=2/43, 4.7%; U=4/89, 4.5%).

Conclusion: Post-baccalaureate MLS students graduating from our university program perform significantly better on the ASCP BOC Exam. This finding will be considered during our next application cycle and when marketing to potential program candidates.

32. What student performance metric was used to evaluate the success of the candidate selection process?

- Incoming program grade point average
- ASCP Board of Certification Exam
- Final program grade point average
- Grade point averages in didactic courses

33. Which group of students had the best performance on the ASCP BOC?

- University students
- Transfer students
- Post-baccalaureate students
- All students had equal performance



CLEC 2018 Poster and Tech Demo Quiz

Abstract 18

Laboratory Competency Guidelines to Strengthen Clinical Laboratory Science Training and Education

****Renee Ned-Sykes, PhD
Centers for Disease Control and Prevention
Atlanta, GA***

***Susanne N. Zanto, MPH, MLS(ASCP)CM, SM
Laboratory SolutionZ LLC
Helena, MT***

***Catherine Johnson, MA, MT(ASCP)
Association of Public Health Laboratories
Silver Spring, MD***

Clinical and public health laboratories have similar needs toward maintaining a well-trained and skilled workforce. The CDC/APHL *Competency Guidelines for Public Health Laboratory Professionals* (May 2015) can be applied broadly and are intended to form the foundation of approaches to improving quality and strengthening laboratory workforces. The Guidelines define the knowledge, skills, and abilities needed to successfully perform work functions across 15 areas of laboratory practice, including training itself. The Guidelines present the opportunity to identify competencies recommended for students and laboratory professionals as well as address gaps in current education, training, and professional development programs. At CDC, the Guidelines are informing the development of laboratory training courses and developmental programs such as the Laboratory Leadership Service. An APHL survey fielded in February-March 2017 to 439 MLS and MLT program directors showed that, overall, 5% of the 130 respondents were previously aware of the Competency Guidelines, 35% would be interested in possibly integrating them into their programs, and 50% were undecided about integration due to unfamiliarity with them. To improve

awareness and understanding, APHL and CDC have developed tools to aid in incorporation of the Guidelines into workforce development practices, including the assessment of staff performance and training needs. The Guidelines can complement existing competencies developed by educational institutions for internal use as well as resources such as the ASCLS Body of Knowledge and Entry Level Curriculum, thus serving as a framework for developing effective training and other capacity-building initiatives for the public health and clinical laboratory workforce.

34. Which of the following statements is true about the CDC/APHL Competency Guidelines for Public Health Laboratory Professionals?

- Competencies are defined across 3 levels of experience: Beginner, Mid-level, and Expert.
- The Guidelines were developed specifically for scientists working in public health laboratories and are not applicable to scientists working in other settings.
- Quality Management System (QMS) is the foundational domain in the Guidelines, underscoring the importance of quality to laboratory science and practice.
- The Guidelines are intended for use primarily in the training of current laboratory professionals.

35. The CDC/APHL Competency Guidelines for Public Health Laboratory Professionals have so far been implemented in the following ways except:

- Forming the basis for training needs assessments within laboratories.
- Integration into MLT and MLS clinical laboratory degree programs.
- Serving as the competency foundation for experiential training programs such as the CDC Laboratory Leadership Service (LLS) Fellowship program.
- Identifying gaps in existing and planned training for laboratory organization staff.



CLEC 2018 Poster and Tech Demo Quiz

Abstract 19

Creation and Implementation of a Virtual Microbiology Procedure Manual

***Samantha Peterson MS MLS(ASCP)^{CM}**

Christopher Triske MS MLS(ASCP)^{CM}

Robert Porter MS MLS(ASCP)^{CM}

University of North Dakota

Grand Forks, ND

Complex protocols within the clinical microbiology laboratory can overwhelm students, resulting in both confusion and frustration. Many students find it extremely challenging to fully comprehend new microbiology techniques by solely reading and navigating through written procedures. Development of a comprehensive microbiology procedure manual, incorporating authentic bacterial images and video demonstrations for each procedure, has shown to be an invaluable student resource. The videos in the virtual procedure manual were implemented into a 2-week accelerated microbiology lecture/laboratory course of 71 students. Videos were captured using iPad technology and a web-link to each video was distributed to students for easy access. Implementation of online videos in the student laboratory saved time by eliminating many live demonstrations and decreased the number of clarification questions asked by students. Student survey results indicated that 94% of respondents found demonstration videos helpful in preparing them to perform a new procedure, and 83.3% of respondents indicated willingness to watch a video demonstration procedure before a laboratory session. Data supports that implementation of a comprehensive virtual procedure manual can positively impact a wide range of pupils, including visual and auditory learners, and serve as an additional tool in accelerated educational environments. Comprehensive virtual procedure manuals may be applied to other procedure-heavy laboratory courses, such as immunohematology, and could enhance the experience of online learners who are unable to physically take a laboratory course.

36. According to the poster presentation, which of the following was considered a benefit of implementing a virtual microbiology procedure manual?

- students finished laboratory sessions faster
- time saved in the laboratory session by eliminating live demonstrations
- fewer faculty members required in the laboratory
- less time required for laboratory set-up

37. Which types of courses might benefit the most from the implementation of a virtual procedure manual?

- accelerated laboratory courses
- procedure-heavy laboratory courses
- on-line laboratory courses
- all of the above



CLEC 2018 Poster and Tech Demo Quiz

Abstract 21

How Statistical Basic Templates Aid in Teaching Clinical Laboratory Statistics

***David S. Plaut, B.A.**
Plano, TX

Nathalie Lepage, PhD
Children's Hospital of Eastern Ontario
Canada

Statistics is a topic rarely taught in a practicing and thorough way in MLS (medical laboratory scientist) classrooms. Statistics can be difficult and time consuming. Professors need materials and teaching tools. We can aid, if not solve, many of the difficulties mentioned with several Microsoft Excel templates (e.g.) assessing linearity, method validation and quality control that are easy to can practice statistics instead of memorizing concepts. With a laptop and the Microsoft Excel easily used programs (The student enters only data. The template does the math.) introduce and teach many statistics they need in their works. As they insert their own data into the template, students learn how changing number modify the outcome in a data set and in a graphic (We call this "What if?"). Critical thinking skills are developed as students dig deeper into the relationships between 'plain' numbers and understand what they really mean. As students grow in their knowledge of statistics, they will be able to use logic and reasoning when interrelating with numbers in the laboratory. These templates have been tested in a MS program at Rutgers University and at Children's Hospital in of Eastern Ontario Canada. The accept was interested and said to be significant helpful in class and at work. Their suggestions were helpful to us to make the templates better

38. How does the student use the templates?

- Add data to the template and then add formula(s) to the template.
- Adds various formulas to the template to find the best formula.
- Adds various formulas to find the best result.
- Add data to the template and view the result.

39. What is the best reason for the templates for students and teachers?

- The students and teachers don't know the formulas needed.
- The templates enable students and teacher to have examples of data that are not easily otherwise available.
- The templates make it possible to study a variety of statistic tests to find the 'best' one(s) for each analyte.
- The templates are easy to use.



Abstract 22

Incorporating an Interprofessional Education Emergency Medicine Simulation into Medical Laboratory Science Curriculum

***Kari Potter, MS MLS(ASCP)^{CM}**

Angela MacCabe, DPT

Barbara Stolle, MSN

Melissa Castillo MSPAS PA-C

Nicole Higgins MSPAS PA-C

Alycia Brantz-Miller, NR-Paramedic BAS

University of South Dakota

Vermillion, South Dakota

Interprofessional education (IPE) is an important component of the USD School of Health Sciences' mission. Incorporating IPE events into current Medical Laboratory Science (MLS) curriculum is imperative but challenging. MLS, physical therapy, paramedic, physician assistant, and nursing faculty developed an interprofessional emergency medicine simulation. The case involved transferring a patient with an adverse event during rehabilitation services via the paramedic training ambulance to the simulated emergency room for diagnosis and treatment.

Interdepartmental collaboration was imperative to coordinate the event. Faculty met monthly to develop a case which fulfilled each program's learning objectives. The event was scheduled to ensure all students had acquired the necessary skills and knowledge for successful participation. Evaluation tools were chosen to collect data regarding the participants' experience. The IPE emergency simulation event included 87 students from 5 programs. The primary goal was use of communication skills to safely transfer a patient between providers. Data was collected using the TeamSTEPPS observation tool and Teamwork Attitudes Questionnaire, and self-reflections to gauge student learning, application of TeamSTEPPS tools, teamwork, and perspective of the event. Preliminary analysis revealed a significant change in the MLS student understanding of the importance of communication (see table below). Comments from those involved were positive. IPE simulations enhance student learning as they utilize critical thinking, practice patient safety, and demonstrate collaborative problem-based learning. Outlining steps and considerations for implementation can assist healthcare programs in creating interprofessional opportunities for students to learn with, about, and from each other, ultimately strengthening collaborative patient centered care.

Table 1: Difference Pre- and Post- Survey Results	Program	N	Mean	S.D.
Total difference with all pre- and post- survey questions combined	MLS	12	6.42	9.219
	PT	28	5.75	7.749
	PA	22	1.36	7.014
#4. Patients are a critical component of the care team. <i>*ANOVA significant difference; Post-Hoc significant difference between MLS & PT; MLS & PA</i>	MLS	12	0.33	6.51
	PT	28	-0.11	0.497
	PA	22	-0.13	0.351
#10. Leaders should create informal opportunities for team members to share information. <i>ANOVA significant difference; Post-Hoc significant difference between MLS & PT; MLS & PA</i>	MLS	12	0.83	0.835
	PT	28	0.18	0.476
	PA	22	0.09	0.294

40. Interprofessional Education is gaining traction as a means to better prepare students for their future healthcare careers. Which of the following would be classified as an interprofessional event?

- An event involving at least two professions which stimulates learning about, from and with each other, and was planned by at least one representative from each of the involved professions
- An event that involves at least two professions and includes a simulation exercise
- A simulation planned by one department that invites two other professions to participate after it has been trialed
- A simulation involving three professions which is developed by a member from each of the professions, but all three professions work independently from each other during the simulation

41. The MLS students' role in this IPE simulation was to:

- Perform a CBC, differential, blood type and crossmatch
- Perform a venipuncture, type and crossmatch, urinalysis, and communicate critical results to the primary care provider
- Perform a CMP, CBC, and relay critical results to the primary care provider
- Perform a venipuncture, urinalysis, CMP, and CBC



CLEC 2018 Poster and Tech Demo Quiz

Abstract 23

Assessment of a Novel Method for Teaching Clinical Parasitology & Mycology

Li Qian, MD, MLS(ASCP)^{CM}

It has been a challenge for instructors and students in parasitology & mycology education because of their complicated life cycles and morphologies. There is evidence showing that student-centered teaching can improve learning outcomes. The objective of this project was to assess how the new teaching method would affect the student's learning result. A innovative student-centered and web-based method of teaching parasitology & mycology was launched in the spring semester of 2017. The students were provided with web-based resources including parasite life cycles, mycology morphology, etc. Then, the instructor would summarize the topic to highlight the learning points based on course objectives. Finally, the students chose their own styles to do the review projects for each topic. A questionnaire was used to evaluate the students' opinions on this new teaching method. Their final grades were analyzed using an Analysis of Covariance (ANCOVA) to compare 2016 and 2017 test scores for each spring semester. The dependent variable was parasitology & mycology scores and microbiology score would serve as a covariant to compare the test results. The microbiology class was taught with the traditional method by the same instructor; hence it could be used as the covariant to adjust for students' base level academic difference before they entered the class. All data were calculated on the IBM SPSS statistics version 24 (2016). Students showed clear preference for the new teaching method (93.8%). The student scores in parasitology & mycology were significantly higher in 2017 as compare to 2016 ($P < 0.05$). Therefore, it can be concluded that this web-based, student-centered teaching method may be used to enhance student learning in parasitology & mycology.

42. The purpose of the study is:

- To assess the efficacy of a new teaching method.
- To improve the student's learning outcome.
- To teach an Analysis of Covariance.
- Both a and b

43. What is the new method for teaching parasitology and mycology?

- Instructor teaches the topic based on the course objective only
- An Analysis of Covariance (ANCONA)
- Student-centered and web-based
- Teach students how to do research about parasitology and mycology



Incorporating Interprofessional Education to Distance Curricula through Online Simulation: A Pilot Project

***Cherika Robertson, MEd, MLS(ASCP)^{CM}**

Lindsay Gilbert, MEd, MLS(ASCP)^{CM}

Catherine Smith, MEd, CT(ASCP)

Jason Key, MEd, MLS(ASCP)^{CM}

Amber Teigen, MMS

Kathryn Neill, PharmD

Mike Anders, PhD

Mari Davidson, PhD

Jill Johnson, PharmD

Tiffany Tassin, MS

University of Arkansas for Medical Sciences

Little Rock, AR

***Letycia Nunez-Argote, MPH, MLS(ASCP)^{CM}**

University of Kansas Medical Center

Kansas City, KS

Simulation is a vehicle to develop Interprofessional (IP) Education Collaboration. In a situation where hands-on simulation is not possible, especially with online and distance programs, learning may happen through observation, active participation in debriefing, and self-reflection. With the need to develop IP activities for the Laboratory Sciences distance track, an IP simulation was designed to immerse students in IP Education concepts by providing counseling regarding syphilis test results to a pregnant patient. Pre-readings were provided and IP student teams were assigned. Teams prepared before experiencing a standardized participant encounter. Following the encounter, teams participated in debriefing where they reflected on the team performance. Students completed pre- and post-activity evaluations of self-assessments of the learner's perceptions of IPE and the simulation, using a Likert scale. Students from pharmacy, genetic counseling, medical laboratory sciences, cytotechnology, physician assistant, and public health participated. Results from both face-to-face and online evaluations were compared. There was statistical significance between the pre- and post- assessment scores in simulation experiences ($p < 0.01$). When asked of their ability to "Learn with, from and about IP team members to enhance care" before the activity only 18% of participants strongly agreed with the statement. After the activity, 91% of participants strongly agreed with the statement. Students agreed the simulation was a valuable educational activity. This project provides an IP team learning activity in both face-to-face and online formats, which highlights the role of medical laboratory sciences in contributions to patient care-decision making and develops the IP communication skills of future health professionals.

44. What was the purpose of developing the online IPE syphilis simulation?

- To provide distance education learners with the opportunity to participate in an IPE simulation activity.
- To enhance the IPE online syphilis simulation experience.
- To reinforce student learning of the syphilis disease progression and treatment.
- To provide all health professions disciplines a face-to-face simulation experience.

45. How was the change in participants' perception of their abilities with different IPEC competencies measured in this project?

- Participant observation by trained facilitators.
- A pre- and post- activity participant evaluation using a marked semantic differential scale.
- A pre- and post- activity participant evaluation using a Likert Scale questionnaire.
- Structured interviews and focus groups with students and facilitators.



CLEC 2018 Poster and Tech Demo Quiz

Abstract 26

Virtual Reality (VR) and the Future of eLearning at CDC

***Joe Rothschild BA**
Kevin Clark, M.S.
Yescenia Wilkins, MPH
Danielle Daniely, Ph.D.

Centers for Disease Control and Prevention
Atlanta, GA

The Laboratory Training and Services Branch (LTSB) located within the CDC Division of Laboratory Systems (DLS) designs innovative, comprehensive, and convenient training programs to enhance the clinical and public health laboratory workforce. LTSB also manages a training laboratory that can accommodate 30 participants per training course. While these in-person trainings are well-received, additional modalities are desired to aid in timely diffusion of new practices and standards and address just-in-time training needs. Using multimedia-based e-learning and exploring the integration of cutting-edge technology such as virtual reality (VR), LTSB can expand training opportunities beyond the traditional training laboratory. DLS currently offers over 50 eLearning courses and over 80 in-person workshops a year. About 16,000 public health and clinical laboratory

professionals completed the eLearning courses in 2017. DLS LTSB's e-learning methodologies, as well as potential VR interfaces, allow for an increased amount of people trained, provide valuable tracking and result data, and offer laboratory professionals the chance to apply and improve their skills in a safe and controlled learning environment. By applying state-of-the-art training design and production, DLS' laboratory trainings will continue to help scientists stay current with the newest standards and technologies, learn evolving practices, and combat emerging threats to the public's health.

46. Utilizing virtual reality (VR) in distance education can enhance the training by:

- Increasing engagement
- Allowing user hand movements to be recorded and evaluated
- Providing an environment where laboratory professionals can improve their skills in a safe and controlled learning environment
- All of the above

47. Which of the following is NOT an obstacle to current training offerings?

- Competing priorities for funds
- Computers and the Internet
- Increased workload for qualified instructors
- Limited seats in hands-on workshops



CLEC 2018 Poster and Tech Demo Quiz

Abstract 27

Socially Accountable Practice: The Result of Inter-Professional Education and Community Service Learning

***Catherine Smith, M.Ed., CT(ASCP)^{CM}**
Lindsay Gilbert, M.Ed., MLS(ASCP)^{CM}
Cherika Robertson, M.Ed., MLS(ASCP)^{CM}
Jason Key, M.Ed., MLS(ASCP)^{CM}
Letycia Nunez-Argote, MPH, CPH, MLS(ASCP)^{CM}
Allison Wingfield, M.S.M.S., CT(ASCP)CMMB

University of Arkansas for Medical Sciences
Little Rock, Arkansas

Issue: Community health fairs and student run clinics are inter-professional community service-learning initiatives where students plan and deliver clinical and health services, with the assistance of licensed healthcare professionals. They provide opportunities for inter-professional education (IPE) and community service learning (CSL), thereby increasing social accountability. Laboratory Science students including; Cytotechnology and Medical Laboratory Science, participated in the UAMS student run clinic focusing on women's health; performing exams and clinical testing. Students also participated in two community health fairs providing glucose and cholesterol testing and health education. Method: A qualitative study was designed to evaluate student perceptions of community service learning opportunities utilizing inter-professional teams and social accountability. Participants were students of the Medical Laboratory Science and Cytotechnology professional programs. Post-surveys were completed for data collection. Outcomes: Survey response rate was 85%. 100% of students indicated that the experience in inter-professional teams will help them be a more effective member of a healthcare team in the future. Student's perceptions indicated increased self-confidence (100%) and an increase in analytical skills (85%). 100% of the students strongly agree that the CSL experience positively influenced their attitude toward working with underserved patients. Conclusion: Collaborative practice settings such as student-run clinics and community health fairs have been identified as a key component for providing effective, socially accountable, patient-centered care and serves as a valuable tool and creative approach in the delivery of education that aims to foster socially accountable practice in the health professions.

48. What percent of survey participants felt that shared learning and working within an inter-professional team will help them be a more effective member of a healthcare team in the future?

- 25%
- 50%
- 75%
- 100%

49. According to the students, what was valuable about participating in the student-run clinic and community health fair?

- Increased knowledge of underserved patients
- Learning how to work in teams comprising of different health disciplines
- Understanding inter-professional teams are necessary to deliver quality healthcare
- All of the above



Taking Peer Teaching to the Next Level: Career Exploration Course Developed and Taught by MLS Students

***Dawn Taylor, EdM, MT(ASCP)
Caroline Doty, MS, MLS(ASCP)^{CM}**

**Oregon Institute of Technology / Oregon Health and Science University
Wilsonville, OR**

Teaching educational methodologies is a required curriculum element of NAACLS accredited MLS programs. Finding a meaningful way to allow students to demonstrate and practice their skills has been a challenge. To address this challenge, we launched a pilot project to provide MLS students the opportunity to teach a two-credit STEM career exploration course for high school students titled “Medical Detectives”. This course provides an opportunity to give high school students an experiential introduction to the MLS profession. MLS students were responsible for both designing and teaching this course. The educational methodologies that were designed and implemented by the MLS students in this course included; lecture, discussion, group learning activities, collaborative laboratory modules and flipped classroom coursework. The primary goal of this pilot program was for the MLS students to learn and apply the principles of course design and delivery. The secondary goal of this program was for high school students to learn about the MLS profession, career opportunities and our MLS program. Successful achievement of these goals were determined by course evaluations and a MLS student survey. Results from high school student course evaluations showed 80% of the students reported interest in the field as mildly to very interested after taking the course. Results from the MLS student survey showed 100% of students felt that they had gained substantial to exceptional progress towards applying educational methodologies. Based on these assessments, the program has met our initial goals and we plan to improve and expand the project.

50. How did MLS students tie information together to provide a cohesive learning experience throughout the four learning modules?

- Weekly small group discussions were utilized.
- All modules referenced a single case study.
- Clear learning objectives were developed for each module.
- Implementation of flipped classroom coursework.

51. Based on MLS student survey results, which learning objective showed the least progress made towards mastery of that skill?

- Apply educational methodology
- Work as a team
- Design a learn module
- Develop a student performance assessment method



CLEC 2018 Poster and Tech Demo Quiz

Abstract 30

Influence of Instructors' Attitudes, Gender, and Technology Training when Implementing Blended Learning

Consuelo Villalon, PhD, MT(AMT)

**Texas Southmost College
Brownsville, TX**

Instructors who lack experience with technology might encounter difficulties implementing the blended learning method. The instructors' attitudes toward implementing the blended learning method may differ according to their degree of knowledge in technology. The purpose of this quantitative study was to determine the relationships between instructors' attitudes toward implementing blended learning and instructors' self-reported hours of technology training in blended learning and differences in attitudes toward blended learning by gender. A sample of 33 participants who taught blended learning completed the modified survey. Descriptive and inferential statistics were used to analyze the collected data. The findings demonstrated the relationship between instructors' degree of technology training and the use of multimedia resources was statistically significant, $r = 0.45$, $p = 0.01$, 2-tailed. The study found the relationship between instructors' degree of technology training and the instructor/facilitator knowledge related to communication in learning activities, instructions, threaded discussions, and email was statistically significant, $r = 0.36$, $p = 0.05$, 2-tailed. Further, the study found no statistically significant difference in attitudes toward implementing blended learning held by male and female instructors. Moreover, the study found no statistically significant difference in instructors' self-reported degree of technology training for blended learning held by male and female instructors. The study concluded the importance of systematic technology training, instructor's expertise with technology, and knowledge of course content for the implementation of the blended learning courses. Future studies could have a greater number of instructors teaching blended learning to enhance the

generalizability of research findings.

52. What type of study is described in the abstract?

- Qualitative
- Phenological
- Case Study
- Quantitative

53. How do you explain the p value in a Pearson correlation?

- Strength of the correlation
- Significance value
- Difference of the means
- Homogeneity of variance



CLEC 2018 Poster and Tech Demo Quiz

Abstract 31

Selection of the Primary Quality Control Rules Based on Total Allowable Error and Total Error (by hand or laptop)

David S. Plaut, B.A.
Plano, TX

Julie Laramie, MS, MLS(ASCP)^{CM}SM
Minneapolis, MN

Nathalie Lepage Ph.D.
Children's Hospital of Eastern Ontario
Ontario, Canada

Choosing QC rules for monitoring quantitative methods is compulsory and often frustrating and not easy. Part of these protocol there are many possible QC statistical 'rules' (e.g. rejecting a single value outside 2 SDs) to be selected. Each analyte should use the rule(s) that have the fewest accepted wrong results (for patients and controls. Selecting the best primary QC rule to ensure that we have developed a simple, rapid system that calculates the rule best primary for each level used by for an analyte, our algorism uses three readily available data points for each QC level – the lab's

mean and SD, the true (survey) mean. With these data plus the TEa the program calculates the values for the TE and (TEa-TE). This algorithm generates the primary QC rule (e.g. 1 2.0 SD, 2.5 SD, 1 3SD rule). The rules -1 2.5 or 1 3 SDs (and ones between if wanted) will reduce wrong results without accepting false results. Additionally, QC rules such as 4 1 SD and 10 SD are no longer necessary. The 2 2 SD rule need not be rejected but needed only a aware. Using the algorithm by hand or in a lap top is easy, and removes the guesswork of choosing the primary QC rules.

54. Which one of these four lists does not have three data points for the QC rule algorithm?

- Lab's mean, Lab's SD, and TEa
- Lab's TE, CLIA TEa, and Survey's SD
- Lab's TE, Lab's Mean, and Survey's Mean
- Lab's Mean, Lab's SD and Survey Mean

55. Which of these has the best goal for QC rules?

- Fewest False Rejects of controls and patients
- Fewest False Rejects of Control and fewest False Accept of patient's results
- Fewest False Accepts of both controls and patient's results
- Most Accepted True control results



CLEC 2018 Poster and Tech Demo Quiz

Please evaluate the quiz

Objectives:

- Define the purposes of the research or projects presented in the poster or technology demonstration.
- Discuss the outcomes presented in the poster presentation or technology demonstration.
- Identify new teaching methodologies described in the poster presentation or technology demonstration.

56. Please evaluate the CLEC Poster and Technology Demo Quiz

	5=Yes/Excellent/High	4	3	2	1=No/Low/Poor
Rate the speaker(s) in terms of knowledge, organization and effectiveness.	<input type="radio"/>				
Rate how well the program met the stated/printed objectives.	<input type="radio"/>				
Rate your overall satisfaction with the program content.	<input type="radio"/>				
Rate the degree to which the content was presented without commercial bias.	<input type="radio"/>				

Comments