THE GEORGE WASHINGTON UNIVERSITY

## ABSTRACT

There are an estimated, "7 – 10 billion laboratory tests performed each year in the United States" and at least 70% of all medical decisions are made through the use of laboratory test results. However, there is currently a shortage in the laboratory workforce. This past year, the Laboratory Science profession was rated as one of the top one hundred jobs in healthcare by US News & World Report. Moreover, the Bureau of Labor Statistics estimates that the need for trained laboratory professionals will increase 22% from 2012 to 2022. Consequently, we developed an innovative summer program aimed at teaching young, STEM-oriented individuals about laboratory science, diagnostic medicine, and other health professions. This program was offered to local high school and community college students and included 6 hours of daily handson, interactive activities along with relevant instruction and foundational knowledge. To assess program success, a pre and post-test was implemented. Students achieved significantly (p < 0.05) higher scores on the post-test compared to the pre-test, indicating that they learned key information during the program. Furthermore, 90% of students felt that the program stimulated their interest in laboratory medicine and 99% felt that they were more knowledgeable about health science then they were before. The program, now in its third year, has successfully exposed the laboratory medicine and broader aspects of health care to the local population of future health care professionals, igniting interest, and afforded us an opportunity to provide outreach to the local community.

## METHODS

### **AIM ONE: DESIGN A ONE-WEEK MLS IMMERSION PROGRAM**

A team consisting of faculty and staff collaborated in developing and implementing MLS laboratory sessions. Focus was placed on creating hands-on exercises that mimicked real-world clinical practice so students could get the feel for what it was like working in the laboratory science field and practicing various techniques, including: WBC differentials, blood typing, bacterial gram staining, urinalysis, and agarose gel electrophoresis. Once the exercises were developed, the team created a schedule to fit the activities into a, intensive, one-week immersion experience. Supplies and reagents were ordered and the exercises were tested for functionality and for fitting within the allotted time schedule.

#### **AIM TWO: ASSESS EFFICACY OF THE IMMERSION PROGRAM**

Students were given a pre-test prior to attending the laboratory sessions to determine baseline knowledge. All students were given a post-test following the last laboratory session. The post-test contained the same questions as the pre-test in order to assess the amount of learning achieved after attending the program.

#### **AIM THREE: ASSESS STUDENT PERCEPTION**

Questions were developed to determine if the students felt that the laboratory sessions were helpful to their comprehension of laboratory medicine and diagnostic testing. Questions also covered whether the program stimulated their interest in diagnostic medicine and whether going through the program increased their learning of human disease. The survey, with answers based on a likert scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, or not applicable), was implemented in Google docs.

# **Exploring the Relationship Between Value Perception and Turnover Among Clinical Laboratory Scientists**

## LAB ACTIVITIES

SUMMER IMMERSION SCHEDULE						
	Day 1	Day 2	Day 3	Day 4	Day 5	
				Analysis of		
				biochemistry		
				results, BUN		
		White and Red Blood		analysis,		
		Cell Lecture and	Hematology	Hemoglobin	Agarose gel	
9:00 - 10:00	safety presentation	Demos	Lecture	analysis	electrophoresis	
	Pre-test, lab				DNA and PCR	
	overview, PPE hand-	Normal W/BC	AbnormalWBC		result analysis	
10:00 - 11:00	out	Differentials	Differentials and		using Gel doc	
			Cases			
11:00 - 12:00	Pipetting exercise			Blood Typing	Post-test	
12:00 -12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	
	Parasitology and			Molecular		
12:30 - 1:30	Mycology lecture	Macroscopic,	Bacteriology	Diagnostics		
	Parasite/Fungal	Chemical, and	Streak for Isolation/			
	Cases using	Microscopic	Gram Staining and			
1:30 - 2:30	Microscopes	Urinalysis	Spot Tests	DNA Extraction	Presentations and	
				Agarose Gel	Exit Survey	
			Discuss Group	Loading and		
	Blood Donation and	Urine Confirmatory	Case Projects and	Polymerase Chain		
2:30 - 3:30	Blood pressure	Testing	Hand out cases	Reaction		
Ish		Irinalycic				



Lab Activity: Microbiology



Lab Activity: Molecular Diagnostics



	Comparison
70%	
60%	
50%	
40%	
30%	
20%	
10%	
0% └	

### **Student Perception**

The program provided a safe

I know more lab techniques summer immersion program I know more about diagnost

the summer immersion prog The program has stimulated about diagnostic medicine

Overall satisfaction with the program

The instructors were knowle that they led

The program provided a vari building activities



- perception survey.
- future health care professionals.
- program.

### RESULTS

### of Pre-Test and Post-Test Scores



Average Score (%)

n Survey Questions	% Strongly Agree or Agree (N=166)
e environment	99.2%
than I did before the	95.4%
ic medicine than I did before gram	96.3%
my interest in learning more	84.2%
summer immersion	94.2%
edgeable in the subject area	96.28%
iety of learning and skill	95.55%

### CONCLUSIONS

• The program enhanced student comprehension of the medical laboratory science concepts covered in the program as indicated by the pre- and post-test scores and the student

• The program successfully ignited interest and exposed laboratory medicine and broader aspects of health care to

• Most students know more about the laboratory science profession and the technical skills required to work in the lab than they did prior to attending the program.

• Overall, almost 95% of students were satisfied with the