Challenges of Medical Laboratory Science and Medical Laboratory Technology Program Directors

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ABSTRACT

Concerns facing the directors of NAACLS accredited Medical Laboratory Science (MLS) and Medical Laboratory Technology (MLT) programs were investigated. A survey of 26 questions was sent using SurveyMonkey® to program directors of 441 NAACLS accredited MLS and MLT programs throughout the United States. The survey included questions on recruitment, enrollment, retention, faculty, budget, clinical affiliation, research and scholarly activity. Demographic information related to the program type and location was also included. Data from 242 (54.8%) respondents revealed that enrollment has increased or remained the same in 212 (87.6%) of the programs. For both MLS and MLT programs with concerns about recruitment, these were most often related to lack of knowledge about the profession 77 (31.8%). Only 37(15.3%) of the programs had a designated recruiter and only 68 (28.1%) had a marketing plan. Concerns related to clinical placements were reported by 189 (78.1%) of the respondents. The program director was the only full time faculty member in 81 (33.5%) of the programs; 129 (53.3%) reported securing faculty is a concern. Chi-square analysis revealed program dependent concerns with recruitment, retention, budget, faculty, and clinical affiliation. Logistic regression analysis revealed program dependent concerns with recruitment, retention, budget, faculty, and clinical affiliation. Identification of these concerns is an important step for program directors to identify options and to create successful program strategies.

Table of Contents

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"It's never too late to be what you might have been" ~ G. Eliot.

CHAPTER ONE

Introduction and Statement of the Problem

In Chapter One the contents of this research study are outlined along with a discussion of the issues and concerns of the Program Directors of Medical Laboratory Scientist MLS/CLS and Medical Laboratory Technician MLT/CLT degree training programs. For the purpose of this paper, MLS represents the designation of MLS, CLS and MT which is the four-year baccalaureate degree; MLT represents the designation of MLT and CLT which is the two-year associate degree. The components of Chapter One include the introduction, statement of the problem, purpose of the study, research question, and limitations of the study.

Introduction

The history and practice of Medical Laboratory Technology is one of the oldest of all the allied health professions. The first clinical laboratory was opened in 1896 at Johns Hopkins Hospital where physicians performed laboratory procedures themselves (Lindberg, Britt, & Fisher, 1984). The effects of World War I brought about the creation of a wide variety of laboratory training programs to meet the critical need for qualified staff to perform laboratory procedures (Delwiche, 2003). In 1922, the American Society of Clinical Pathologists (ASCP) was formed. In 1928 ASCP created the Board of Registry (BOR) to certify individual laboratory technicians and to bring about standardization to the education of laboratory personnel (Delwiche, 2003). The majority of "medical technology schools" were housed in hospitals and the laboratory workforce

received, what is now considered “on the job training”. In the late 1960’s as technology advanced and test complexity increased, a growing need emerged for a more formalized educational approach with coursework based in the sciences as well as clinical training. Congress passed the “Allied Health Training Act” which resulted in federal funding for programs that had at least three allied health programs, enrolled a minimum of 20 students, and granted an associate degree. This began the emergence of colleges and schools of allied health in the academic setting (NAACLS, 1999).

Statement of the Problem

This study investigates issues and concerns of program directors of Medical Laboratory Scientist (MLS) and Medical Laboratory Technician (MLT) degree programs. According to ASCP, the world’s largest professional membership organization and credentialing agency for pathologists and laboratory professionals, the medical laboratory profession is currently facing a shortage of qualified MLS and MLT. The U.S. Department of Labor projects that 15,000 laboratory professionals will be needed each year and this shortage is projected to be an issue into the future since on average 5,000 graduate from accredited schools annually (ASCP, 2012). One of the target areas to address this shortage is the clinical laboratory training program. In addition to the MLS and MLT degrees, some programs are entry level Master of Science degrees. These programs can be offered through a university, community college, technical school, or proprietary school. There are hospital based programs as well. There are rigorous academic standards set in place from the National Accrediting Agency for Clinical Laboratory Science (NAACLS), the international agency for accreditation and approval

of education programs in the medical laboratory sciences. These standards must be met in order for the program to meet accreditation requirements.

A literature review was performed that brought to light several issues that the MLS and MLT program is facing. There is concern for the number of educational training programs that create the new graduates. According to ASCP the number of NAACLS accredited Medical Laboratory Science/Medical Technology programs have dropped from 709 in 1975 to 219 in 2009, resulting in approximately 50 percent fewer graduates (ASCP, 2012). Forty percent of NAACLS accredited MLS programs have closed (Simpson, 2009).

There are other challenges that the program directors face such as a general lack of knowledge and low visibility of the laboratory profession in the community, which does not lead to medical technology as a choice for a program of study when students are selecting a major. This has an effect on recruitment. Without an active recruitment or marketing plan these programs tend to not see an increase in their student enrollment (NAACLS, 1999).

The enrollment and retention of students is a noted area of concern as well. The U.S. Department of Health and Human Services (DHHS) in its report on the Clinical Laboratory Workforce reported that educational programs expressed concerns about the declining number and quality of applicants to clinical laboratory science programs. The report also indicated that retention is a concern among those surveyed (DHHS, 2005).

The fiscal operation of MLS and MLT programs was another area of concern in the DHHS report. MLS and MLT programs have high expenses along with small class size. University and college administrators may view this as "fiscally unjustifiable".

There is the challenge of having adequate numbers of qualified and trained faculty and professors to train the students in the programs. Faculty are reaching retirement age and the question is whether or not there will be qualified MLS and MLT with the required education to fill the need so programs can remain operational. If there is no-one to educate the future graduates, the programs suffer (Rogoski, 2010).

The decrease in availability of clinical sites which are crucial to the training of the students is another concern. Program directors may need to seek alternatives to the clinical rotation so that the student may gain proper competency. This may stress an already minimally staffed laboratory who may agree to take on another student for clinical training, or the student may be forced to be on a clinical waiting list, which will delay their graduation.

Purpose of the Study

The purpose of this study was to provide insight to the concerns faced by program directors of NAACLS accredited MLS and MLT programs. This may assist program directors in the identification of issues to better address operational needs for future success of their programs. In order to measure the participants concerns and perceived challenges, the researcher utilized non-experimental survey research. To test the

feasibility of the research, a pilot study was developed based from information gathered by literature review. The pilot study consisted of 20 questions that collected data from program directors of NAACLS accredited MLS and MLT programs in the state of Ohio. The survey asked questions regarding recruitment, enrollment, clinical affiliation, faculty, and budget. The pilot study indicated that concerns related to clinical affiliation and faculty were significant. There were no significant concerns with recruitment, enrollment, or budget. The results of the pilot study which are discussed in Chapter Three have provided information for the basis of the research question, hypothesis, and development of the questions of the survey instrument. The survey instrument, consisting of 26 questions obtained data to examine the challenges of the program directors. The data was collected through a survey of program directors of NAACLS accredited MLS and MLT programs throughout the United States.

Research Questions

This study will answer the research question related to the concerns and issues faced by program directors:

What are the major concerns of MLS and MLT program directors?

Research Hypothesis

The research question has led to the following null and alternate hypothesis.

H_o: Availability of clinical sites and qualified faculty are not statistically significant concerns of NAACLS accredited MLS and MLT program directors.

H_a: Availability of clinical sites and qualified faculty are statistically significant concerns of NAACLS accredited MLS and MLT program directors.

Significance of the Study

NAACLS accredited MLS and MLT programs are one route for the educational requirement for entry level qualification in the profession. The results of this study may provide additional insight to the issues and concerns that program directors experience. This may help the program directors evaluate the needs of their program when considering future strategies to ensure program success.

Limitations of the Present Study

The survey was sent to programs that were operational at the time of the dissemination of the survey instrument. Closed programs were unavailable for analysis; therefore, the study was unable to research reasons for program closure.

Ethical Considerations

To ensure that this research was conducted in an ethical manner, all policies and procedures as outlined by the Youngstown State University Institutional Review Board (YSU-IRB) were followed. The YSU-IRB determined that the research protocol met the criteria for minimal risk survey research. A copy of the YSU-IRB Letter of Exemption is included in Appendix A of the study.

Summary

This chapter presents an introduction to the study. The research may assist program directors by providing a comprehensive overview of issues and concerns that are presently faced.

Chapter Two provides an overview of the current literature that provided the basis of the pilot study and supports the purpose of the research. Chapter Three explains the methodology used for the research and Chapter Four describes the results of the study. Chapter Five provides discussion of results, limitations, and recommendations for future research and conclusions.

CHAPTER TWO

Review of Literature

Introduction

The purpose of this study was to provide insight to the concerns faced by program directors of NAACLS accredited MLS and MLT programs. The study was intended to identify possible challenges faced by program directors in keeping programs operational. The results of this study may assist program directors to identify issues and better address operational needs for future program success. This chapter will present a review of the literature that examines areas of research that pertains to MLS/MLT program directors and their program. The first section of the review addresses concerns related to recruitment, enrollment, and retention of students. The second section of the review will examine issues regarding internal operation of the programs and will discuss research related to budgets, faculty, clinical affiliation, and research and scholarly activity.

Overview of the MLS/MLT Program

Medical laboratory technology is one of the oldest of the allied health professions. Medical laboratory scientists (MLS) and medical laboratory technicians (MLT) are highly educated, requiring either a bachelor's (MLS) or associate's degree (MLT). In addition to academic coursework, clinical rotation at a clinical site is required. There is concern for the number of educational training programs that create new graduates (ASCP, 2012).

With this insight from the brief overview of the MLS /MLT programs, the following sections will discuss the existing literature that pertains to the MLS /MLT program directors and their program.

Body of the Review

Section One

Recruitment. In a study by Stuart (2003) it was stated that there is a workforce shortage in the MLS profession. This shortage and its well documented reasons are mainly out of the hands of program directors. The one factor that program directors may have influence over is student recruitment on campuses. The recruitment of qualified and interested students can increase the pool of program applicants, but there was no clear understanding of the reasons why a student applied to the MLS program. An understanding to the reasons why could assist future efforts in recruitment. A study was conducted to investigate what factors motivated a student to enroll in the University of Utah Medical Laboratory Science Program.

This qualitative study took place at the University of Utah in 2001. Phase 1 participants were junior level MLS students. There were a total of seven participants. Five were age less than 30, one participant was aged between 30-40, and one participant was over the age of 45. Five of the participants were female and 2 were male. One participant had a previous associate's degree and one had a Bachelor of Science degree. The student participants were given individual interviews that included open ended questions pertaining to the reasons that the students chose the University of Utah MLS

Program. The interview took place over 2 ½ weeks. Once the individual interviews were complete, one focus group interview of all participants was held to expand on any information obtained in the initial individual interviews.

The interview data was analyzed for patterns of words or phrases that were commonly used throughout the interviews. Open coding using Microsoft Excel, (Microsoft, Redmond, WA) was used. Words and phrases were coded and then categorized into themes so that broad and specific motivations were identified.

In the conclusion of the Phase 1 part of the research, three themes emerged. The first theme was "influential people", which identified the persons who helped influence the student's decision to apply. They were identified as college advisors, MLS faculty and program advisors. The second theme of "program characteristics" that were influential was the geographical location as well as the association of the university with a school of medicine. The third theme was "job characteristics" which included opportunity for employment, MLS job duties being investigative in nature, as well as altruistic qualities of the profession. In addition to these findings it was mentioned that in recruitment there was an emphasis on the programs affiliation with two specific laboratories in the region: Associated Regional and University Pathologists, Inc. (ARUP), and Intermountain Health Care (IHC). The preliminary results provide a basic understanding of why students chose the program as well as strategies for recruitment that can better increase student enrollment.

In Phase 2 of the research, the pilot study was expanded. The Phase 2 study participants were junior and senior ranked students enrolled in randomly selected NAACLS accredited university based MLS programs throughout the United States. Four-hundred seventy eight surveys were sent; of that 274 (57%) responded of which 40% were from the western half of the United States. The survey utilized in Phase 1 was modified to include demographic information, perceptions, desirability of the MLS profession, and profession resources. The data was collected and analyzed using SPSS (SPSS, Inc., Chicago, IL). Descriptive statistics were used to categorize responses into four categories: program choice, influential people, profession qualities and information resources. This categorization attempted to answer the research question, "What motivates a student to apply to the University of Utah MLS Program?"

The demographic information indicated that of the 274 respondents 200 (73%) were female and 74 (27%) male. This information reflects the disproportionate make-up of women to men in the profession. Two-hundred (73%) of the respondents were age 20-25 and 74 (27%) were over age 26. One hundred twenty-one (44%) were junior rank, 132 (48%) were seniors, and 21 (8%) were pursuing advanced degrees. Seventy-one (26%) learned about the MLS program their sophomore year, and 69 (25%) learned about the program their freshman year. Item descriptors in the 4 categories: program choice, influential people, MLS profession quality, and information sources. Categories were ranked by survey participants with "1" being the most important factor and "2" being the second most important. The results in the category of "Program Choice" was defined as geographic location, reputation of program and professional qualities; 26% stated that

geographic location and 23% ranked reputation as being most important. For the category of "Influential People", defined as those persons that helped the student learn about the MLS program, 30% ranked family and friends being the most influential followed by 21% college advisor, and 17% MLS advisor. In the third category of "Profession Qualities", 27% stated that the program was a "stepping stone" to other professions. It was not reported what the other professions were. Twenty four percent ranked job security, and 21% listed job flexibility as most important. Lastly, in the fourth category "Information Sources", 25% listed college advisor, 16 % stated family and friends, 14% listed program brochures, and 12 % stated the information came from a college catalogue.

Based on Stuart's study at the University of Utah the following conclusions can be made. Program choice is often based on location. Students may choose a program based on its proximity to home. Recruitment, marketing, and advertising should be directed towards those who reside in a particular region first. The category of "Information Sources" could align itself with the "Influential People" categorization since both categories identified college advisors as important. College advisors should be made aware of the program and be updated with any program changes. By providing program information to these individuals, there is an awareness of the program on the campus. This will assist potential students who are interested since the information will be available to refer them to the program director. Information about the program could also be made available to high-school guidance counselors, as they could be an information source to students. The professional qualities of the MLS profession could be marketed

and promoted. The “detective nature” of the work performed in the field may be of interest to students who are interested in healthcare. The use of the program as a “stepping stone” to other professions is vague and further research could be conducted as to what the student’s educational plans are. There are some limitations in the study as well. Information gathered in this study only targeted university students in a 4 year MLS program. Research could be expanded to the 2 year MLT programs at universities as well other educational settings to see what the differences are between the groups. All of this information brings about a better idea as to the influences on students and may help with future recruitment strategies (Stuart 2003).

To study recruitment strategies used to increase enrollment in the Medical Technology (MT) Program at the University of Delaware (UD), the faculty implemented activities in an attempt to increase enrollment or face closure. The MT program at UD is a 2+2 program accredited for a total of 26 students. Due to declining enrollment, increased operational costs, and financial difficulties it was decided by university administrators that the program was to be eliminated. The faculty of the MT program at UD sought to develop and implement recruitment strategies which would increase enrollment and help convince university administration to keep the program operational. Although it is an older resource, the study by Lehman, Wilson, Ciulla, and Hingston (1995) documents what strategies were developed and used by the MT program faculty and the outcomes of such measures.

It was determined that recruitment for the MT program at UD should focus on three groups: junior and senior high school students, undeclared majors, biology majors who were enrolled in the College of Arts and Science, and what is considered "non-traditional" students. High school recruitment initiatives included a video that described the laboratory profession as well as a slide show highlighting the UD program and scripts used for a demonstration for interactive experiments that were able to be performed in the classroom. This was sent to teachers in Delaware, Maryland, New Jersey, and Pennsylvania. In addition to these activities a day was set aside for those who applied to UD and had expressed interest in the program. The interested applicants could receive a tour and meet the faculty, alumni, and current students. Other recruitment activities focused on minority student recruitment, health awareness programs, and continuing education workshops for high school educators in southern Delaware (Lehman, Wilson, et al. 1995). High school guidance counselors received information about medical laboratory science and articles were written for state science teacher journals.

Recruitment activities for the current students at UD focused on freshmen with undeclared majors and biology majors who were enrolled in the College of Arts and Science. The activities that focused on these groups were the placement of bulletin boards and brochures in common areas of the medical laboratory science facility. These items contained information and visual aids that gave an overview of faculty, curriculum, the profession, scholarships, and career opportunities. The boards were accompanied by brochures that were made readily available. An open-house was held in the fall with another open-house in the spring during National Medical Laboratory Week. The spring

open-house featured a panel discussion with current MT students. Freshman, sophomore, and all biology majors in the College of Arts and Science were personally invited. The open-house was advertised campus wide.

The non-traditional students were selected from recent UD Bachelor of Arts degree in biology. These groups were targeted because biology graduates are historically unable to find employment in the biological sciences and some may have been unsuccessful with admission to medical or professional school. This group received a brochure by mail that described the need for laboratory professionals, the average salary, and what courses would be required to complete the degree. The recruitment of those that are also considered "non-traditional" is the MLS and MLT who were not currently practicing. It was stated that these individuals may need courses to refresh themselves. It could also assist those with either a certificate or associate degree who wish to obtain a bachelor's degree.

There were additional activities involved to attract students. A scholarship fund was established with the assistance of alumni, university employees, physicians, and corporations. It was hoped that the scholarship would attract those interested who may be in need to apply to the program. Area hospitals that offered educational assistance to its employees were made available. The program also had an exhibit board made to be used at career fairs and health fairs.

The results of these activities were immediate. It was stated that in that year student enrollment doubled from 10 students to 24. The diversity of the group was also noted. Two students held MLT associate degrees, three held a Bachelor of Arts in biology from UD, and two had Bachelor of Science degrees. Current enrollment at time of the study was 25 students in the senior class, 26 in the junior class, and 40 in the sophomore class. A survey was administered to help determine the recruitment effectiveness to the junior MT class and to the introductory MT class. The survey results indicated that 46 (67%) of the current students first learned about the program on the UD campus, 22 (32%) learned about the program from a friend or family member, and 2 (3%) from a high school guidance counselor. This shows the need to include and inform high school guidance counselors of the program and profession. Having a presence on campus has been successful as well. Efforts to maintain the recruitment of students was necessary for the survival of the MT Program at UD.

Enrollment. To help determine what factors influenced a student with their choice of major; McClure (2009) conducted a study that used exploratory discovery and inductive logic to assess student attitudes and perceptions of the clinical laboratory science profession among college students at select universities. The study took place at three metropolitan university campuses in the state of Texas. There were a total of 56 participants that comprised six focus groups that consisted of junior and senior level students currently enrolled in MLS /MLT programs and junior and senior level biology students. The students were given a standard set of questions that focused on their perception about a career in clinical laboratory science. The students were given general

topics that pertained to appeal of the profession, entry level skills, impression about the career, and what factors or incentives might be useful in attracting individuals to the profession (McClure, 2009). After analysis of the transcripts from the focus group discussions it was determined that the most frequent response pertaining to the questions about "impressions about career" were cited as the lack of knowledge about the profession from other health care workers and the general public. It was also noted that the MLS/MLT students felt that they received a lack of respect from physicians as well as nurses, but felt that they were an integral part of the healthcare team. However 75% of the MLS/MLT students felt that there was no opportunity for growth or advancement. Students also felt that salary was not commensurate with the knowledge required. A majority of both groups (85%) stated that it was important to build a strong bond between yourself and your job and both believed that they would have no difficulty finding employment as a MLS/MLT. Many believed they would secure a job prior to graduation (McClure). The group participants believed that funding in the form of grants and scholarships and programs such as loan forgiveness would be the best incentive to attract students into the MLS/MLT program since the majority of the students work to pay for their education. Included in this theme was the statement that in order to attract more students, the profession also needs to attend and present at high school career fairs. There was a difference in perception between the two groups in regards to their idea of "job element". Biology students reported that the important "job element" for them was "work environment" and the MLS/MLT students stated "salary". Biology students share similar perceptions about the clinical laboratory profession therefore reaching out to them could

have the potential to increase enrollment in the MLS/MLT programs at universities (McClure, 2009).

Retention. In addition to concerns with student recruitment, program directors may also face retention concerns. It has been suggested by the Committee on Allied Health Education and Accreditation (CAHEA) that studies be conducted to address student attrition (as cited by Laudicina, 1995). As this is an older study it should be mentioned that CAHEA accreditation preceded NAACLS accreditation. As far back as 1992, a study performed by Gupta (as cited by Laudicina, 1995) showed attrition rates varying from 7-21%. Reducing attrition in MLS and MLT programs is an important step to maintaining or increasing enrollment numbers in the programs. Laudicina (1995) attempted to document retention methods that are in use by MLS and MLT programs to assess if there are methods aimed at improving retention, which methods work, and if there are any differences in methods between MLS and MLT programs. The sample was sent to the program directors of 338 CAHEA-accredited MLS and MLT programs throughout the United States. Both two-year associate degree and four-year degree programs were studied. The program directors were given a 52 item survey that asked questions pertaining to phases of retention models proposed by Billson and Terry (1987) which is based on the premise that student involvement and student support will reduce attrition. This model can be applied by higher education institutions for retention efforts. Billson and Terry's model has eight phases which are considered important to the student retention process: outreach, recruitment, assessment, preparation, orientation, integration, maintenance, and separation. In this study Laudicina attempted to document current

retention efforts of MLS and MLT programs with Billson and Terry's model as the means to classify the retention methods currently in use (Laudicina, 1995).

The program directors were sent the survey instrument and asked to respond anonymously but to include program enrollment data from the 1992 CAHEA Annual Report. A total of 182 (54%) surveys were received. One hundred (55%) were MLT programs, 66 (36%) were MLS programs and the program level was unknown for 16 (10%). Enrollment data was submitted by 137 (75%) of the 182 respondents. The results were analyzed by using SPSS (SPSS, Inc., Chicago, IL) using descriptive statistics, the frequencies were calculated for both MLS and MLT programs as well as individually. The use of each individual retention method by the MLS and MLT program level was analyzed using a one-way analysis of variance (ANOVA). The program scores were assigned to one of the eight phases of retention and a total score was calculated for each phase. The eight phases of the retention model were compared for frequency of use. The programs were scored on their use of the eight retention phases. Comparisons were then made between the MLS and MLT programs by using one-way ANOVA to see if any differences existed. The enrollment data that was submitted was used to calculate any attrition rate. Laudicina found that 182 (100%) of the respondents reported use of retention methods. Of the 52 methods listed on the survey instrument, the frequency of use ranged from 16 (31%) to 48 (92%), with the mean number of methods used is 28.9 (58%). Analysis of the individual retention methods showed that some were used with low frequency (3.3%) to a high of (97.3%). Laudicina stated that the frequency of use for individual retention methods varied by program level on 19 of the 52 methods. Thirty-six

percent of respondents have an official retention plan in place. It was noted by Laudicina that the MLT programs use assessment and preparation more frequently than MLS programs, and that MLS programs use recruitment and selection more frequently than MLT programs. The results for which methods were used by the MLT programs were with greatest frequency; maintenance, separation, assessment, preparation, and integration. Out-reach and orientation were both used equally and recruitment had that least use. The results for the MLS programs were; maintenance, separation, recruitment, integration, assessment, outreach, orientation, and preparation. The method used with the most frequency by both MLS and MLT programs is maintenance. This maintenance phase covers a broad range of activities where the student has highest involvement in their academic success. It can be concluded from the frequency of use, all of the methods for retention are being utilized although which phase the emphasis in on varies with the program as well as to what degree retention is needed. The differences between the MLS and MLT programs may be attributed to program location and student population, but the overall use of retention methods by MLS and MLT programs indicates that there is awareness by program directors as to the need to help retain students in their programs (Laudicina, 1995).

NAACLS has addressed student retention in its 2009 *Program Revitalization: Strategies for Survival* report. The report is intended to offer information to assist MLS and MLT programs in their efforts to remain operational. NAACLS has provided in this document a strategy checklist to target student retention. It is stated by Swail (2006) that retention begins with a clear focus on the student. Being responsive to the student is also

a clear directive from NAACLS. When addressing retention issues program directors could start with a review of their admission criteria. Recruitment should occur with the best interest of the student in mind not just enrollment numbers. Knowing who the student is could prove beneficial and lead to success in the MLS or MLT program. Support should be given to the student throughout the program so attrition is minimized. It is recommended that the student be counseled from the start and throughout the program (Swail, 2006).

Section Two

Program budgets. According to the DHHS *Clinical Laboratory Workforce Report* the expense of operating a MLS or MLT program is an area of concern and the cost must be justified. State funding is decreasing while the institutional costs are steadily rising. Historically MLS/MLT programs are costly to operate and have low enrollment numbers. This combination makes the MLS program a focus of potential closure when financial pressures force a university to make spending cuts. A study by Rudmann (1995) was to investigate the perception of university based MLS program directors about their program and assess what strategies and approaches they have implemented so that they may keep their programs operational. The study was sent to 19 program directors of CAHEA accredited university based MLS programs in the state of Ohio and bordering states. The survey instrument consisted of 4 questions. The questions focused on whether or not the program was experiencing budget cut-backs, what budget categories were the cut-backs in, was there intentional enrollment decreases, and if the perception of potential program closure existed. They were also questioned on what approach has been

implemented to assist with the budget cutbacks. A total of 13 (68%) program directors responded. Of the respondents, 62% reported that their program structure was a 2+2 program, 23% were a 3+1 program, 8% were a 4+1 program, and 8% categorized their program as "other". The results stated that over three academic years, 8 (66%) of the respondents indicated that their program had been faced with budget cut-backs. It was then reported that the categories of budget cuts were to faculty full time equivalents (FTE) 17.8%, staff FTE 10%, and operating budget 8.7%. One program had intentionally decreased enrollment. Program closure was a potential concern that was mentioned by 33% of program directors, but 100% reported that they felt that program elimination was unlikely in the next three years. For strategies and approaches that were reported as successful, 31% used part-time faculty and graduate assistant instructors, 30% implemented the successful use of alternate teaching, 15% restructured the curriculum and 46% secured donations from alumni and other sources such as industry.

Based on the above research, it can be concluded that when faced with budget cuts, faculty and staff FTE's are affected first. This reduction in staffing is offset by the use of less costly part-time instructors, graduate assistants, and staff. Rudmann (1995) has concluded the results indicate that program directors understand they must continually evaluate their programs to identify what strategies work and what can better assist them in the future to remain operational (Rudman, 1995).

Program budgets and director responsibility. A key informant interview was conducted with Joseph Mistovich, Chairperson and Professor in the Department of Health

Professions at Youngstown State University (YSU) in Youngstown, Ohio. YSU is an urban research university located in Northeast Ohio that has 12,227 students enrolled as of fall 2014. The Department of Health Professions has twelve different allied health programs that are offered. The clinical laboratory technology program offers either MLT associates degree or MLS bachelor's degree. The interview was conducted to gain perspective in regards to the funding, operational budget, and faculty for the department and in particular the clinical laboratory program at YSU. Mr. Mistovich stated that overall the funding that the department receives is on par with the operational needs of the programs. He stated that in his 19 years as chair, there has not been a budget increase, yet the department remains operational. He attributes this to the college fees, laboratory fees, and technical fees that are part of tuition. The college fee is allocated to the programs as discretionary spending. Allocation of discretionary spending is decided by "who needs it the most". He stated that the state of Ohio has made cuts to the capital equipment program so if equipment is needed, the funds will come out of the "college fee". Budget is based on student enrollment. It was mentioned that enrollment in some programs is stable, yet some of the other programs are tied to the economy, especially the two-year associate degree programs. Any budget cuts that need to be made, the specific categories will be looked at on a case by case basis and the determination will be made should the need arise. When questioned specifically about the clinical laboratory program, he feels that "outside exposure" as well as "early exposure" by high school students may have an impact on the enrollment numbers, which helps the program remain operational. When questioned about faculty issues, he feels that the department is in a very good position. He stated that the department has positioned itself very well with its

full-time and part-time teaching staff. He mentioned that with the budget constraints that all of higher education is facing, having part-time faculty enables the department to do more. The use of part-time faculty is a benefit to the students as well, in that the department is able to have what is considered "expertise from the field". He feels that this is a "win-win" for the department, and especially the students. Mr. Mistovich was then questioned about program director responsibility. He stated that the demands on the program directors are overwhelming. He feels that there are too many requirements placed on the director that diverts their time from teaching to administrative duties. The requirements are stemming from institutional demands due in part from institutional cut-backs to the support departments. These additional responsibilities take the director away from the academic setting and they are now involved in activities that they previously were never involved in before (J. Mistovich, personal communication, November 26, 2014).

Issues related to faculty. Rogoski (2010) stated that there is still an ongoing concern for securing qualified faculty in MLT programs. The American Society for Clinical Laboratory Science (ASCLS) has acknowledged that the major challenge at least where MLT programs are concerned is faculty recruitment (as cited by Rogoski, 2010). The majority of qualified faculty is reaching retirement age and those that are considered the best recruitments to teach are still too inexperienced or are lacking either a master's degree or doctorate degree. The additional requirements of teaching are often a deterrent as well. In addition to classroom instruction, faculty are required to grade papers, prepare lectures, counsel students, perform administrative duties as well as fulfill any research

requirements. Romig, O'Sullivam-Maillet and Denmark (2011) in their comprehensive literature review regarding allied health faculty job satisfaction reported that junior faculty report heavy workloads, tenure anxiety, and a desire for guidance from colleagues. Other concerns that persist within allied health academia are low salaries and difficulty finding faculty with advanced degrees and proper training for the academic setting. The Association of Schools of Allied Health Professions (ASAHP) has also stated that schools of allied health have issues with "restricted resources for instruction and research, less federal funding, shortages of doctorial faculty, an aging professoriate, low research productivity, and salary disparities with the practice world" (Romig, et al, 2011, p. 10-11).

Difficulties related to clinical affiliation. According to Madsen-Myers (2007) in an article published by NAACLS there are challenges faced by program directors in regards to clinical affiliation and agreements. As stated by Madsen-Myers (2007) programs are required meet accreditation standards to remain operational but clinical sites are requiring the use of their institution's agreement in place of the program's agreement. Clinical sites which may be part of a larger hospital system may want to use a standardized agreement that covers a broad range of health professions in lieu of the MLS or MLT program agreement. These standardized agreements may be difficult to alter to better assure the clinical experience that is required to produce a consistent educational experience for the student. Program directors are struggling with the adequacy of clinical sites for their students. Having to negotiate an agreement in place of a standardized one may be problematic especially in the situation where NAACLS standards are omitted and new

language is appearing. This new language is in regards to the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule and Joint Commission on Accreditation of Healthcare Organizations (JCHAO) requirements. Both HIPPA and JCAHO address liability, not meeting the standards required in affiliation agreements that are required for accreditation. Standardized affiliate agreements are becoming problematic since they do not contain the specifics that are required by NAACLS. It has also been stated that the agreements contain requirements that are not applicable to the clinical laboratory and do not include statements in regard to student safety. When this occurs any negotiation is difficult and program directors are often times faced with either dropping the clinical affiliate or negotiating an agreement which presents its own challenges when program review deadlines approach which affect program accreditation. When faced with a negotiation the contact person at the site is often not of a clinical laboratory background and is unfamiliar with the needs of the MLS/MLT students. This makes negotiation difficult since understanding the needs of the student may take time so an agreement can be reached. In conclusion, program directors have the responsibility to ensure that the educational needs of the student are met according to standards set in place by NAACLS. By having a standardized clinical affiliation agreement from the clinical site and not from the MLS or MLT program creates a potential of not meeting NAACLS standards (Madsen-Myers, 2007).

In another study that focused on clinical affiliation, Romig, O'Sullivan-Maillet, Chute, and McLaughlin (2013) stated that the decrease in availability of clinical affiliate sites is a concern. The clinical affiliate site is crucial to the training of the students. When

there is decreased availability, program directors may need to seek alternatives to the clinical rotation so that the student may gain proper competency. One alternative is to make a request that another clinical affiliate take on an additional student for training. This may stress an already minimally staffed laboratory. If there are no alternatives the student may be placed on a clinical waiting list, which will delay their graduation. In addition to the availability of clinical affiliate sites there is also the challenge of securing qualified faculty/professors to train the students in the programs. Many faculty members are reaching retirement age and the question is whether or not there will be qualified MLS/MLT with the education to fill the need so programs can remain operational (Rogoski, 2010).

Summary

The review of the literature has summarized some of the existing literature on the topic of this study. The current literature indicates that there is an awareness of the issues that directors of MLS and MLT programs face. As a result of the literature review, seven issues became apparent. These issues were recruitment, enrollment, retention, budgets, faculty, clinical affiliation and research/scholarly activity. These items were the focus of a pilot study and the results of the pilot study guided this research. This study will contribute to the existing research literature by providing a comprehensive analysis of issues facing program directors of all operational NAACLS accredited MLS and MLT programs.

CHAPTER THREE

Methods

Introduction

The purpose of this study was to provide insight to the concerns faced by program directors of NAACLS accredited MLS and MLT programs. The following research question was addressed: *What are the major concerns of MLS and MLT program directors?* The study was intended to identify possible challenges faced by program directors in keeping their programs operational. This research design is a non-experimental quantitative study. The results of this study may assist program directors to identify issues and better address operational needs for future program success. Chapter Three will begin with a brief overview of the methods and results of the pilot study.

Pilot Study

The pilot study was approved by the Youngstown State University Institutional Review Board (YSU-IRB). The study was conducted over a period of three weeks in July, 2014. The survey instrument was designed using the survey software SurveyMonkey®. The survey consisted of 20 questions that collected data from program directors of NAACLS accredited MLS and MLT programs in the state of Ohio. The survey was sent via SurveyMonkey® to the emails of the Ohio program directors in July, 2014. The survey asked questions regarding recruitment, enrollment, clinical affiliation, faculty and budget. The pilot study indicated that the significant concerns were related to clinical affiliation and faculty. The results showed that 58% of program directors had

concerns regarding clinical affiliation. Twenty-five percent of program directors were the only full-time faculty and 42% had one other faculty member. There were no significant concerns with recruitment, enrollment, or budget as only 23% of program directors reported concerns with recruitment, 42% had an increase in enrollment, 58% reported that enrollment has remained the same, and 67% reported having adequate budgets.

Measurement Instrument

The researcher-made survey *Challenges of MLS and MLT Program Directors* was designed using the survey software SurveyMonkey®. After responses were analyzed from the pilot study, minor revisions were made to the pilot survey instrument. The pilot survey was revised for clarity and ease of response. None of the items of concern selected for the pilot were excluded in this survey however questions were added to collect demographic information. The 26 question instrument was created to collect data on perceived challenges regarding recruitment, enrollment, retention, budget, faculty, clinical affiliation, and research and scholarly activity. Although multiple questions were asked in each variable category, not all collected information will be applied for this research. Demographic information was collected as to program type, setting, and years of operation. The survey was conducted via computer with internet access. The responses were collected and analyzed by SurveyMonkey®. Reports were downloaded directly from SurveyMonkey® into Statistical Package for the Social Sciences (SPSS) spreadsheets for further analysis.

Sample/Participants

A survey instrument was developed and then approved by the Youngstown State University Institutional Review Board (YSU-IRB). The sampling procedure used by the researcher was non-random purposive sampling. The participants were selected based on their positions as program directors. Participants were from the NAACLS database for MLS and MLT programs throughout the United States.

Setting

The survey instrument was sent to 441 program directors of NAACLS accredited MLS and MLT programs in the United States. A multiple question survey was distributed via email which included a brief description as well as informed written consent to be completed prior to the completion of the questionnaire. The survey addressed issues in recruitment, enrollment, retention, budget, faculty, adequacy of clinical sites, and research and scholarly activity.

Data Collection

The survey was sent to emails of the program directors via SurveyMonkey® in September 2014. The researcher verified that there were completed surveys on SurveyMonkey®. A reminder email was sent in October 2014 to encourage those who did not complete the survey. A second reminder was sent two weeks after the first reminder in late October 2014. An electronic copy of the thesis was offered to those who responded, along with a copy of the published study as incentive to respond to the survey. The survey was closed two weeks after the second request for responses. Data was

collected and analyzed via SurveyMonkey®. Reports were produced with descriptive results that were downloaded into SPSS version 22.0 (Armonk, NY, 2013) for analysis.

Data Analysis

Results from the survey were analyzed descriptively. SurveyMonkey® provided immediate access to the results. The results in SurveyMonkey® provided the actual number of respondents, percentages and bar graphs. The researcher reviewed all collective responses. Before further analysis could be performed, it was necessary to recode the all of the responses into a 'yes' or 'no' outcome. This allowed for compatibility with the statistical methods. The binary dependent variable, "*Are the responsibilities placed on you as a director a challenge?*" was recoded into two categories: (0) No, not a concern; (1) Yes, a concern. The categorical independent variables addressed in the study are whether or not there is a concern with the following: *recruitment, enrollment, retention, budget, faculty, clinical affiliation, and research and scholarly activity.* These variables were also recoded as: (0) No, not a concern; (1) Yes, a concern. Two of the survey questions; "*Currently do you have adequate clinical sites for your students*", and "*Do you have requirements for research and scholarly activity at your institution that are difficult to complete*" were designed with the option to select one of multiple reasons for the concern. This resulted in the need to aggregate the responses for the two questions into the recoded response.

Descriptive Statistics Analysis. A descriptive statistics analysis was performed on this research. The statistical data examined consisted of data from the following seven variables: 1) *recruitment*, 2) *enrollment*, 3) *retention*, 4) *budget*, 5*) faculty,* 6*) clinical*

affiliation, and 7) *research and scholarly activity*. SPSS was used to generate frequencies, percentages, and cross-tabulation of the independent variables to describe the population and responses.

Inferential Statistics Analysis. A chi-square test for independence was used to test the significance of the association of between each independent variable and the dependent variable to determine whether or not the two categorical variables are dependent. Logistic regression analysis then was performed to predict the relationship between each categorical independent variable on the binary dependent variable. A model was constructed using MLS and MLT programs combined. In addition, to see differences between programs, models were constructed and analyzed on MLS and MLT programs separately. In order to run the statistical analysis, the locations of technical school and proprietary school were aggregated into community college location.

Since not all respondents answered all 26 questions in the survey, the incomplete surveys were not included in results.

Summary

This chapter describes the pilot study, setting, participants, and methodologies utilized in this study for data analysis. The methods are designed to address overall concerns of program directors with additional analysis by program type to compare the existence of any differences between MLS and MLT programs. In Chapter Four the

findings of the data analysis will be presented with Chapter Five offering final discussion, limitations, recommendations for future research, and conclusion.

CHAPTER FOUR

Results

Introduction

Chapter Four presents the results of the current study to identify the concerns of MLS and MLT program directors. Demographic information is presented to describe the sample. The results from a chi-square test of independence are also presented and followed by the results from logistic regression analysis.

Research Hypothesis

The research question "*What are the major concerns of MLS and MLT program directors?"* has led to the following null and alternate hypothesis.

H_o*: Availability of clinical sites and qualified faculty are not statistically significant concerns of NAACLS accredited MLT and MLS program directors.*

H_a*: Availability of clinical sites and qualified faculty are statistically significant concerns of NAACLS accredited MLT and MLS program directors.*

Review of Methodology

The research design is a non-experimental quantitative study. The survey instrument *Challenges of MLS and MLT Program Directors* was sent to 441 program directors of NAACLS accredited MLS and MLT programs through-out the United States. The 26 question survey instrument collected data on recruitment, enrollment, retention, budget, faculty, clinical affiliation, and research and scholarly activity. Demographic

information collected included program type, setting, and years of operation. Reports were downloaded directly from SurveyMonkey® into SPSS version 22.0 for analysis. Descriptive statistics were used to identify the demographics of the sample. A chi-square test for independence was used to test the significance of the association between each categorical independent variable and dependent variable of study. Logistic regression was then performed to predict the relationship between each categorical independent variable on the binary dependent variable. The assumed logistic regression formula which explains the relationships between the dependent and independent variables and is shown below:

$$logit\ P(X) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7$$

In this equation the dependent variable $P(X)$ is *the responsibilities placed on the program director are a challenge.* The independent variable X_1 is the observation of *recruitment*, where X_2 is the observation of independent variable *enrollment,* X_3 is independent variable *retention*, X_4 is independent variable *budget,* X_5 is independent variable *faculty,* X_6 is independent variable *clinical affiliation*, and X_7 is independent variable *research/scholarly activity*. In the formula, the constants $\beta_1$through β_7 represent beta coefficients. The constant *a* represents the y-intercept of the model.

Descriptive Statistics of the Sample

Demographic data. The data obtained from the survey *Challenges of MLS and MLT Program Directors* was analyzed using the statistical package SPSS for this research. The variables that were studied are listed in Table 1.

Table 1

Variable Definitions (N =242 respondents)

Variable	Definition
Recruitment	The activities that refer to the process of attracting students into the MLS/MLT program.
Enrollment	The number of students currently attending classes in the MLS/MLT programs.
Retention	The process of retaining those students enrolled in the MLS/MLT program through completion.
Budget	The amount of money allocated for operational expenses on the MLS/MLT program.
Faculty	Teaching staff for the program.
Clinical Affiliation	An agreement between the MLS/MLT program and an outside clinical setting. The clinical affiliate provides learning environment for the student.
Research/Scholarly Activity	Is defined as participation in activities concerned with academic research.

Source: *Challenges of MLS and MLT Program Directors.*

The relevant demographic data from the sample survey showed that of the 242 program directors who responded, 117 (48.3%) were directors of MLS programs and 125 (51.7%) were directors of MLT programs. Demographic distribution of the respondents for program type and location is listed in Table 2.

Table 2

Distribution of Program Type and Location (N=242)

Program Location	Program Type		% Program Location
	MLS	MLT	
University	72	13	35.1
Hospital	42	3	18.6
Community College*	3	109	46.3
Total	117	125	100.0

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Recruitment. Recruitment concerns varied based on program locations and is summarized in Table 3. Data for the MLS programs shows that of those 72 programs located in the university, 35 (48.6%) reported recruitment concerns; of the 42 hospital based programs, 17 (40.5%) reported recruitment concerns; and of the 3 community college based programs all 3 (100%) reported recruitment concerns. Data for the MLT programs showed that of the 13 programs located in the university, 12 (92.3%) reported recruitment concerns. Of the 3 hospital based programs there are no reported concerns with recruitment, and of the 109 community college based programs, 73 (67.0%) reported recruitment concerns. Results from all 242 program directors indicated that overall, 140 (57.9%) of program directors have concerns with student recruitment with the highest frequency of programs with recruitment issues being reported by community colleges 76 (67.9%), followed by 47 (55.3%) of programs located in the university setting. Additionally, results from all 242 program directors indicated that 77 (31.8%) attributed

issues in recruitment to a lack of knowledge about medical laboratory programs and when asked whether or not their programs have a designated recruiter, 205 (84.7%) reported their program had none.

Table 3

Recruitment concerns by program type and location.

Program Location	Program with recruitment concerns			
	MLS	%	MLT	%
University	35	48.6	12	92.3
Hospital	17	40.5	0	0.0
Community College*	3	100.0	73	67.0

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Enrollment. Program directors were asked about enrollment concerns in their programs over the past 5 years. The results indicated that of the overall sample, 109 (45%) had increased enrollment and 103 (42.6%) indicated that enrollment has remained the same. A decrease in enrollment was reported by 30 (12.4%) of program directors. Of the programs who reported an increase in enrollment, 61 (55.9%) attributed this to biology and chemistry graduates seeking a viable career. The data for the programs that reported enrollment concerns is displayed in Table 4. Data for the MLS programs shows that of those 72 programs located in the university, 3 (4.2%) reported enrollment concerns; for the 42 hospital based programs, 5 (11.9%) reported enrollment concerns;

and of the 3 community college based programs, there were no reported concerns with enrollment. Data for the MLT programs shows that of those 13 programs located in the university, 3 (23.1%) reported enrollment concerns; the 3 hospital based programs had no reported concerns with enrollment; and of the 109 community college based programs, 19 (17.4%) reported concerns with enrollment.

Table 4

Enrollment concerns by program type and location.

Program Location	Program with enrollment concerns			
	MLS	%	MLT	%
University	3	4.2	3	23.1
Hospital	5	11.9	0	0.0
Community College*	0	0.0	19	17.4

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Retention. Retention issues are reported by 113 (46.7%) of respondents. Data for the MLS programs that reported concerns with retention reveals that of the 72 programs located in the university, 21 (29.2%) reported concerns with retention; of the 42 hospital based programs, 7 (16.7%) reported retention concerns; and of the 3 community college based programs, 1 (33.3%) reported concerns with retention. Data for the MLT programs reveals that of the 13 programs located in the university, 10 (76.9%) reported retention concerns; of the 3 hospital based programs, 1 (33.3%) reported retention concerns; and of

the 109 community college based programs, 73 (67.0%) reported retention concerns. These findings are displayed in Table 5. Overall the highest frequency of program directors with retention issues by location were reported by 74 (66.1%) of community colleges, followed by 31(36.5%) at the university setting.

Table 5

Retention concerns by program type and location.

Program Location	Program with retention concerns			
	MLS	%	MLT	%
University	21	29.2	10	76.9
Hospital	7	16.7	1	33.3
Community College*	1	33.3	73	67.0

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Budget. Overall 165 (68.2%) of program directors stated they felt their program budget was adequate. Data for the MLS programs revealed that of those 72 programs located in the university, 29 (40.3%) reported budget concerns; of the 42 hospital based programs, 10 (23.8%) reported budget concerns; and the 3 community college programs reported no concerns with budget. Data for the MLT programs showed that of those 13 programs located in the university, 5 (38.5%) reported budget concerns; none of the 3 hospital based programs reported budget concerns; and of the 109 community college programs, 33 (30.3%) reported budget concerns. This data is reported in Table 6.

Table 6

Budget concerns by program type and location.

Program Location	Program with budget concerns			
	MLS	%	MLT	%
University	29	40.3	5	38.5
Hospital	10	23.8	0	0.0
Community College*	0	0.0	33	30.3

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Faculty. When surveyed about faculty, 129 (53.3%) stated that securing faculty is a challenge. Eighty-one (33.5%) of program directors stated they had no other full time faculty member and 86 (35.5%) had one other full time faculty member. Regarding the number of part-time or adjunct faculty who assisted with instruction, 64 (26.4%) of the respondents reported none and 88 (36.4%) had up to 2 part-time faculty. Data for the MLS programs reveals that of the 72 programs located in the university, 51 (70.8%) reported concerns securing faculty; of the 42 hospital based programs, 14 (33.3%) reported faculty concerns; and of the 3 community college based programs, 2 (66.7%) reported concerns with securing faculty. Data for the MLT programs revealed that of the 13 programs located in the university, 11 (84.6%) reported concerns securing faculty; of the 3 hospital based programs, 2 (66.7%) reported concerns with securing faculty; and of the 109 community college based programs, 49 (45.0%) report concerns with securing faculty. This is reported in Table 7.

Table 7

Securing faculty by program type and location.

Program Location	Program with faculty concerns			
	MLS	%	MLT	%
University	51	70.8	11	84.6
Hospital	14	33.3	2	66.7
Community College*	2	66.7	49	45.0

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Clinical affiliation. Concerns with the adequacy of clinical affiliate sites was reported by 38 (32.5%) of MLS and 79 (63.2%) of MLT programs. Data for the MLS programs shows that of the 72 programs located in the university, 30 (41.7%) report concerns with the adequacy of clinical sites; of the 42 hospital based programs, 5 (11.9%) report concerns with the adequacy of clinical sites; and of the 3 community college based programs, 3 (100%) report concerns with the adequacy of clinical sites. Data for the MLT programs reveals that of the 13 university based programs, 10 (76.9%) report concerns with the adequacy of clinical sites; of the 3 hospital based programs, 1 (33.3%) report concerns with the adequacy of clinical sites; and of the 109 community college based programs, 68 (62.4%) report concerns with the adequacy of clinical sites. The data for the programs that report concerns with the adequacy of clinical sites is displayed in Table 8.

Table 8

Clinical affiliation concerns by program type and location.

Program Location	Program with clinical affiliation concerns			
	MLS	%	MLT	%
University	30	41.7	10	76.9
Hospital	5	11.9	1	33.3
Community College*	3	100.0	68	62.4

Source*: Challenges of MLS and MLT Program Directors.*
* Includes technical schools and proprietary schools.

Overall 133 (54.9%) of program directors state that placement is becoming a concern with 56 (23.1%) having to either use a waiting list or take less students into the program. Program directors were subsequently asked about alternatives used when clinical sites are not available, 59 (24.3%) requested that their clinical sites take an additional student, 15 (6.2%) adapted a student laboratory to supplement the training, 15 (6.2%) offered the internship during a different semester, 35 (14.5%) take less students into the program, and 79 (32.6%) stated that they implement a combination of the choices. Areas for training which are most problematic for placement include blood bank 15 (6.2%) and microbiology 38 (15.7%). The combination of blood bank/microbiology is the most troublesome to 104 (43.0%) of respondents. Table 9 shows alternatives used when clinical sites are not available.

Table 9

Alternatives for clinical affiliation sites by program.

	Program			
Alternative	MLS (*n=117*)	%	MLT (*n=125*)	%
Waiting list	6	5.1	15	12.0
Less students	11	9.4	24	19.2
Student lab	11	9.4	4	3.2
Different semester	3	2.6	12	9.6
Additional student at site	27	23.1	32	25.6
Combination of choices	24	20.5	55	44.0

Source*: Challenges of MLS and MLT Program Directors.*

Research/Scholarly Activity. Program directors were asked about their concerns with requirements for research and scholarly activity. Overall, 181 (74.8%) of the program directors stated that they had no research requirement, 47 (19.4%) had research requirements that are difficult to complete, and 14 (5.8%) responded that they had research requirements that they are able to complete. When the MLS and MLT program were analyzed separately, a difference was seen. Of the 117 MLS program directors, 40 (34.2%) stated that the requirement is difficult to complete, 12 (10.3%) stated that they are able to complete the requirement, and 65 (55.5%) reported that they have no research requirement. Of the 125 MLT program directors, 7 (5.6%) had a research requirement

that was difficult to complete, 2 (1.6%) had a research requirement that they were able to complete, with 116 (92.8%) reporting that they had no requirement for research. Table 10 displays this data.

Table 10

Research and scholarly activity requirements by program.

	Program			
Concern	MLS (*n=117*)	%	MLT (*n=125*)	%
Research requirement difficult to complete	40	34.2	7	5.6
Research requirement able to complete	12	10.3	2	1.6
No research requirement	65	55.5	116	92.8

Source*: Challenges of MLS and MLT Program Directors.*

Two-hundred (82.6%) stated that the responsibilities placed on them are a challenge. Overall, 155 (64%) stated their biggest concern was too many administrative assignments, 43 (17.8%) said securing qualified faculty was a challenge, 23 (9.5%) said program closure due to declining resources, 17 (7.0%) stated program closure due to declining enrollment, and 4 (1.7%) had no concerns at all. This is displayed in Table 11.

Table 11

Concerns with additional responsibility.

	Program			
Concern	MLS (*n=117*)	%	MLT (*n=125*)	%
Too many Assignments	76	65.0	79	63.2
Securing faculty	23	19.7	20	16.0
Declining resources/ closure	11	9.4	12	9.6
Declining enrollment/ closure	5	4.3	12	9.6
No concerns	2	1.7	2	1.6

Source*: Challenges of MLS and MLT Program Directors.*

A review of all of the variables of study with the programs reporting concerns is displayed in Table 12.

Table 12

Variables of study and percentage of programs reporting concerns.

	Program			
Variable	MLS (*n=117*)	%	MLT (*n=125*)	%
Recruitment	55	47.0	85	68.0
Enrollment	8	6.8	22	17.6
Retention	29	24.8	84	67.2
Budget	39	33.3	38	30.4
Faculty	67	57.3	62	49.6
Clinical affiliation	38	32.5	79	63.2
Research/ scholarly activity	40	34.2	7	5.6

Source*: Challenges of MLS and MLT Program Directors.*

Chi-square analysis

Chi-square analysis was used to test the significance of the association between each independent variable and dependent variable. The analysis was performed on data from MLS and MLT programs combined (*N =242*) to ascertain an overall picture of program director concerns. The results from the chi-square analysis showed that of the program directors that reported the responsibilities placed on them are a challenge are

more likely to report that recruitment $\chi^2 = 16.54$, ($p = 0.000$); retention $\chi^2 = 6.02$, ($p = 0.014$); budget $\chi2 = 4.95$, ($p = 0.026$); and faculty $\chi^2 = 7.28$, ($p = 0.007$) as being statistically significant concerns whereas enrollment, clinical affiliation, and research and scholarly activity are not. This is displayed in Table 13.

Table 13

Chi-square values of all NAACLS accredited program director concerns (N=242)

Variable	χ^2	df**	*p*
Recruitment	16.54	1	0.000*
Enrollment	0.00	1	0.966
Retention	6.02	1	0.014*
Budget	4.95	1	0.026*
Faculty	7.28	1	0 .007*
Clinical Affiliation	2.72	1	0.099
Research/ scholarly activity	0.28	1	0.598

* Statistical significance at $p \leq 0.05$. ** df, Degree of freedom.

Chi-square analysis was also performed separately on data from MLS and MLT programs to discover any significant differences that may not be accounted for when both programs are analyzed together. The results of chi-square analysis on the 117 MLS programs showed that of the program directors that report the responsibilities placed on

them are a challenge are more likely to report that recruitment $\chi^2 = 14.43$, ($p = 0.000$); retention $\chi^2 = 5.50$, ($p = 0.019$); and faculty $\chi^2 = 3.84$, ($p = 0.050$) are all statistically significant concerns whereas enrollment, budget, clinical affiliation, and research and scholarly activity are not. This is seen in Table 14.

Table 14

Chi-square values of MLS program director concerns (n=117)

Variable	χ^2	df*	*p*
Recruitment	14.43	1	0.000*
Enrollment	0.29	1	0.590
Retention	5.50	1	0.019*
Budget	1.05	1	0.307
Faculty	3.84	1	0.050*
Clinical Affiliation	0.03	1	0.860
Research/ scholarly activity	0.31	1	0.575

* Statistical significance at $p \leq 0.05$. ** df, Degree of freedom.

The results of chi-square analysis of the data from MLT programs resulted in different findings when compared to those of the MLS programs; these are shown in Table 15. Of the 125 MLT program directors that reported the responsibilities placed on them are a challenge are more likely to report that budget $\chi^2 = 4.68$, ($p = 0.030$); and clinical affiliation $\chi^2 = 3.97$, ($p = 0.046$) are statistically significant, whereas recruitment,

enrollment, retention, faculty, and research and scholarly activity are not statistically significant variables. It is noted that the independent variable *faculty* has a *p*-value of 0.056 and *recruitment* has a *p*-value of 0.060. Although these are not considered statistically significant, these findings may warrant future studies.

Table 15

Chi-square values of MLT program director concerns (n=125)

Variable	χ^2	df**	*p*
Recruitment	3.54	1	0.060
Enrollment	0.11	1	0.739
Retention	1.61	1	0.205
Budget	4.68	1	0.030*
Faculty	3.65	1	0.056
Clinical Affiliation	3.97	1	0.046*
Research/ scholarly activity	0.29	1	0.589

* Statistical significance at $p \leq 0.05$. ** df, Degree of freedom.

Logistic regression analysis

Logistic regression was the statistical method used for analyzing the data. This method of statistical analysis was chosen to predict the probability that the binary dependent variable, responsibilities placed on MLS and MLT program directors is either a challenge or not a challenge based on the 7 categorical independent variables that were analyzed for their effect on the dependent variable.

A logistic regression analysis was performed on the combined data from MLS and MLT programs. The regression statistics are shown in Table 16. Of the program directors responding that they have recruitment concerns ($\beta = 1.34$, $p = 0$ .001), they are 3.8 times more likely to have reported that the responsibilities placed on them are a concern than those who reported they have no concerns overall. Of the program directors reporting they have faculty concerns ($\beta = 0.96$, $p = 0.015$) they are 2.6 times more likely to have reported that the responsibilities placed on them are a concern than those who reported they have no concerns overall. Additionally, the independent variable *clinical affiliation* has a *p*-value of 0.053. Although this is not considered statistically significant, this finding may warrant additional research.

Table 16

Logistic regression model representing concerns of MLS and MLT program directors (N=242)

	β	SE	Wald	Exp (*B*)	*p*
Recruitment	1.340	0.419	10.24	3.819	0.001*
Enrollment	-0.283	0.579	0.239	0.754	0.625
Retention	0.274	0.420	0.427	1.316	0.514
Budget	0.763	0.468	2.658	2.145	0.103
Faculty	0.956	0.395	5.865	2.600	0.015*
Clinical Affiliation	1.052	0.544	3.736	2.863	0.053
Research/ scholarly activity	0.030	0.458	0.004	1.031	0.947

***** Statistical significance at $p \leq 0.05$.

Logistic regression analysis was also performed on MLS and MLT programs individually to identify any statistically significant differences that may not be accounted for when both programs are analyzed together. As in the chi-square analysis, the models were performed to account for any differences found between the program types. As shown in Table 17, the MLS program directors responded that they have recruitment concerns ($\beta = 2.43$, $p = 0.003$), are 11.4 times more likely to have reported that the responsibilities placed on them are a concern than those who reported they have no concerns overall. Program directors that responded that they have retention concerns ($\beta = 2.83$, $p = 0.034$) are 12 times more likely to have reported that the responsibilities

placed on them are a concern than those who reported they have no concerns overall. These results suggest that MLS program directors have a high probability of reporting recruitment and retention concerns over enrollment, budget, faculty, clinical affiliation and research and scholarly activity.

Table 17

Logistic regression model representing concerns of MLS program directors (n=117)

	β	SE	Wald	Exp (*B*)	*p*
Recruitment	2.433	0.812	8.986	11.40	0.003*
Enrollment	-1.180	1.056	1.249	0.307	0.264
Retention	2.483	1.172	4.486	11.97	0.034*
Budget	0.011	0.653	0.00	1.011	0.987
Faculty	0.942	0.583	2.609	2.566	0.106
Clinical Affiliation	-0.463	0.973	0.226	0.629	0.634
Research/ scholarly activity	-0.573	0.618	0.858	0.564	0.354

* Statistical significance at $p \leq 0.05$.

For the MLT programs (Table 18) program directors responded that they have budget concerns (β= 1.587, p = 0.050), are 4.9 times more likely to have reported that the responsibilities placed on them are a concern than those who reported they had no concerns overall. Program directors that responded that they have concerns with clinical

affiliation (β = 1.785, p = 0.012) are 6 times more likely to have reported that the responsibilities placed on them are a concern than those who reported they have no concerns overall. These results suggest that MLT program directors have a higher probability of reporting budget and clinical affiliation concerns over recruitment, enrollment, retention, faculty, and research and scholarly activity.

Table 18

Logistic regression model representing concerns of MLT program directors (n=125)

	β	SE	Wald	Exp (B)	p
Recruitment	0.954	0.640	2.224	2.596	0.136
Enrollment	0.289	0.801	0.130	1.335	0.718
Retention	0.127	0.609	0.043	1.135	0.835
Budget	1.587	0.811	3.828	4.889	0.050*
Faculty	1.129	0.600	3.541	3.092	0.060
Clinical Affiliation	1.785	0.713	6.265	5.958	0.012*
Research/ scholarly activity	0.330	1.161	0.081	1.391	0.776

* Statistical significance at $p \leq 0.05$.

Summary

This chapter concludes the data analysis of the study. The chapter provided an overview of the descriptive statistics, chi-square analysis, and logistic regression. Chapter Five will conclude the study with discussion of the findings, limitations of the study, and suggestions for future analysis.

CHAPTER FIVE

Discussion

Introduction

The summary includes an overview of the research problem, hypotheses, and methodology used to conduct the study. The summary is followed by a discussion of the results, limitations, recommendations for future research, and conclusion.

Research Summary

The purpose of this non-experimental quantitative study was to investigate and provide insight into the concerns and challenges of program directors of NAACLS accredited MLS and MLT programs and to identify issues to better address the operational needs of the programs. Based on the results of a pilot study the following research question was developed, "*What are the major concerns of MLS and MLT program directors?"* The research question has led to the following null and alternate hypothesis:

H_o: Availability of clinical sites and qualified faculty are not statistically significant concerns of NAACLS accredited MLT and MLS program directors.

H_a: Availability of clinical sites and qualified faculty are statistically significant concerns of NAACLS accredited MLT and MLS program directors.

To measure the participants' concerns and perceived challenges a survey instrument consisting of 26 questions obtained data to examine the concerns of the

program directors with their perceived causes. The data was collected through a survey of program directors of NAACLS accredited MLS and MLT programs throughout the United States.

Discussion of Results

Challenges of MLS and MLT Program Directors was designed to partially assess the issues and concerns that directors of NAACLS accredited MLS and MLT programs are facing in program operation. Insight into the issues and concerns that program directors are experiencing was illustrated by the results. Overall program director concerns were discovered along with concerns of MLS and MLT program directors individually. The descriptive statistics analysis provided demographic information which was necessary to analyze differences between MLS and MLT programs. Program location along with frequency, totals, and percentage for each variable were examined.

To test the association between each categorical independent and dependent variable, a chi-square test of independence was performed. This statistical method was used to determine if a relationship exists between each of the identified concerns and the dependent variable. The analysis of MLS and MLT programs overall indicated that recruitment, retention, budget, and faculty are statistically significant as perceived challenges to program directors, while enrollment, clinical affiliation, and research and scholarly activity were not. In addition to this, independent chi-square analysis of MLS programs led to the identification of recruitment, retention, and securing faculty as

statistically significant concerns. Chi-square analysis of MLT programs indicated that concerns with budget and clinical affiliation were statistically significant.

The significance and the effect that each categorical independent variable of study had on the binary dependent variable was determined by logistic regression analysis. MLS and MLT programs overall revealed the variables of recruitment and securing faculty are statistically significant concerns. Logistic regression analysis of MLS programs identified statistically significant concerns with recruitment and retention. Logistic regression analysis of MLT programs revealed statistically significant concerns with budget and clinical affiliation. These findings indicate that there are significant differences between program concerns. To account for this, it is necessary to look at the statistical methods used. The chi-square test of independence analyzed the relationship of each independent variable with the dependent variable of the study. This is to say that each concern was examined independent of the other possible concerns. The chi-square analysis shows more significance because the other independent variables are not being analyzed in each model. The logistic regression analysis measures the effects of all independent variables in one model to determine its effect on the dependent variable.

Recruitment issues were reported by 140 (57.9%) of program directors. For both MLS and MLT programs, the community college location reported the greatest concern with recruitment followed by university based MLS and MLT programs. Seventy-seven (31.8%) of program directors cited lack of knowledge about medical laboratory programs, 11 (4.5%) stated declining enrollment, 5 (2.1%) had insufficient personnel or

funds for recruitment activity, with 59 (24.4%) stating they felt it is a combination of the aforementioned concerns. Another contributing factor may be due to a lack of recruitment initiatives since it was reported that 121 (86.4%) of program directors surveyed have no designated recruiter and 174 (72.0%) having no marketing plan. Recruitment activities as stated by Lehman et al. (1995), such as actively reaching out to high school students through participation at high school career fairs and sending literature about the program to guidance counselors could prove to be beneficial. This is where an interest may begin for a field that has remained largely unnoticed. Other recruitment activities on campus might include focusing on minority and non-traditional students as well as recent graduates with biology and chemistry degrees. Bringing visibility to the program may also be accomplished by placing brochures and program information in common areas of the medical laboratory science facility (Lehman et al., 1995). In addition to these activities, Stuart (2003) found that keeping college advisors up to date with program information may assist with referrals to the program. Hospital programs not reporting recruitment concerns may be attributed to the program only accepting as many students for available positions; in fact the pool of applicants may exceed available openings. Student recruitment can prove difficult as potential students may be chose other healthcare professions because of a perception that the medical laboratory has little advancement opportunities and flat salaries in comparison with other health care professionals (ASCP, 2013). A lack of advancement opportunity and wage disparity from the perspective of the student may lead to a belief that there is a low return on investment. Recruitment efforts are necessary to maintain an adequate student base in the programs. However, additional active recruitment may add to the work-load burden

already faced by the program director. Therefore, the addition of a program recruiter may alleviate this burden and allow a concentrated effort focused solely on recruitment efforts.

There was no overall concern with student enrollment. This is apparent by the findings that only 30 (12.4%) of program directors reported a decrease in enrollment. The survey responses were further analyzed because recruitment was found to be a significant concern, yet enrollment was not. The responses indicated that of the programs with steady enrollment, the program directors contributed this to implementing a recruitment strategy with various recruitment efforts such as advertising to increase visibility of the program. Contributing to positive enrollment numbers are biology and chemistry graduates who seek the medical laboratory profession because they are not employable with their current degree. These graduates seek to further their education with studies in the MLS or MLT programs. According to J. Mistovich (personal communication, November 26, 2014) enrollment especially in the two-year degree programs can be tied to the economy. As the economy declines, individuals may seek a two-year degree that offers viable employment; the two-year MLT degree program may offer this opportunity.

Retention data as reported in Table 5 indicated that 84 (67.2%) of MLT programs compared to 29 (24.8%) of MLS programs directors had concerns about student retention. Of all the respondents, those from MLT programs; 10 (76.9%) of the university based programs and 73 (67.0%) of community college based programs reported the greatest concerns with student retention. These results could be related to the

demographics of the student population. Retention issues might be tied to whether or not the program has an "open admission" policy. Students that have completed the pre-requisites were accepted into a program, but could not complete the coursework. This could lead to student attrition. The program director may gain insight on any trends by gathering and keeping a log of student attrition. The log could include pertinent student demographic information along with any information gained by conducting an exit interview or having correspondence as to why a student chose leave the program.

Program budgets, as evidenced in the survey revealed that 165 (68.2%) of program directors felt that their budget was adequate. One possible reason for this is the data on student enrollment. The results showed that enrollment was stable; therefore, the operational needs of the program have been met by the institution. Program directors that reported an increase in recruitment activity report and an increase in enrollment stated their institutions support their programs by funding or in a few cases by increasing class size. Although budget was not reported as being an overall concern, the survey question did not address any specific budget issues. As noted in personal correspondence (J. Mistovich, personal correspondence, November 26, 2014), and as reported by the DHHS, operation of the MLS or MLT program is costly with institutions having to deal with the rising cost by raising tuition and laboratory fees that are paid by the students.

Concerns with securing faculty were reported by 129 (53.3%) of program directors. The challenge of finding qualified faculty is a concern to both university and community college based programs. Many of the program directors were relatively new as 88

(36.4%) reported serving as a program director for five or less years. These new directors may need to recruit new faculty as many of the qualified faculty are reaching retirement age or if the program is new to the institution. The difficulties with securing faculty as stated by Rogoski (2010) may be caused by the unavailability or inexperience of laboratory professionals to bridge over into the academic setting. Workloads, anxiety, a lack of guidance, and low salaries could be deterrents as well. These professionals may also lack the advanced degrees that are an academic requirement.

Clinical affiliation was reported as a concern by 117 (48.3%) of program directors. The responses from the survey indicated that although this is a challenge, program directors are able to adjust their programs accordingly to accommodate the students if need should arise. Some of the alternatives that are being used have been cited as limiting enrollment to only accommodate the number of placement spots available; however, this can affect program expansion. The ability to offer students a mock or simulated student laboratory experience on campus is another alternative, especially for microbiology and blood bank rotations. Because 104 (43.0%) of program directors have stated that blood bank and microbiology are the most troublesome areas for placement, a simulated on-campus laboratory experience offers a possible solution. The implementation of online simulated laboratory experiences is another alternative. This involves the use of interactive online laboratory exercises. The activities are performed by the students away from campus. Learning modules are set up with assigned activities. All aspects of testing are shown with immediate feedback given to the students. Clinical rotations being offered on off-shifts at affiliate laboratories may also accommodate students. Another option is to

find clinical affiliates farther away, with the program assisting with the students travel expenses. The last option is to delay the student's graduation a semester until the clinical rotation is completed, but this may not be in the best interest of the student.

Research/scholarly activity concerns were assessed because this could be a requirement for promotion and tenure especially in four-year institutions. The data indicated that there was no statistically significant association between research and scholarly activity and its perception as a concern. This is not to say that there is not a concern. Difficulty in satisfying the requirement was seen with those program directors that have programs located in university setting as 52.8% of MLS program directors and 38.5% of MLT program directors stating there is a requirement which they feel they have difficulty completing. The lack of statistical significance may be attributed to 181 (74.8%) of program directors reporting they have no requirement for research/scholarly activity at their institution with hospital and community college based programs having an influence on the results.

Limitations

Although *Challenges of MLS and MLT Program Directors* was designed to assess program director concerns, there are several limitations that need to be taken into consideration when reviewing this research. The first limitation is that the study only was able to reach those programs that were operational; therefore analysis of closed programs was not performed. There is no assessment of the reasons for program closure; enrollment or budget concerns may have proven to be a concern. A second limitation was

that some of the questions only asked if there was a particular concern, never expanding on the question to gain any further insight as to why the respondent answered the way they did. In addition to this, some of the survey questions had multiple reasons for concerns, not just a yes or no response. There was, thus, a need to interpret responses into a dichotomous response in order to run appropriate analysis. Lastly, the diverse population of respondents may have affected the results. Differences within MLS or MLT programs due to geographic and program location may be a contributing factor for a concern. This study was not able to examine all of contributing factors that may affect each individual program.

Recommendations for Future Research.

Based on the results of this study, there are recommendations for future research. Some of the limitations may be minimized in an adapted version of the study. To assess the needs of an individual program type, a study that focuses on either MLS or MLT program could be conducted. A study of either MLS or MLT programs by its particular location may address concerns within the university, community college, or hospital setting. It may be beneficial to survey students to gain insight on reasons why the MLS or MLT program was chosen, this could help in recruitment efforts. Any additional research on the reasons as to why a program was closed would prove advantageous so that a pro-active approach may be taken to avoid potential closure.

Conclusions

The conclusions of this research study are guided by the study hypothesis:

H_o: Availability of clinical sites and qualified faculty are not statistically significant concerns of NAACLS accredited MLT and MLS program directors.

H_a: Availability of clinical sites and qualified faculty are statistically significant concerns of NAACLS accredited MLT and MLS program directors.

The analysis of the data to determine statistical significance of MLS and MLT programs shows that the availability of qualified faculty is a significant concern of MLS and MLT program directors but the availability of clinical sites is not. Based on the relationships with other variables of study, there was statistical significance seen with the variables of recruitment, retention and budget as being additional significant concerns of program directors.

Reviewing MLS and MLT programs individually, the conclusion can be made that the availability of qualified faculty was a significant concern for MLS program directors with the availability of clinical sites not showing statistical significance. The other variables of study that showed significance for MLS programs were recruitment and retention. For MLT programs, the availability of qualified faculty was not a statistically significant concern; however, the availability of clinical sites was statistically significant. The other variable of study that showed significance for MLT programs was budget.

To address the hypothesis as stated, the availability of clinical sites and qualified faculty are shown to be significant concerns, but it is apparent that they are concerns of either the MLS or MLT program; therefore the alternate hypothesis is accepted.

To summarize the conclusions, and to answer the research question "*What are the major concerns of MLS and MLT program directors?*" it is concluded that the results reveal there are numerous challenges and concerns that program directors are faced within program operation. For the overall sample of MLS and MLT programs, recruitment, retention, budget and securing faculty are concerns with a growing concern of securing and maintaining clinical affiliate sites. The results did show differences in the findings between MLS and MLT programs. The present study has been able to reveal multiple concerns for programs that may assist program directors to evaluate their individual program and to develop a strategy for program survival.

The results and conclusions of the study have provided evidence that there are multiple challenges and concerns facing MLS and MLT program directors, but not all programs are facing the same challenges. This study attempted to define what the major concerns are overall, with the ultimate goal of not only program survival but future program success.

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Appendix A

Institutional Review Board Letter of Approval

Youngstown
STATE UNIVERSITY

One University Plaza, Youngstown, Ohio 44555
Office of Grants and Sponsored Programs
330.941.2377
Fax 330.941.1580

July 3, 2014

Dr. Joseph Lyons, Principal Investigator
Ms. Alison Kovach, Co-investigator
Department of Health Professions
UNIVERSITY

RE: HSRC Protocol Number: 005-2015
Title:

Dear Dr. Lyons and Ms. Kovach:

The Institutional Review Board has reviewed the abovementioned protocol and determined that it is exempt from full committee review based on a DHHS Category 3 exemption.

Any changes in your research activity should be promptly reported to the Institutional Review Board and may not be initiated without IRB approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the IRB.

The IRB would like to extend its best wishes to you in the conduct of this study.

Sincerely,

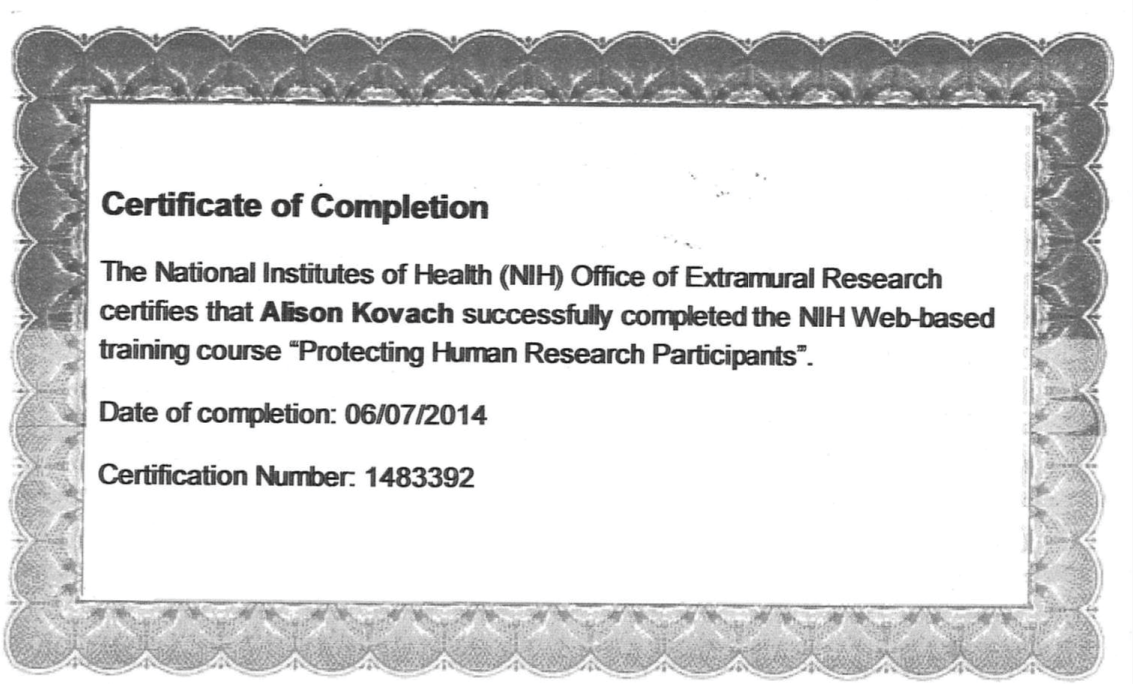
Dr. Daniel Suchora
Interim Associate Dean for Research

DS/cc

c: Mr. Joseph Mistovich, Chair
Department of Health Professions

Appendix B

National Institutes of Health Office of Extramural Research Certificate



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Alison Kovach** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 06/07/2014

Certification Number: 1483392

Appendix C

Survey Instrument

Challenges of MLS/CLS and MLT/CLT Program Directors

Dear Sir or Madam,

My name is Alison Kovach. I am a graduate student at Youngstown State University in the Master of Health and Human Services Program. We are conducting a survey to investigate the concerns and challenges of MLS/CLS and MLT/CLT program directors and we are hoping that you will participate. The results of this
survey will be handled in a professional and confidential manner. The information you provide is without
identifiers so your identity can not be linked to the results. Your participation is voluntary. We understand that your time is valuable. This survey should take approximately 10 minutes to complete. Your participation will help us gain a better understanding of the concerns and challenges that you, as a program director, face. We will be collecting demographic data and frequency responses which will be aggregated. If you complete the survey, I will be willing to offer you an electronic copy of the thesis when it is completed as well as a copy of any subsequent journal publication. Please contact Alison Kovach at aakovach@ysu.edu or Joseph Lyons at jplyons@ysu.edu if you have any questions. You may also contact Ed Orona at corona@ysu.edu at the YSU Office of Grants & Sponsored Programs

We thank you for your time

Challenges of MLS/CLS and MLT/CLT Program Directors

Part I: Recruitment

1. Are there issues in recruitment into the program at your institution related to:

- [ ] a. Declining enrollment in general at my institution
- [ ] b. Lack of knowledge about medical laboratory programs
- [ ] c. Unsure how to outreach
- [ ] d. Insufficient personnel or funds to recruit
- [ ] e. None of the above - we do not have recruitment issues at the present time

f. Other (please specify)

2. Over the past five years enrollment in my program has

- ◯ a. Increased
- ◯ b. Decreased
- ◯ c. Remained about the same

3. If enrollment has increased, this is most likely a result of?

- ◯ a. Biology/Chemistry graduates and/or other graduates seeking a viable career
- ◯ b. Increased visibility of program
- ◯ c. Recruitment initiatives
- ◯ d. N/A - enrollment has not increased

e. Other (please specify)

Challenges of MLS/CLS and MLT/CLT Program Directors

4. If enrollment has decreased, this is most likely a result of?

- ◯ a. Lack of financial support for the program by our institution
- ◯ b. Students unaware of program
- ◯ c. Lack of recruitment initiatives
- ◯ d. N/A - enrollment has not decreased

e. Other (please specify)

5. Is student recruitment a challenge?

- ◯ a. Yes
- ◯ b. No

6. Is student retention a challenge?

- ◯ a. Yes
- ◯ b. No

Challenges of MLS/CLS and MLT/CLT Program Directors

Part II: Clinical Affiliates

7. Currently, do you have adequate clinical sites for your students?

- ◯ a. Yes - clinical placement is not an issue
- ◯ b. Yes - but clinical placement is becoming more of a concern each year
- ◯ c. No - I had to use a clinical waiting list agreement at least one time during the past five years
- ◯ d. No - I had to take less students in my program because of the lack of sufficient clinical affiliates

8. What alternatives do you have when clinical sites are not available? Mark all that apply.

- ☐ a. We adapt our student laboratory to supplement the training
- ☐ b. We shorten the length of the clinical experience
- ☐ c. We request that our sites take an additional student
- ☐ d. We offer the internship during a different semester
- ☐ e. N/A

f. Other (please specify)

9. Which of the following areas are problematic in placing students for internships? Mark all that apply

- ☐ a. Hematology
- ☐ b. Blood Banking
- ☐ c. Microbiology
- ☐ d. Chemistry or core laboratory
- ☐ e. Phlebotomy
- ☐ f. None of the above

g. Other (please specify)

Challenges of MLS/CLS and MLT/CLT Program Directors

10. Which best describes your relationship with the clinical affiliates?

- ◯ a. We have a good relationship, and I am confident that they will take my students for clinical training.
- ◯ b. We have a good relationship, but they feel more stressed to take a student due to limited personnel resources for teaching.
- ◯ c. We have a good relationship, but there are more requests for clinical training from other MLT and MLS programs.
- ◯ d. They may be difficult to work with, and it's a struggle to get a commitment for student placement.
- ◯ e. None of the above

11. How active are you in obtaining new clinical sites?

- ◯ a. Very - I work on this at least once a week
- ◯ b. Somewhat- I on this a few times a month
- ◯ c. Not at all - I seldom work on obtaining new sites

12. Do you feel that you have adequate clinical sites?

- ◯ a. Yes
- ◯ b. No

Challenges of MLS/CLS and MLT/CLT Program Directors

Part III: - Program Resources

13. In addition to yourself, how many other full time faculty are there in your program?

- ◯ a. None
- ◯ b. 1
- ◯ c. 2
- ◯ d. 3
- ◯ e. 4
- ◯ f. 5 or more

14. On average, how many part time or adjunct faculty assist in instruction each year? This does NOT include clinical instructors at the affiliated sites.

- ◯ a. None
- ◯ b. 1-2
- ◯ c. 3-4
- ◯ d. 5-6
- ◯ e. 7-8
- ◯ f. 9 or more

15. Do you have requirements for research and scholarly activity at your institution that are difficult yo complete due to time constraints associated with program administration?

- ◯ a. Yes - we have a research component for promotion, which is difficult to complete
- ◯ b. Yes - we have a research component for promotion, but I am able to complete it
- ◯ c. No - we do not have a research component for promotion

Challenges of MLS/CLS and MLT/CLT Program Directors

16. Of the responses listed, what is the biggest concern for you personally, as program director when it pertains to your job?

- ◯ a. Too many assignments (teaching, administrative, etc.) required by my institution
- ◯ b. Difficulty in securing qualified faculty
- ◯ c. Enrollment decline and fear of program closure
- ◯ d. Declining resources and fear of program closure

e. Other (please specify)

17. In comparison to other allied health programs within my institution or division, our program receives _____ financial resources.

- ◯ a. More
- ◯ b. Less
- ◯ c. Comparable

18. Do you feel that your program budget is adequate?

- ◯ a. Yes
- ◯ b. No

19. Do you have a designated recruiter for your program?

- ◯ a. Yes
- ◯ b. No

20. Do you have a marketing plan for your program?

- ◯ a. Yes
- ◯ b. No

21. Is securing qualified faculty to teach a challenge?

- ◯ a. Yes
- ◯ b. No

Challenges of MLS/CLS and MLT/CLT Program Directors

22. Are the responsibilities placed on you as director a challenge?

- ◯ a. Yes
- ◯ b. No

Challenges of MLS/CLS and MLT/CLT Program Directors

Part IV: Demographics

23. How many years has your program been in operation?

- ◯ a. Five or less years
- ◯ b. 6-10 years
- ◯ c. 11-15 years
- ◯ d. 16-20 years
- ◯ e. 21-25 years
- ◯ f. 25 or more years

24. Program type

- ◯ a. MLT/CLT
- ◯ b. MLS/CLS

25. Program location

- ◯ a. University
- ◯ b. Hospital
- ◯ c. Community College
- ◯ d. Technical School
- ◯ e. Proprietary School

26. Number of years as program director?

- ◯ a. Five or less years
- ◯ b. 6-10 years
- ◯ c. 11-15 years
- ◯ d. 16-20 years
- ◯ e. 21-25 years
- ◯ f. 25 or more years