

ORIGINAL ARTICLE Kareem *et al.*, Exploring Medical Laboratory Science Trainees' Opportunities
**Exploring the Interests, Benefits, and Opportunities among Medical Laboratory
Science Trainees towards an Efficient and Professional Health Care Service Delivery**

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Abstract

Background: Trainee health professionals play a crucial role in shaping the future of healthcare delivery. Understanding their interests, perceived benefits, and opportunities is crucial for optimizing their training and enhancing their contributions to the healthcare system. This study examines the interest, benefits, and opportunities among Medical Laboratory Science (MLS) trainee professionals regarding efficient health service delivery at Al-Hikmah University, Ilorin.

Methods: This study is a cross-sectional survey conducted among MLS students at Al-Hikmah University, Ilorin. A questionnaire designed by the authors was administered to third- to fifth-year students, exploring their interest, benefits, and opportunities as trainees in the medical profession.

Results: The survey revealed that, a little above average (66%) choose to be a trainee in MLS due to passion to serve humanity, while (52%) value workshops opportunities from the association body at student level, some (64%) requires moral support or benefits to continuing their education in their area of interest. Most of the trainees (94%) are interested in postgraduate studies to acquire more knowledge to save lives. Moreover, many (78%) support continuous interactive seminars to boost their confidence and improve their performance in the near future.

Conclusion: The study highlights the need for more workshop opportunities and moral support to sustain the interest of the trainees. We therefore recommend that trainees be encouraged to further their education to the postgraduate level and be exposed to more workshops and seminars during their undergraduate training, enabling them to fulfill their purpose of providing an efficient health service delivery.

Keywords: Benefits, interests, opportunities, Medical Laboratory science residents, Health service delivery.

Introduction

The healthcare sector relies heavily on the critical role of Medical laboratory professionals in ensuring accurate diagnoses. Medical Laboratory trainees, as future professionals, are essential to maintaining a high standard of care and practice during their training. ¹. Delivering quality healthcare requires a workforce that is not only technically competent but also passionate about providing excellent care. However, their interests,

motivations, and opportunities for growth are often overlooked. ².

The Medical Laboratory Scientist (MLS) plays a vital role in the healthcare system by providing healthcare professionals with objective data to guide disease prevention, risk assessment, diagnosis, prognosis, treatment, and patient monitoring, ensuring safe, informed, and practical clinical decision-making. ². In recent years, with the rapid evolution of medical research and technology, it is hard to imagine a healthcare

ORIGINAL ARTICLE Kareem *et al.*, Exploring Medical Laboratory Science Trainees' Opportunities system without the contributions of a Medical Laboratory scientist.³ The profession emphasizes the importance of adequate laboratory skills and result interpretation, which must be balanced with theoretical knowledge and the training of trainees.^{4,5}

Medical Laboratory trainees are being trained to perform laboratory tests and analyze samples to diagnose and treat diseases⁶. They are guided on various laboratory techniques, equipment, and technologies to analyze blood, urine, tissue, and other body fluids to detect the presence of pathogens, chemicals, or other abnormalities that may indicate a disease^{2,4}. The profession is a multidisciplinary field that encompasses various disciplines such as Clinical Chemistry, Hematology, blood transfusion science, Medical microbiology, parasitology, virology, Immunology, Histopathology, Cytology, and Molecular biology, which trainees must pass through during the period of their study^{6,7}. These disciplines require the interest of the trainees to provide accurate and reliable laboratory results that are essential for an efficient and professional health care service delivery⁶.

The Medical Laboratory Science Council of Nigeria (MLSCN) was established in 2003 to regulate and oversee the practice, benefits, and interests of all trainees of Medical Laboratory Science in Nigeria⁸. They are responsible for ensuring that the students are appropriately trained, licensed, and adhere strictly to professional standards to improve the health care service delivery⁹.

As the healthcare landscape evolves, it is crucial to understand the factors that drive trainees to deliver high-quality care and diagnosis. This study aims to explore the interests, benefits, and opportunities among medical laboratory science trainees in delivering efficient and professional healthcare diagnosis. By doing so, we can identify strategies to enhance their role in healthcare delivery, ultimately leading to improved patient outcomes and healthcare services overall.¹⁰

Methodology

Study area: Al-Hikmah University is located in the North Central Ilorin, Kwara State, Nigeria. The College of Health Sciences at Al-Hikmah University, Ilorin, Nigeria, was established in 2025. The Department of Medical Laboratory

established in 2018. It aims to produce highly skilled Medical Laboratory Scientists who meet both national and international standards. The department offers a Bachelor of Medical Laboratory Science (BMLS) program, which provides students with a strong academic and professional foundation. The curriculum is designed to reflect advancements in the field, equipping students with practical skills and theoretical knowledge. Graduates are trained to excel in clinical diagnostic services, research, and quality assurance. The program also emphasizes transferable skills, enabling graduates to work in various sectors, including healthcare, pharmaceuticals, and research institutions.

Study design: This study employed a cross-sectional feedback design, conducted among 300 to 500 level trainees of the Medical Laboratory Science program at Al-Hikmah University, Ilorin, Kwara State, using a simple random sampling technique.

Study population: The study population comprises undergraduate trainees in Medical Laboratory Science at the institution.

- I. Students of the Medical Laboratory Science Department
- II. Undergraduates between the third year and the fifth year of study
- III. Students who gave their consent.

Exclusion criteria

- I. Eligible students who are absent during the data collection period
- II. Eligible students who withdraw their consent during the study procedure.

Sample size calculation

The sample size was calculated using the Cochran formula: $[n = Z^2 p (1-p)/d^2]$ where n = sample size, Z = the standard deviation at a 95% confidence interval, which is = 1.96; P = proportion of students studying MLS trainees in Kwara state = 7% = 0.07; $q = 1-p = 1-0.07 = 0.93$; d = degree of accuracy (maximum allowable error) of 5% = 0.05

$$n = \frac{1.96^2 \times 0.07 (1 - 0.07)}{0.05^2} = 100$$

A total of 100 trainees were recruited in this study.

Data Collection tools: Data were collected using well-structured, self-administered questionnaires specifically designed to obtain information that

ORIGINAL ARTICLE Kareem *et al.*, Exploring Medical Laboratory Science Trainees' Opportunities was used to either include or exclude trainees from this study. the questionnaire was administered to the participants through an interviewer-assisted method, serving as the primary source of data for this study.

Data Collection Method: The questionnaires were administered by the researchers to trainees selected from the 300- to 500-level MLS departments. It was pre-tested on five undergraduate students from other faculties at the University, and the results obtained from the pre-test were used in the final adjustment of the questionnaire.

Study procedure: A cross-sectional feedback study design was conducted among one hundred third-year to fifth-year MLS students using a simple random sampling technique. The authors designed the study questionnaire, adopting one from previous related studies that utilized validated questionnaires. The questions were categorized into six sections: Biodata, Interests of the trainees, opportunities for workshops, continuous seminar programs, Moral support to improve performance, and encouragement for Postgraduate studies. Each section has different items scored on a binary (Yes or No) or Likert scale (1 -5). The results of the students' feedback were analyzed to identify the

key components of interests, benefits, and opportunities among MLS trainees. The study was conducted in accordance with ethical standards, following informed consent obtained from the participants.

Data Management and Analysis: Data was collected manually and checked for corrections, missing entries, and incompleteness. The data were then analyzed using the STATA version 18. Mean and standard deviation were estimated for continuous variables; while frequencies and proportions for the categorical variables. Results were presented in figures and tables.

Ethical considerations: The research procedure was explained to the participant through the information sheet, while international ethical norms and standards were strictly adhered to. This research adhered to ethical guidelines to ensure academic integrity and participant protection. Before data collection, participants were fully informed of the study's purpose, procedures, and the right to withdraw consent at any time. To ensure confidentiality, participants' identities were protected by anonymous codes, which were used for data entry and analysis instead of names or specific details. Additionally, any potential identifying

information gathered during the research was stored in an encrypted computer and was accessible only to the researcher. These data were used solely for the study's intended research purpose and were never shared externally without explicit permission. This study ensured transparency and respected the participants' privacy when capturing, analysing, and reporting personal data. The gathered data were kept on a safe, password-protected iDrive for future reference.

Results

Table 1 presents the sociodemographic characteristics of the participants. The Minimum age was found to be 18 years, while the maximum age was 39 years. The mean age was estimated to be 22.2 years, with the modal age being 20 years.

Figure 1 shows the interest of the trainees in various units of the profession. The survey revealed that (100%) of them choose to be a trainee in MLS due to passion to serve humanity, with 52% of them interested in Haematology and blood transfusion science, 18% interested in Medical microbiology and parasitology, 21% interested in chemical pathology and 9% of them interested in Histopathology and cytology.

Variables	Class	Frequency (n)	Percentage (%)
Age (years)	18-23	38	38%
	24-30	29	29%
	31-36	23	23%
	37-42	10	10%
Gender	Male	35	35%
	female	65	65%
Level	300	42	42%
	400	38	38%
	500	20	20%
Religion	Islam	90	90%
	Christian	10	10%
Marital Status	Single	92	92%
	Married	8	8%

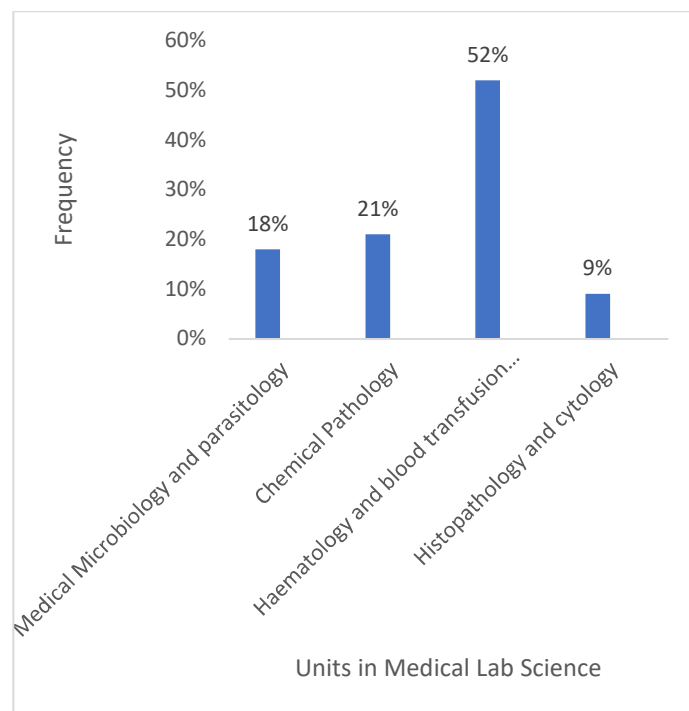


Figure 1: Specialty interests of trainees

Figure 2 shows how the trainees value workshop programmes. About half (52%) value workshop opportunities provided by the association at the student level to support them.

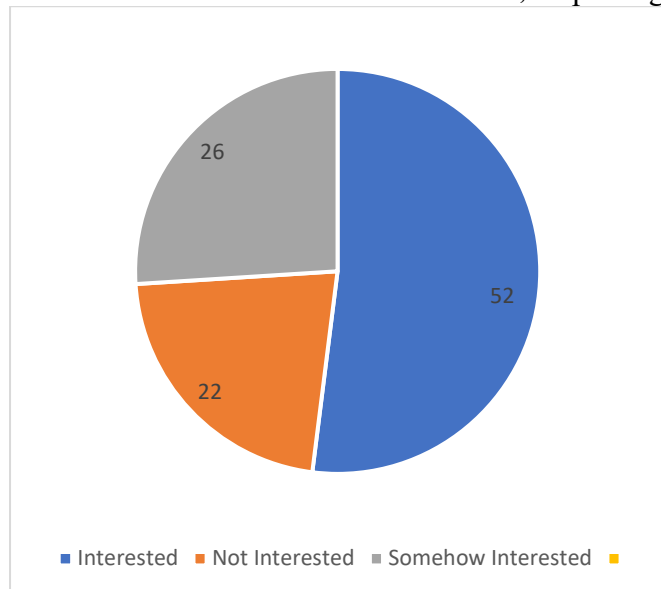


Figure 2: Opportunities for Workshop

Figure 3 shows that most trainees (94%) are interested in postgraduate studies to acquire more knowledge and advance in their careers, as well as save lives.

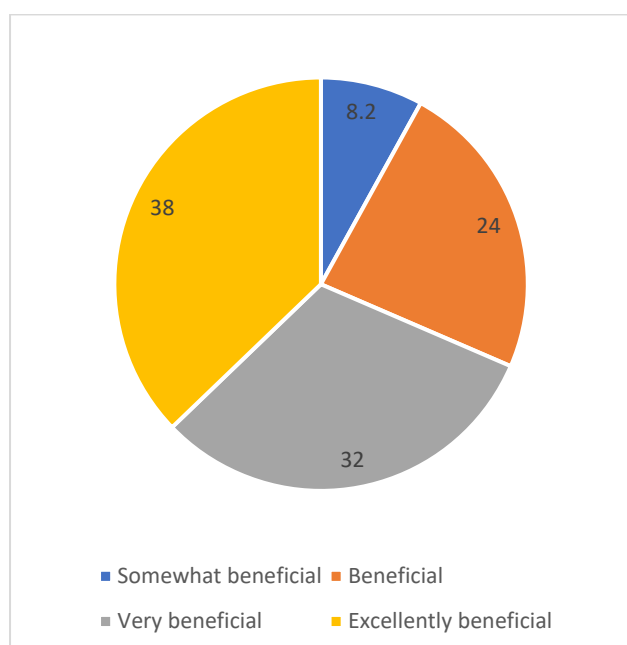


Figure 3: Interest in postgraduate studies

Figure 4 explains the interest of the trainees in interactive seminars. Many (78%) of them support continuous interactive workshops to boost their confidence and improve their performance in the near future.

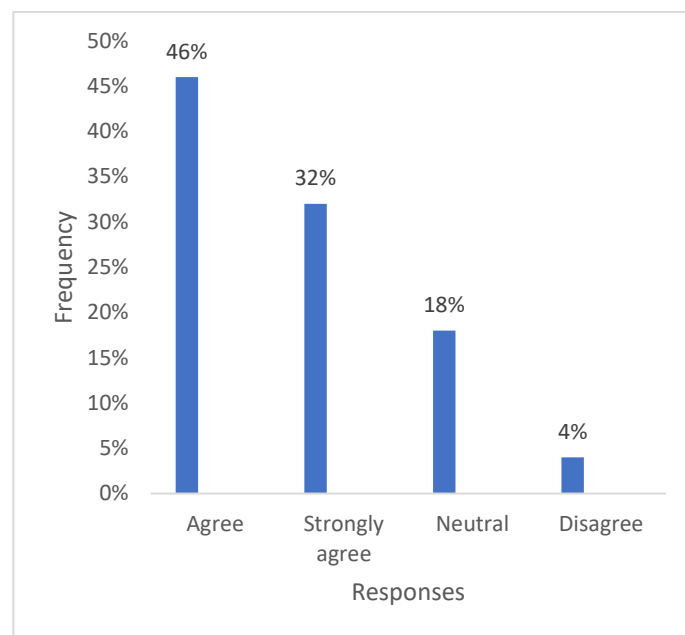


Figure 4: Desire for interactive seminars

Discussion

Today, Medical Laboratories play a significant role in the health care system and the decision-making of clinicians with regard to their patients ^{11,12}. According to official data, 60 to 70% of clinical decisions about hospitalization, discharge, and prescription are based on laboratory results ¹³. Students' awareness about a program plays an important role in the choice of their future careers

52% of the trainees are interested in Haematology and blood transfusion science. A lower percentage compared to the survey by Mainasara and colleagues ¹⁶, which found that 34.6% were interested in the same field, with the majority being from the 300-level. However, 18% of the trainees in this study showed interest in Medical Microbiology and Parasitology, which aligns with a similar study by Mainasara and colleagues, where 20.9% of students at Usman Danfodiyo University expressed interest in the same field¹⁶. In this study, 21% of the trainees are interested in Chemical Pathology, and 9% are interested in Histopathology and Cytology. These findings closely align with the survey by Mainasara and colleagues (2016), which reported that 18.2% were interested in Chemical Pathology and 12.6% in Histopathology ¹⁶.

The demand for allied health professionals, Medical Laboratory Scientists, physiotherapists, and respiratory therapists is increasing globally. To meet these demands and challenges, institutions must strive to structure their curricula and design new training programs that address the health needs of hospitals and clinical services across the nation. It is helpful to study students' attitudes towards the

programs and their educational needs to inform the implementation of changes that lead to optimal improvement.

Workshops offer several advantages to students' preparation, including the development of interest and understanding in academic medicine ¹⁷; improvement in patient safety, and enhancement of the quality of medical care, as well as the development of clinical skills ^{18,19}. Moreover, workshops significantly improve first-year medical students' understanding of medical topics, positively impacting their learning ²⁰.

The findings of this study indicate that 52% of the trainees' value workshop programs as a means to foster and enhance their roles in healthcare delivery. Theoretical learning accounts for most of the medical training. Future medical students' development can be improved through experiential learning, particularly hands-on workshops ²¹. The advantages of experiential learning, including increased confidence, motivation, knowledge, and practical application, have been emphasized for a long time and align with the benefits we have highlighted.

Furthermore, research consistently emphasizes that

experiential learning equips students with broad knowledge and skills²². Postgraduate study is an opportunity to delve deeper into a specific field of interest, expand your knowledge, develop specialised skills, and open doors to additional employment prospects²³. The finding of this study revealed that most of the trainees (94%) are interested in post graduate studies to advance their career; grow their earning potential, knowledge, and expertise; develop higher level thinking, writing and research skills; and provide networking opportunities with like-minded individuals that are invaluable for personal and professional life.

The benefits of postgraduate education are especially evident in the development of professional skills.²⁴ increased employment options, and personal growth²³. Based on the feedback from students in this study, 78% support continuous interactive seminars as an effective way to help individuals build confidence and enhance their professional skills, which can improve them in the near future. Based on Lafferty's findings,²⁶ community colleges have the opportunity to enhance student success and persistence by offering first-year seminars that may mitigate

attrition, improve retention, and promote

completion. previous studies noted that first-year seminars foster engagement by helping students engage more frequently with faculty, participate in more active and collaborative learning activities²⁵, and develop better study habits that lead to higher grades²⁶. Sixty-six percent of seminar course respondents indicated that they asked questions in class or contributed to class discussions, compared to 27% of non-seminar respondents²⁶.

Conclusion and Recommendations

This study highlights the importance of understanding the interests, benefits, and opportunities of Medical laboratory trainees in delivering efficient and professional healthcare. It suggests that trainees are highly motivated, driven by a desire to improve patient outcomes and enhance their professionalism. It also highlights the areas that will enable trainees harness their potential and excel in their roles, ultimately contributing to a high-performance healthcare system.

We hereby recommend a continuous workshop and seminar program that caters to the diverse needs and interests of medical Laboratory trainees, focusing on laboratory diagnosis. We also

recommend providing ongoing education and training opportunities to help trainees stay updated on best practices, technologies, and innovations. Additionally, we suggest recognizing and rewarding trainees' contributions to quality care through awards, certifications, and opportunities for career advancement.

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