



Evaluation of Biomedical Laboratory Science Graduate Employability: Employer Perspectives and Alumni Insights on the Biomedical Laboratory Science Department's Program and Implementation in Timor-Leste in 2024

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Abstract

The objective of this study was to assess the employment status of biomedical science alumni who are currently working in healthcare facilities across the country, as well as to gather feedback from their employers. A structured questionnaire was used to collect data from both employers and alumni, with a total of 18 employer respondents and 34 alumni participants.

Data analysis was conducted using Microsoft Word and Excel software. The findings indicate that selected alumni are employed in various healthcare facilities, including the *National Health Laboratory, National Institute of Pharmacy and Medical Devices*, referral hospitals, community health centers, and private clinics.

Additionally, the graphical analysis revealed that among the 34 selected alumni, 10% are currently employed, 40% are engaged in volunteer work, and the remaining 50% are still seeking job opportunities. These results highlight the employment trends of biomedical science graduates and underscore the importance of continued efforts to enhance job placement opportunities in the healthcare sector.

Key word: Evaluation, alumni, employers, ICS Dili, Timor-Leste

Introduction

To evaluate the basic skills of biomedical laboratory science graduates employed or volunteering in healthcare institutions; to assess the interpersonal skills of these graduates in workplace environments; to analyze the intrapersonal skills of the graduates; to evaluate the professional laboratory skills of these graduates; to gather alumni feedback on the teaching and learning programs to identify areas for improvement.

Graduate employability is a critical issue for higher academic institutions worldwide. It significantly impacts the quality of diagnostics and effective treatments in healthcare settings (Eldeen et al., 2018). In advanced countries, biomedical laboratory professionals play a vital role in both diagnosis and treatment due to the availability of well-trained graduates from accredited institutions (Ahmed et al., 2016). Conversely, in developing nations, the lack of highly skilled graduates in biomedical laboratory sciences remains a pressing issue, highlighting the necessity for quality medical laboratory training programs (Mullan et al., 2011).

The Biomedical Laboratory Sciences Department of the *Instituto de Ciências da Saúde de Dili* (ICS Dili) has produced 74 graduates to date, with the first cohort comprising 23 graduates and the second comprising 51 graduates (Rangel, 2023). Among them, over 12 graduates have been employed by the government of Timor-Leste through the Ministry of Health and various private clinics. However, 62 graduates continue to work as volunteers in healthcare facilities and private clinics.

The perspectives of employers on the knowledge, skills, and attitudes of these graduates are essential for evaluating and enhancing the department's programs. Therefore, the *Ciências Biomédicas e Laboratoriais* (CBL) Department at ICS Dili aims to fulfill its mission of producing highly qualified professionals in biomedical laboratory sciences to address the healthcare needs of Timor-Leste. This survey aims to assess the quality of the skills, knowledge, and attitudes of CBL graduates based on employer feedback and alumni perspectives. This information will help guide improvements to the department's teaching and training programs.

Objectives

To evaluate the basic skills of biomedical laboratory science graduates employed or volunteering in healthcare institutions; to assess the interpersonal skills of these graduates in workplace environments; to analyze the intrapersonal skills of the graduates; to evaluate the professional laboratory skills of these graduates; to gather alumni feedback on the teaching and learning programs to identify areas for improvement and enhance curriculum development.

This assessment aims to provide insights into the strengths and areas for growth in biomedical laboratory education, ensuring that graduates meet industry standards and contribute effectively to the healthcare sector.

Research Method

Study Design

This study employs a descriptive qualitative research design. It is categorized as qualitative research because the data are presented in the form of written language rather than numerical values and are collected in a natural setting. Additionally, it is considered descriptive research because the data are explained descriptively to provide a comprehensive understanding of the subject matter.

This research design was selected to effectively describe the study within the field of biomedical laboratory sciences. In analyzing the data, the researcher applied the theoretical framework of (Rangel, G., 2023), which defines research as a systematic attempt to answer a question. In this case, the study analyzes respondents' answers by evaluating their skill levels and their ability to serve patients in various healthcare facilities based on responses gathered through structured questionnaires.

Study Procedure

Engagement with Healthcare Leaders

Directors and heads of selected healthcare facilities were informed before the commencement of interviews. This included directors of referral hospitals such as those in Baucau, Suai, Maubisse, and Oecusse, as well as heads of Community Health Centers (CHCs) in Laga, Cailaco, Qiamanetco, and Vera Cruz. Additionally, heads of private clinics were also notified before interviews began with alumni working in temporary employment or as volunteers.

Alumni Involvement

All selected alumni from various healthcare facilities were invited to participate in the study. Interviews were conducted with alumni working as temporary employees or volunteers in hospitals, CHCs, and private clinics. The healthcare facilities included HOREX Baucau, referral hospitals in Suai, Maubisse, and Oecusse, as well as CHCs in Laga, Cailaco, Qiamanetco, and

Vera Cruz. Additionally, private clinics employing biomedical laboratory science graduates were also included.

Population

The study population consists of 74 graduates from the Instituto de Ciências da Saúde de Dili (ICS Dili) Biomedical Laboratory Sciences program from the 2019–2020 cohorts (Rangel, 2023). However, this research focuses specifically on selected alumni currently working in health facilities across the municipalities of Dili, Ainaro, Baucau, Bobonaro, Covalima, Oecusse, and Viqueque. The study also involves heads of community health centers, senior medical laboratory professionals, and alumni working in relevant CHCs, referral hospitals, and private clinics.

Sample

According to Hole et al., "A sample is made up of those persons from the group who were chosen for the study." Based on this definition, the researcher selected 18 stakeholders from healthcare facilities that employ biomedical laboratory science alumni and 34 respondents from the total of 74 alumni as key informants for this study.

To collect the data, structured questionnaires were utilized, ensuring that responses accurately reflect the experiences, skills, and employment status of alumni in the biomedical laboratory sciences field.

Results and Discussion

The respondent from stakeholders based on basic skills, inter-personal skills, intra-personal skills and laboratory diagnosis skills as shown in the table 1 and graphic 1.

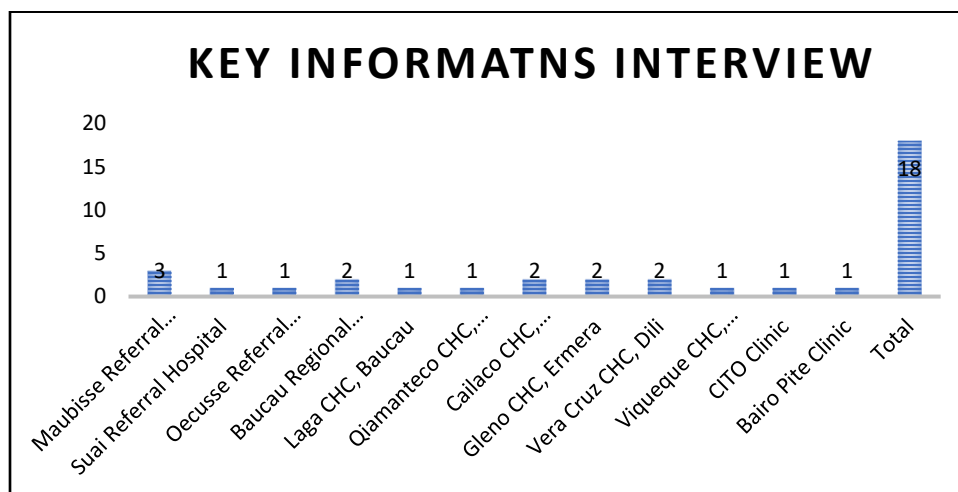
List of KIIs (Stakeholders)	Number of KIIs
Stakeholder from Maubisse Referral Hospital	3
Stakeholder from Suai Referral Hospital	1
Stakeholder from Oecusse Referral Hospital	1
Stakeholder from Baucau Regional Hospital	2
Stakeholder from Laga CHC, Baucau	1
Stakeholder from Qiamanteco CHC, Oecusse	1
Stakeholder from Cailaco CHC, Bobonaro	2
Stakeholder from Gleno CHC, Ermera	2
Stakeholder from Vera Cruz CHC, Dili	2
Stakeholder from Viqueque CHC, Viqueque	1
Stakeholder from CITO Clinic	1
Stakeholder from Bairro Pite Clinic	1
Stakeholder from INFPM	Not realized

Stakeholder from Clinika Sorte Namtate, LDA	Not realized
Total	18

Table 1: List of KIIs (stakeholders and alumni) in 2024

There were 18 key informants' interview (stakeholders) from different health facilities such as public and private where available for the interview. Meanwhile, there were 33 respondents (alumni) had been working as temporary employment and as well as volunteers.

Maubisse Referral Hospital was with the highest stakeholders were 3, followed by HOREX Baucau, CHC Cailaco, CHC Gleno and Vera Cruz CHC, each of them with 2 stakeholders. However, Suai Referral Hospital, Oecusse Referral Hospital, Laga, Viqueque and Qiamanteco CHCs, CITO Clinic and Bairo Pite Clinic with 1 stakeholder. On the other hand, point of view of graduates on department of biomedical laboratory science's policy and programs discussed in the "graduate evaluation on department".



Graphic 1. List of Key Informants Interview

Respondents from stakeholders

There is one graduate from biomedical laboratory science, ICS Dili who is working as temporary employment with performance evaluation as in the following table.

General skills expected				
Type of skills	Specific knowledge	Rating		
		Sufficient	Good	Very Good
Basic Skills	Computer skill		Good	
	MS office		Good	
	Work ethics			Very Good
Inter-personal skills	Communication			Very Good
	Problem solving		Good	
	Team working		Good	

	Time management		Good	
	Adaptability		Good	
	Leadership		Good	
	Decision making		Good	
Intra-personal skills	Self-awareness		Good	
	Self-regulation		Good	
	Self-organized			Very Good
	Motivation		Good	
	Honesty			Very Good
	Empathy		Good	
	Discipline		Good	
	Social skill		Good	
Laboratory professional skills	Phlebotomy		Good	
	Sample management		Good	
	Sample transportation		Good	
	Sample preparation		Good	
	Sample diagnosis/test		Good	
	Laboratory diagnosis procedure		Good	
	Interpretation result		Good	
	Reporting		Good	
	Archiving		Good	

Table 2. Respondents from stakeholders who involved in the study

Those items that requested to evaluate by stakeholders on biomedical laboratory science graduate such as basic skills which include information technology operation and work ethics. Moreover, inter-personal skills related communication, time management and other relevant items. Furthermore, in relation to the intra-personal skills, need to evaluate self-management to adapt her/his self with rule and work instruction at the relevant institution. Additionally, laboratory professional skills related clinical sample collection, labelling, transportation, diagnosis, interpretation result, reporting and archiving. Therefore, graduate or alumni at Maubisse Referral Hospital and other health facilities overall with good performance.

Respondents from Alumni

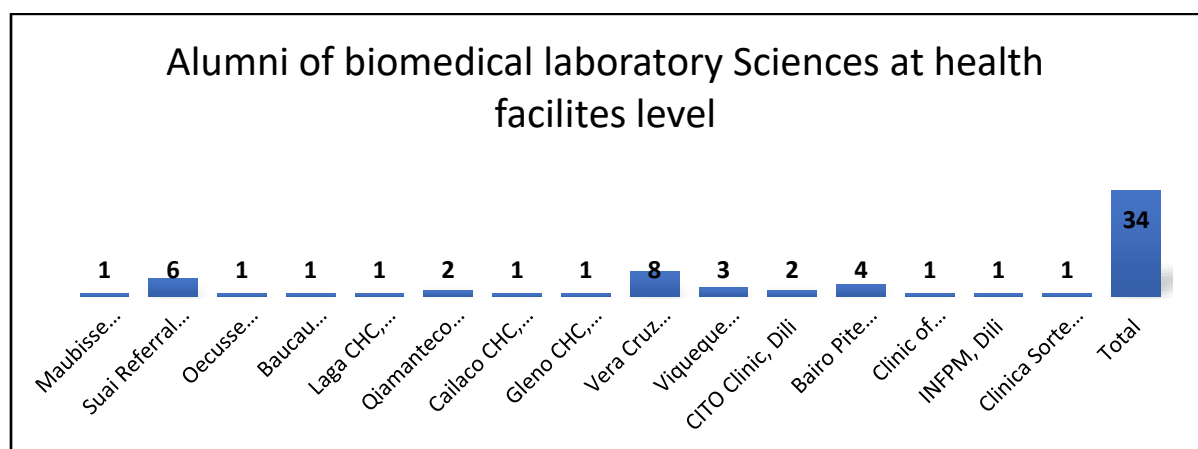
There are 34 graduate students had been interviewed by the researcher to get their point of view regarding department of Biomedical Laboratory science as indicated in the following table.

List of Alumni had been interviewed	Number of graduate students
Alumni at Maubisse Referral Hospital	1
Alumni at Suai Referral Hospital	6
Alumni at Oecusse Referral Hospital	1
Alumni at Baucau Regional Hospital	1
Alumni at Laga CHC, Baucau	1
Alumni at Qiamanteco CHC, Oecusse	2
Alumni at Cailaco CHC, Bobonaro	1
Alumni at Gleno CHC, Ermera	1
Alumni at Vera Cruz CHC, Dili	8

Alumni at Viqueque CHC, Viqueque	3
Alumni at CITO Clinic, Dili	2
Alumni at Bairro Pite Clinic, Dili	4
Alumni at Clinic of Sister, Tuti	1
Alumni at INFPM, Dili	1
Alumni at Clinica Sorte Namtate, LDA	1
Total	34

Table 3. List of respondents from alumni

From 34 graduate students had been selected and involved in the interview, 8 alumni from Vera Cruz CHC, 6 from Suai Referral Hospital, 4 from Bairro pite Clinic, 3 from Viqueque CHC, each of 2 from Qiamanteco and CITO clinics and rest other represent with 1 alumnus who are serving at different health facilities as indicated in the graphic 2.



Graphic 2. Alumni who are serving population at the health facilities level

Respondent from graduate student

No.	Questions	Answers		
		Sufficient	Good	Very Good
1	How do you evaluate the course curriculum?		√	
2	How do you evaluate course program?		√	
3	How do you evaluate the course syllabus?		√	
4	How do you evaluate the competence of lecturers?		√	
5	How do you evaluate the teaching method of lecturers?		√	
6	How do you evaluate the attendance and punctuality of lecturers?		√	
7	How do you evaluate the semester assessment method of lecturers?		√	
8	How do you evaluate the teaching method of lecturers?		√	
9	How do you evaluate the availability of library of the study program?	√		
10	How do you evaluate the availability of laboratory facilities of study program?		√	
11	Are there laboratories instrument that sufficient for the practical class?		√	

12	Are there laboratories reagents that sufficient for the practical class?	√		
13	Are there laboratories consumables that sufficient for the practical class?	√		
14	Are there laboratories durables that sufficient for the practical class?		√	
15	What is your opinion regarding study program of CBL?		√	
16	How long the duration did you get the job?	Around 6-12 months		
17	What is your recommendation to better study program in the future?	Improve practical class due to limit of practical classes for those important subjects such as bacteriology, hematology and other relevant specialty subjects		
18	Will you take part in the programmatic accreditation of biomedical Laboratory Science in the future	Yes, off course		
19	Will you carry on your licentiate and master at CBL, ICS Dili in the future?	Yes, if reduce the school tuition fee		
20	Will you recommend your relatives to carry on study at CBL, ICS Dili?	Yes, I will		

Table 4. The respondent from graduate student who involved in the study

The point of view from graduate students at Maubisse Referral Hospital and others indicated that curriculum, syllabus, teaching and learning methods, assessment of each semester indicated with overall good. However, need to improve laboratory practical classes due to limit of instrument, reagents, consumables and durables to increase laboratory practical classes for those specialty subjects such as bacteriology, haematology and other relevant specialty subjects.

Conclusion

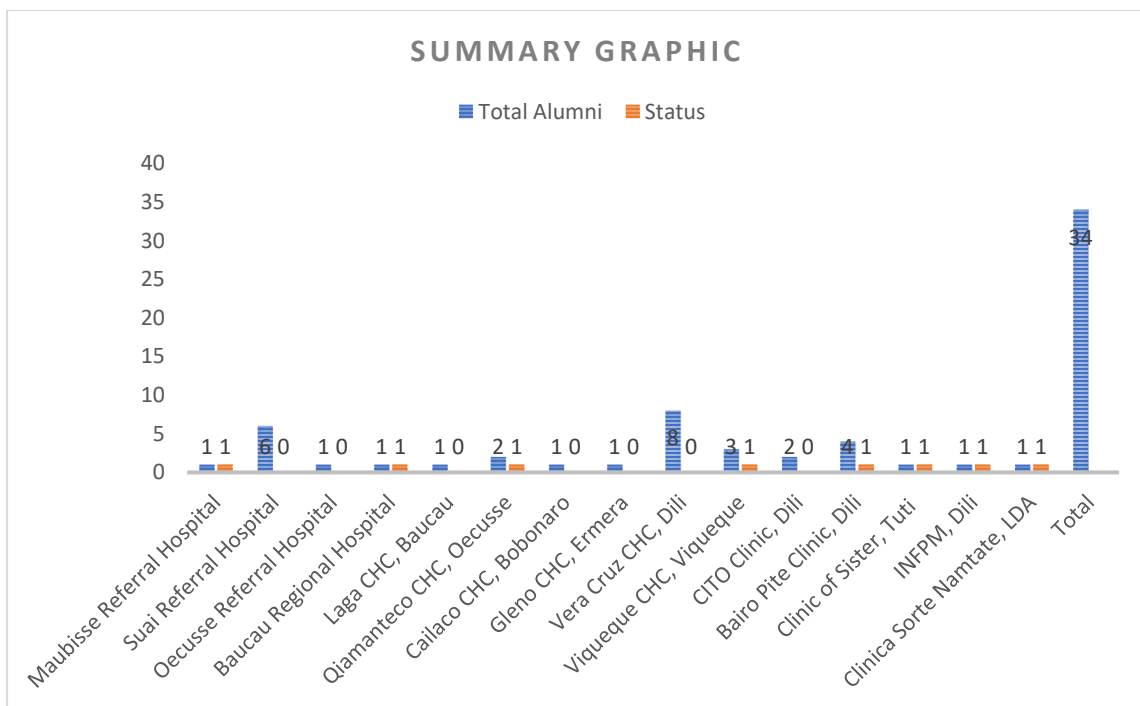
From this study, it is concluded that from 18 stakeholders and 34 alumni had been interviewed with various results as indicated in the table 5 and graphic 4.

List of KIIs (Stakeholders)	Number of KIIs	List of KIIs (Alumni)	Number of KIIs
Stakeholder from Maubisse Referral Hospital	3	Alumni at Maubisse Referral Hospital	1
Stakeholder from Suai Referral Hospital	1	Alumni at Stakeholder from Suai Referral Hospital	6
Stakeholder from Oecusse Referral Hospital	1	Alumni at Oecusse Referral Hospital	1
Stakeholder from Baucau Regional Hospital	2	Alumni at Baucau Regional Hospital	1
Stakeholder from Laga CHC, Baucau	1	Alumni at Laga CHC, Baucau	1
Stakeholder from Qiamanteco CHC, Oecusse	1	Alumni at Qiamanteco CHC, Oecusse	2
Stakeholder from Cailaco CHC, Bobonaro	2	Alumni at Cailaco CHC, Bobonaro	1
Stakeholder from Gleno CHC, Ermera	2	Alumni at Gleno CHC, Ermera	1
Stakeholder from Vera Cruz CHC, Dili	2	Alumni at Vera Cruz CHC, Dili	8
Stakeholder from Viqueque CHC, Viqueque	1	Alumni at Viqueque CHC, Viqueque	3
Stakeholder from CITO Clinic	1	Alumni at CITO Clinic, Dili	2
Stakeholder from Bairro Pite Clinic	1	Alumni at Bairro Pite Clinic, Dili	4
		Alumni at Clinic of Sister, Tuti	1
		Alumni at INFPM, Dili	1
		Alumni at Clinica Sorte Namtate, LDA	1

Total	18	Total	34
Grand Total	51		

Table 5. Summary table of key informants' interview (stakeholders and alumni)

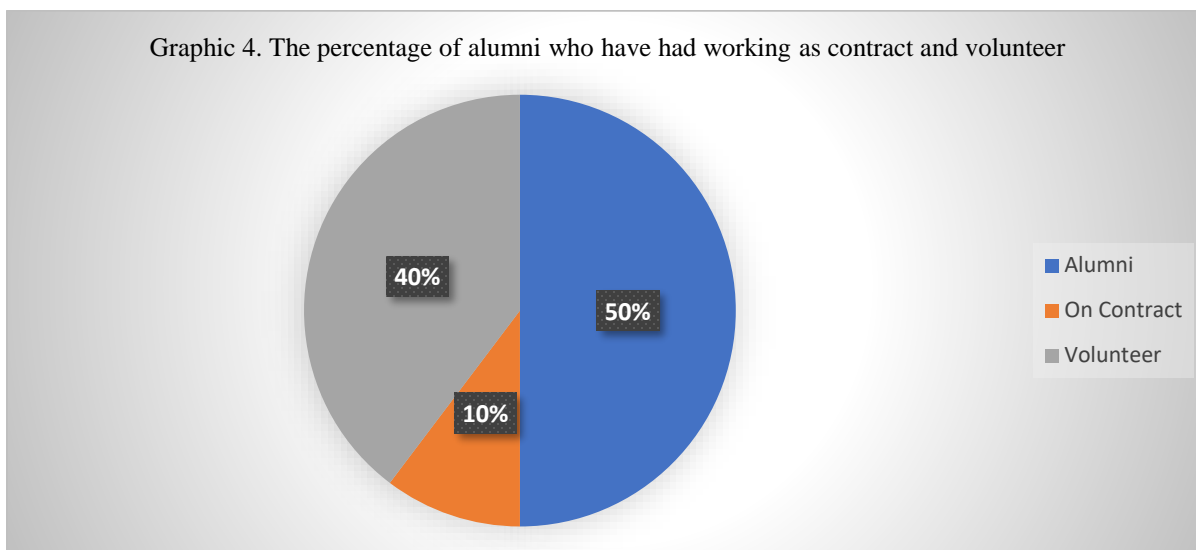
From 74 graduates' alumni, 34 were included in studied which represent more than 50% of biomedical laboratory science graduates. Most of alumni working as volunteers at the health facilities and few of them working as temporary employment or contract with government and private institutions. In the graphic 4 showed that 7 alumni had been contracted by government and private institution where 1 is the symbol those who have had contracted by employers and 0 indicated volunteers only. On the other hand, 5 other alumni where 3 alumni were contracted by FDCH in 2023 and 2 alumni in Oecussi were contracted by local government in 2023 for few months before changing the government from former government to current government. Therefore, with totally 11 alumni had been contracted by government.



Graphic 3. Graphic summary of the alumni who are working as temporary employment and volunteer at the health facilities level

The graphic 4 presented that the distribution of selected alumni who are currently working at health facilities in the country such as National Health Laboratory, National Institute of Pharmacy and Medical Devices Product, Referral hospitals, Community Health Centers and private clinics.

Moreover, the graphic also showed that from 34 selected alumni currently 10% with job, 40% with volunteers from 50% selected alumni.



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