ENGINEERING GRADUATES' EMPLOYABILITY OF HIGHER EDUCATION INSTITUTIONS IN TIMOR-LESTE

WITHING THE LAST 5 YEARS (2019-2023)

ANAAA RESEARCH

VOLUME III 2025

UNTL, DIT, UNPAZ, UNITAL, & UNDIL

Engineering Graduates' Employability of Higher Education Institutions in Timor-Leste within the Last 5 Years (2019-2023) (UNTL, DIT, UNPAZ, UNITAL, UNDIL)

Ruben Jeronimo Freitas, ST., M.Eng.Sc, Dr. Eng
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Dili, 2025

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REPÚBLICA DEMOCRÁTICA DE TIMOR-LESTE
MINISTÉRIO DO ENSINO SUPERIOR CIÊNCIA E CULTURA
MESCC

AGÊNCIA NACIONAL PARA A AVALIAÇÃO E ACREDITAÇÃO ACADÊMICA
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First and foremost, this work was funded by a research grant from ANAAA through ICNT; therefore, we would like to express our sincere gratitude to the Ministry of Higher Education, Science and Culture, the National Agency for Academic Accreditation and Evaluation (ANAAA), and the National Institute of Science and Technology (INCT) for entrusting us with this research. We are grateful for their continuous support and cooperation throughout the research process.

We would like to acknowledge all individuals who contributed to the completion of this study on the Engineering graduate employability in Timor-Leste.

Our special thanks to the enumerators and their respective university for the collaboration and provision of data relating to the engineering graduate students, which have been invaluable and vital to the success of this research.

Lastly, we would also like to express our gratitude to the all participants involved in this study, especially engineering graduates who completed their undergraduate study within period of 2019 to 2023 and the employers, especially EDTL, E.P., Timor Gap,E.P., Tsuneishi Timor Shipbuilding (TTS), and Ministry of Public Work (MOP). All of their feedbacks and recommendations has been substantial and significantly enhance the quality of this research.

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Ruben Jeronimo Freitas, ST., M.Eng.Sc, Dr. Eng
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MESSAGE FROM THE MINISTER OF HIGHER EDUCATION, SCIENCE AND CULTURE OF THE IX CONSTITUTIONAL GOVERNMENT, DEMOCRATIC REPUBLIC OF TIMOR-LESTE

It is with great satisfaction of this study on the " Engineering Graduates' Employability of Higher Education Institutions in Timor-Leste within the Last 5 Years (2019-2023) of UNTL, DIT, UNPAZ, UNITAL and UNDIL", promoted by the National Agency for Academic Assessment and Accreditation (ANAAA) in collaboration with the National Institute of Science and Technology (INCT).

In recent years, our country has seen significant transformations in the engineering sector that have influenced not only the infrastructure development of our country, but have also shaped the opportunities and challenges faced by graduates when entering the workforce.

This sector has faced numerous challenges, including rapid technological change, technological advancement and skill gaps. In response, our Higher Education Institutions have worked diligently to improve their curricula, ensuring that they align with the evolving needs of our industrial and infrastructure sectors. By fostering critical thinking, practical skills and a strong ethical framework, we sought to equip our graduates with the tools they needed to address these priority issues.

As we reflect on the last five years, it is clear that the employability of our engineering graduates is on an upward trajectory. However, we must remain vigilant. Future success will depend on continuous evaluation of curricula, collaboration with leaders in the industry and infrastructure sectors, and an ongoing commitment to innovation. It is critical that we continue to work together to address challenges and maximize opportunities in the engineering sector.

As Minister of Higher Education, Science and Culture, I reaffirm the commitment of the Government of Timor-Leste to continue to invest in strengthening higher education institutions, improving the quality of education, and promoting research that helps shape informed and sustainable public policies. I urge all involved – educators, policy makers, engineering institutions and professionals – to maintain collaboration to ensure the employability of our graduates. It is through this joint effort that we will be able to train not only competent professionals, but also agents of change who will inspire future generations to pursue careers with a significant impact on our society.

To conclude, I would like to express my thanks to ANAAA, the INCT and the institutional partners who participated in this study, which I hope will be a valuable tool to guide strategic decisions and promote constructive debates that strengthen the role of higher education in Timor-Leste's human development.

José Honorio da Costa Pereira Jerónimo, M.Si.
The Minister of Higher Education, Science, and Culture

MESSAGE FROM THE EXECUTIVE DIRECTOR OF ANAAA

On behalf of the National Agency for Academic Accreditation and Assessment (ANAAA), I would like to extend my deepest appreciation to the dedicated team behind the recent study on graduate employment within the realm of higher education in Timor-Leste. This critical research provides a comprehensive analysis of the labor market absorption rate for graduates in engineering fields from various universities across our nation, illuminating both the challenges and opportunities present in this vital sector.

At ANAAA, we are unwavering in our commitment to ensuring the quality and relevance of higher education in Timor-Leste. This undertaking is not only pivotal for the academic institutions but also essential for the broader socio-economic development of our country. The findings from this study align seamlessly with our mission to promote excellence, accountability, and continuous improvement within the higher education sector.

By delving into the employability of graduates, the study enables us to identify specific areas that require enhancement. It further allows us to strengthen curricula and improve the critical linkages between academia and industry. It is imperative that our educational programs are attuned to the evolving needs of the labor market, and this research serves as a vital tool in that endeavor.

The insights and recommendations gleaned from this study will be invaluable to ANAAA as we continue to refine our accreditation and assessment processes for higher education institutions. By integrating these findings into our operational framework, we can better align educational offerings with market demands, thereby increasing the employability prospects of our graduates.

I would also like to take this opportunity to express my heartfelt gratitude to the universities, employers, and graduates who participated in this study. Your contributions have been instrumental in providing a holistic view of the current landscape and future possibilities. Additionally, I commend the research team for their meticulous and dedicated work on this project. This collaborative effort manifests the commitment of all stakeholders to elevate the quality and relevance of higher education in Timor-Leste.

Together, we can forge a path toward a more prosperous future, ensuring that our graduates are not only well-educated but also well-prepared to meet the challenges of the labor market.

Thank you for your ongoing support and engagement in this crucial initiative.

Nilton Diamantino Paiva Mau, Ph.D.
Executive Director of ANAAA

MESSAGE FROM THE EXECUTIVE PRESIDENT OF THE INCT

Esteemed colleagues, distinguished guests, and all stakeholders in the realm of higher education in Timor-Leste were covering the Study Program of Engineering.

It is with great pleasure and immense pride that, on behalf of the National Institute of Science and Technology (INCT), present to you the findings of our comprehensive study entitled "Engineering Graduates' Employability of Higher Education Institutions in Timor-Leste within the Last 5 Years (2019-2023)". This vital research initiative, executed in collaboration with the National Agency for Academic Assessment and Accreditation (ANAAA), reflects our unwavering commitment to enhancing graduate employability within the engineering science sector and beyond.

We acknowledge the significant request from the Technical Secretariat of the Human Capital Development Fund (FDCH), which catalyzed this important project under the auspices of the INCT Strategic Plan. As part of our ongoing INCT Training and Research Program, this study exemplifies our dedication to advancing the fields of engineering science and technology while simultaneously fostering the development of human resources and institutional capacities across Timor-Leste.

At this juncture, I wish to extend my heartfelt gratitude to Dr. Nilton Paiva, the Executive Director of ANAAA, and his dedicated team. Their trust in the INCT to carry out this pivotal project is deeply appreciated. The insights garnered from this research hold profound significance for Higher Education Institutions (HEIs) throughout our nation. By analyzing how the labor market integrates and absorbs graduates, we are better equipped to identify both the challenges and opportunities that lie ahead. This study not only assesses the effectiveness of the professional pathways afforded by various academic programs but also highlights the critical need for alignment between educational outcomes and labor market demands.

The findings of this research endeavor are paramount for HEIs, governmental bodies, and organizations such as ANAAA. They serve as a foundational basis for formulating policies aimed at enhancing educational quality and relevance in our rapidly evolving societal context. Understanding the dynamics of graduate employability will enable us to respond proactively to the needs of our economy and workforce, ensuring that our higher education landscape remains robust and future-focused.

The INCT, established by Decree-Law No. 23/2014, is mandated to promote science, technology, and innovation (STI) in Timor-Leste. Our mission encompasses the development of both applied and theoretical research, the dissemination of research findings, and the accreditation of scientific publications within our national context. We are proud to collaborate with 18 HEIs, striving collectively for the enhancement of scientific inquiry and the formulation of effective public policies.

In our quest for excellence, we have also cultivated partnerships with esteemed institutions globally. Collaborations with universities such as the Singapore University of Social Sciences, Kanazawa University in Japan, and BRIN in Indonesia have enriched our research capabilities and broadened our horizons.

This five-year study commenced its journey with the involvement of five distinguished HEIs: the Universidade Nacional Timor Lorosa'e (UNTL), Dili institute of Technology (DIT), Universidade da Paz (UNPAZ), Universidade Oriental (UNITAL) and Universidade de Dili (UNDIL). I would like to express my profound gratitude to the rectors, vice-rectors, deans, and department heads of these institutions. Their unwavering cooperation and provision of critical data have been instrumental in bringing this study to fruition.

I would also like to extend my sincere thanks to the dedicated researchers who undertook this monumental task. A special acknowledgment goes to Dr. Ruben Jeronimo Freitas, our research team leader, whose exemplary leadership was pivotal in steering this project towards success. Additionally, I wish to recognize Dr. Junior Raimundo da Cruz and all researchers who contributed their expertise and diligence to this endeavor.

Last but certainly not least, I would like to express my deepest appreciation to the organizational structures of the INCT and the ANAAA. Your support and coordination have been invaluable, culminating in the successful execution of this research project.

Finally, let us embrace the insights derived from this study as a catalyst for transformative change in our higher education system. By addressing the challenges identified and leveraging the opportunities presented, we can enhance the employability of our graduates and ultimately contribute to the prosperity of Timor-Leste. Together, we have the power to shape a brighter future for our nation.

José Cornelio Guterres, Ph.D

Executive President of the INCT

EXECUTIVE SUMMARY

Overview and Objectives

This study examined the employability status of engineering graduates from five Higher Education Institutions (HEIs) in Timor-Leste, i.e., UNTL, UNITAL, UNPAZ, DIT, and UNDIL, over the five-year period from 2019 to 2023. The research was initiated due the recognition of a potential disconnects between higher education curricula and the labor market's evolving needs, which presents challenges for graduates in securing employment both the public and the private sectors.

The general objective was to analyze the transition process into the job market, measure graduate mobility, and identify the key factors, trends, and challenges influencing employability. The study employed a mixed-method design, using surveys (questionnaires) with a calculated sample size of 558 respondents from a total graduate population of 3,418 and interviews employers representing public and private sectors, i.e. EDTL, E.P, Timor Gap, E.P, Tsuneishi Timor Ship Building, and Ministerio das Obras Publicas.

Key Findings

Employability Status

- **Overall Employment:** The overall employment rate for engineering graduates across the five universities is 59.14%.
- **Institutional Performance:** UNTL graduates demonstrated the highest employment rate at 84.3%, followed by DIT at 73.2%.
- **Time to Job:** The majority of employed graduates (59.9%) secured a job under 1 year after graduation. However, a significant portion took longer, with 17.5% securing a job over one year, and 19.5% taking over two years.
- **Job Sector and Match:** The public sector remains the dominant employer, absorbing 38.6% of working graduates, with the private sector following at 30.2%. Crucially, a large majority of employed graduates (67.8%) reported a direct match between their work and their field of study.

Factors and Correlations

- **Job Alignment vs. Job Search Time:** There is a moderate to strong correlation (overall mean of +0.663) between the time taken to secure a job and the job's alignment with the graduate's field of study, suggesting that a longer job search often leads to a position that is a better fit for their qualifications.
- **Satisfaction and Knowledge:** Strong positive relationships were found between Job Match and Job Satisfaction (+0.809), and especially between Job Match and Applied Knowledge (+0.879), indicating that a relevant job significantly increases job satisfaction and the ability to apply academic knowledge.
- **Unemployment/Dissatisfaction:** Low salary was cited as the most significant factor for job dissatisfaction. Among unemployed graduates, the top reasons were "Cannot find a job" (26.8%) and "Did not interested in working" (25.7%).

Trends and Challenges

Employer Demand and Skill Gaps:

- **Comprehensive Skills:** Employers seek competent engineers who combine technical proficiency with strong soft skills, i.e., communication, teamwork, adaptability, and ethical behavior.
- **Practicality and Digitalization:** There is a high demand for graduates with a proven ability to apply theory (hands-on skills) and proficiency in digital and technical tools such as CAD, 3D modeling, and data analysis.
- **Curriculum Gaps:** Graduates strongly believe that universities need to add more subjects focused on practical experience and technical skills, such as; Practical Training and Computers to the curriculum. Employers confirm this, noting that many graduates lack practical experience, design skills, and exposure to real-world engineering tools.

Conclusions and Recommendations

The employability of engineering graduates is primarily shaped by their ability to apply foundational engineering knowledge through problem-solving, critical thinking, and hands-on competencies, which must be complemented by effective soft skills.

The main recommendations for improving graduate employability are:

For Higher Education Institutions (HEIs)

- **Strengthen Practical Training:** Integrate more laboratory work, fieldwork, industry projects, and mandatory internships.
- **Update Curriculum:** Include high-demand industry skills like CAD/3D modeling, programming, and specialized engineering software.
- **Integrate Soft Skills:** Introduce modules on communication, teamwork, problem-solving, and professional ethics.
- **Strengthen Partnerships:** Establish MoUs with industries for internships, guest lectures, and joint curriculum reviews.

For the Government (MESCC)

- Establish and socialize the new Decree law on the National Standard Curriculum for Higher Education, based on the Law No. 6/2024, 17 July 2024 for Higher Education.
- Promote the Triangle Partnership at inter-ministerial level and HEIs: Promote the policy of collaboration between the Government, Universities, and Industry to create a sustainable environment for graduate development and recruitment.

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ACRONYMS & ABBREVIATION

3D	3 Dimensional
ANAAA	Agência Nacional para a Avaliação e Acreditação Académica
CAD	Computer-Aided Design
DIT	Dili Institute of Technology
EDTL, E.P.	Eletricidade de Timor-Leste, Empresa Publica
HEIs	Higher Education Institutions
INCT	Instituto Nacional de Ciência e Tecnologia
INDMO	Instituto Nacional de Desenvolvimento de Mão- de- Obra
IT	Information Technology
MESCC	Ministério do Ensino Superior, Ciência e Cultura
n	Number of sample
r	Pearson corellation coefficient
RDTL	República Democrática de Timor-Leste
SEFOPE	Secretariat of State for Vocational Training and Employment
TTS	Tsuneishi - Timor Shipbuilding, Unipessoal, Lda.
UNDIL	Universidade Dili
UNITAL	Universidade Oriental Timor Lorosa'e
UNPAZ	Universidade da Paz
UNTL	Universidade Nacional Timor Lorosa'e
WIL	Work-Integrated Learning

INTRODUCTION

1.1 Background

Graduate employability is increasingly recognized as a key indicator of the effectiveness and responsiveness of higher education systems (Tomlinson, 2017). As a young and developing nation, Timor-Leste relies on its higher education institutions (HEIs) to play a strategic role in cultivating a skilled and adaptable workforce that supports the country's long-term development agenda (Government of Timor-Leste, 2011). HEIs are increasingly expected not only to impart academic knowledge but also to equip students with practical, transferable skills and competencies aligned with the evolving demands of the global and local labor markets (Knight & Yorke, 2004).

Higher Education Institutions (HEIs) in Timor-Leste are tasked with preparing graduates who possess the knowledge, skills, and attitudes required to thrive in the labor market. Engineering graduates, in particular, face the challenge of aligning their academic preparation with the realities of a labor market that demands technical expertise as well as adaptability, soft skills, and practical experience.

Over the past five years (2019–2023), Timor-Leste has witnessed a steady increase in the number of students graduating, which including engineering field from both public and private universities. While this growth represents progress in terms of educational access and participation, it also raises important questions about the quality and relevance of higher education. Many graduates face significant challenges in securing employment, particularly in sectors outside the public service, which has traditionally absorbed a large portion of the educated workforce. This mismatch between graduates' qualifications and available job opportunities points to a potential disconnect between higher education curricula and the evolving needs of the labor market.

This study examines the employability of engineering graduates from five universities, such as; Universidade Nacional Timor Lorosa'e (UNTL), Universidade Oriental Timor Lorosa'e (UNITAL), Universidade da Paz (UNPAZ), Dili Institute of Technology (DIT), and Universidade de Dili (UNDIL), over the past five years (2019–

2023). In particular, it aims to analyze employment rates, underemployment, job relevance, and the time it takes for graduates to find work after completing their studies. Additionally, the study investigates the role of various factors in shaping employability, including academic performance, field of study, soft skills, internships, language proficiency, and institutional support services such as career guidance and job placement programs. Furthermore, the research highlights systemic issues that may hinder graduate employability, such as limited private sector development, lack of industry-academia collaboration, and the absence of a national framework for tracking graduate outcomes. By drawing on data from graduate surveys, employer interviews, university records, and government labor statistics, the report aims to provide a comprehensive overview of the current state of graduate employability in Timor-Leste.

Ultimately, this study is intended to inform policymakers, educational leaders, and development partners about key gaps and opportunities in higher education and employment planning. Enhancing graduate employability requires a coordinated effort involving curriculum reform, labor market analysis, and the creation of pathways that connect education to employment.

1.2 Literature Review

Graduate employability is broadly defined as the ability of higher education graduates to obtain and maintain suitable employment, applying their knowledge, skills, and attitudes effectively in a dynamic labor market. According to Rowe and Zegwaard (2017), employability is not limited to academic qualifications; it encompasses professional skills, workplace readiness, and adaptability. Similarly, Cheng et al. (2022) emphasize that employability is shaped by the interaction of multiple stakeholders, i.e. universities, students, employers, and policymakers. While Studies highlight three broad domains influencing employability, i.e.;

1. Knowledge: Core subject knowledge acquired through formal education.
2. Skills: Both technical competencies (e.g., engineering design, problem-solving) and soft skills (e.g., communication, teamwork, leadership).
3. Attitudes: Professional behavior, motivation, adaptability, and lifelong learning mindset.

In the context of engineering, Sahudin et al. (2022) found that employers prioritize practical experience, critical thinking, and communication alongside technical expertise.

Globally, employers prioritize work readiness and transferable skills, often facilitated by work-integrated learning (WIL) initiatives (Rowe & Zegwaard, 2017). In Southeast Asia, studies such as Diem & Ha (2013) reveal persistent mismatches between academic preparation and market needs, resulting in unemployment or underemployment. In Timor-Leste, the National Employment Strategy 2017–2030 (RDTL, 2017) acknowledges challenges including limited job opportunities, insufficient vocational training, and a weak connection between higher education and the labor market. According to Young & Ernst (2018) and Gamito & Rei (2023), employers seek not only technical proficiency but also language skills, problem-solving ability, and adaptability. As Gamito & Rei (2023) observed, youth face higher unemployment rates, particularly in technical fields, due to limited industry absorption capacity. These challenges are further compounded by a lack of comprehensive graduate tracing studies, leaving policymakers with minimal evidence for decision-making.

While limited, existing studies provide important insights. Gomes & Carlos (2023; 2024) examined graduate absorption rates in health sciences and management, showing variability in employment outcomes depending on field of study and institution. Their findings suggest that employability challenges are systemic, where the problems related to finding and keeping jobs are broad, deep-rooted, and affect the whole system (such as; the education system, the job market, economic conditions, and policy) and not limited to a single discipline, making engineering graduates subject to similar trends.

Despite growing recognition of the issue, significant research gaps remain in Timor-Leste:

- Limited longitudinal studies tracing graduates' career outcomes.
- Insufficient analysis of employer expectations across technical fields.
- Lack of integration between academic institutions and the labor market.

This study seeks to address the above-mentioned gaps by focusing specifically on engineering graduates between 2019–2023, identifying employability trends, and proposing actionable recommendations.

1.3 Objective of the Study

1.3.1 General Objective

The overarching goal of this study is to analyze the employability of engineering graduates from Timor-Leste's higher education institutions (HEIs) within the period 2019–2023. Employability here is understood as not only the capacity of graduates to secure employment but also their preparedness to thrive in professional settings, meet industry expectations, and contribute effectively to national development.

1.3.2 Specific Objectives

1. Identify employability trends
   - Examine the employment outcomes of graduates across the five universities (UNTL, UNITAL, UNPAZ, DIT, and UNDIL).
   - Track the proportion of graduates who secure employment within specific time frames after graduation (e.g., within 6 months, 1 year).
   - Identify the fields or industries absorbing the largest number of engineering graduates.
2. Assess challenges and opportunities
   - Explore barriers faced by unemployed or underemployed graduates.
   - Highlight opportunities in the labor market for engineers, particularly in infrastructure, construction, and energy sectors.
3. Identify key factors influencing employability
   - Analyze the relative importance of technical skills, practical experience, soft skills, and personal attitudes.
   - Investigate the role of language proficiency, digital literacy, and entrepreneurial capacity.
4. Examine the employability status across institutions
   - Compare employability outcomes among graduates of different universities.
   - Evaluate the role of curriculum design and academic preparation in shaping job readiness.
5. Understand the transition process into the job market
   - Document the time elapsed between graduation and first employment.

- Explore how graduates secure jobs (e.g., through personal networks, internships, formal applications).
- Investigate whether graduates require further training or certification to meet employer requirements.

6. Measure graduate mobility
   - Assess whether graduates remain in Timor-Leste or seek opportunities abroad.
   - Explore their adaptability in moving across different sectors or regions.
7. Formulate recommendations
   - Provide actionable insights for universities to improve curricula, career services and partnerships with industry.
   - Suggest strategies for employers and policymakers to enhance graduate employability and workforce development.

RESEARCH METHODOLOGY

To gain insights into the employability of engineering graduates from higher education institutions in Timor-Leste, the study was conducted using an online survey targeting the year of 2019-2023 graduates from various engineering programs. The survey collected data on employment status, the relevance of current jobs to their field of study, and the graduates' perceptions of how well their education prepared them for the workforce. The data analysis was descriptive, focusing on identifying common trends such as the rate of employment within the first 5 year after graduation, types of industries employing engineering graduates, and gaps between academic training and job requirements. The results point to the need for stronger alignment between higher education curricula and labor market demands in Timor-Leste to improve graduate outcomes.

2.1 Research Design

This study adopted a mixed-method design approach, integrating quantitative and qualitative methods to obtain a comprehensive understanding of a research problem. This approach intends to balance the strengths of both types of data. Since the collected data from all type of methods sometimes has bias and weakness, hence, the use of the mix-method by collection of both quantitative and qualitative data may neutralize the weakness of each form of data (Creswell & Clark, 2018). Using mix-methods can deepen the understanding and improve validity of the result, therefore increasing the credibility of results (Schoonenboom & Johnson, 2017). Contrarily, Johnson et al. (2007, pp. 123-124) designed and elaborated the mixed-methods research into 3 different drives: Qualitative dominant (qualitative driven), Equal status, and Quantitative dominant (Quantitative driven). The qualitative dominant mixed methods research is the type of mixed research that rely dominantly on qualitative analysis, while the addition of quantitative data will be used to support the qualitative insight.

In this study, the qualitative method was dominantly used with the support of some quantitative data, therefore the qualitative-dominant mixed methods research for the study.

2.2 Research Process

The research flow diagram is shown in figure 2.1. In the start of the research (the conceptual phase), the problems will be defined and the review are done to the existing literatures. In the second phase, Design and Planning Phase, the research questions/hypotheses will be formulated, and deciding the plan on the study design, sample size and data analysis. The questionnaires were evaluated for the ethic compliance. The project management plan and effective scheduling are key factor for the research success.

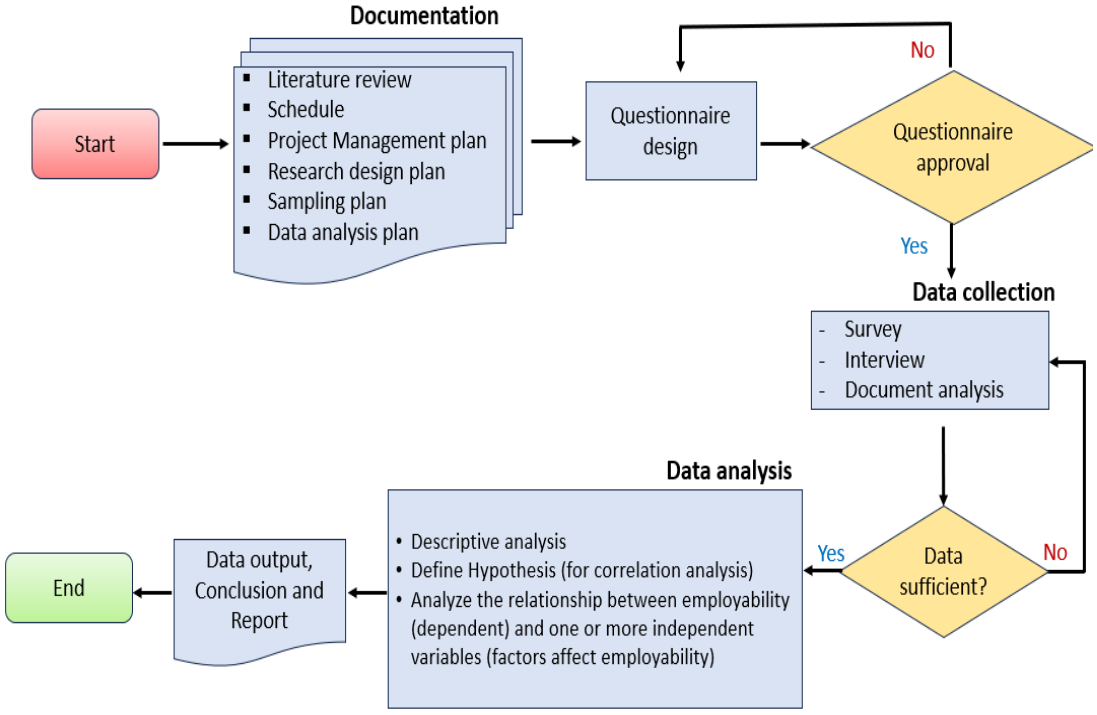


Figure 2.1 Research flow diagram

In the third phase, Empirical phase, the data will be collected through surveys or interviews. When the data meet the number of defined sample size, the research will proceed to the next phase, Analytic Phase. In the analytic phase, the collected data will be processed and analyzed based on defined analysis methods. The findings will be interpreted and the report will be written in the final phase, which is the Dissemination Phase.

2.3 Data Collection Methods

In this study, the primary data was collected though surveys and interviews, while the secondary data related to the number of engineering graduates within las five years (2019-2023) were collected from each university.

2.3.a) Surveys

The survey was specifically designed for four groups of graduates: Employed graduates, unemployed graduates, Employed graduates while continuing their study, and those who are currently continuing their study. The survey was conducted through online and offline questionnaire distribution to document graduates' information from selected 5 universities such as UNTL, DIT, UNPAZ, UNDIL and UNITAL. This information including graduates' demography which covers categories of personal and socioeconomic characteristic and other questions that were used to analyze the graduates' employability. The personal characteristics category consists of age, gender, education level, present address and working address, while socioeconomic characteristic consists of field of study, level of education, employment status, occupation, and income/salary.

In order to analyze the employability of engineering graduates the following questions were included in the questionnaire:

- After graduating, how long did it take you to get employed?
- Does your work match the field that you graduated from?
- To what extent can you apply knowledge from your field of study to your current job?
- Do you think which engineering skills helps you to get the job?
- Do you satisfy with your work? If not, please specify the most important reason.
- Are you thinking of going to work in another country?
- Are you interested in continuing your education (Master's or Doctorate)?
- Have you set your personal goal for your career development for 5-10 years coming?
- Are you currently undergoing any training?
- What skill do you feel needed to improve or develop further to succeed in your career?
- Please specify major reasons why you do not get a job after graduation?
- Who or what institutions do you think might link you to the job opportunities?
- What subjects or knowledge should be added to the Universities / institute's curriculum that will benefit your career even more?

- Suggestions about the major and program (if any)
- Suggestions about learning/teaching activities (if any)
- Suggestions about student activity (if any)

2.3.b) Interview

The interview is conducted to understand the employer's preferences relating to the generals and specifics criteria for graduates to be employed based on market demands. Four employers body representing both public and private sectors were picked to have their point of view related to the quality of graduates required to be employed by them, i.e., EDTL, E.P., Timor Gap, E.P., Tsuneishi Timor ShipBuilding, and Ministerio das Obras Publicas.

The main questions that asked to the employers were:

- How do you communicate a job vacancy in your office/company to the public?
- What qualities, abilities, and/or skills are you looking for when employing an engineering graduate?
- What specific skills are you seeking when you hire an engineering graduate?
- There are several factors that could be crucial when recruiting an engineering graduate. Please assist us in identifying the most significant elements for personnel selection by rating the importance of each factor.
- Are there any additional important skills not included above? If any, please rate the level of importance.

The information collected from survey and interview will be used to identify employability trends, assess challenges and opportunities, identify key factors influencing employability, examine the employability status across institutions, understand the transition process into the job market, and measure graduate mobility.

The number of engineering graduates within las five years (2019-2023) is shown in the Table 2.1. UNTL graduated 780 engineering students across 5 courses which are Mechanical engineering (108 graduates), Civil engineering (206 graduates), Electrical and Electronic Engineering (139 graduates), Informatics Engineering (167 graduates) and Geology & Petroleum (160 graduates). UNDIL graduated 294 engineering students across 2 courses which are Tecnica Industria (95 graduates) and Petroleo (199 graduates).

Table 2.1 Number of Engineering Graduates of 5 Higher Institutions (UNTL, UNDIL, DIT, UNITAL, and UNPAZ) from 2019-2023

		Graduation Year											
		2019		2020		2021		2022		2023			
Institution	**Study Program**	***M***	***F***	***M***	***F***	***M***	***F***	***M***	***F***	***M***	***F***	**Total Alumnae**	**TOTAL M/F**
UNTL	1 Mechanical Engineering	23	0	23	1	14	0	7	2	28	10	**108**	**780**
	2 Civil Engineering	29	3	13	5	34	13	30	4	63	12	**206**	
	3 Electrical and Electronic Engineering	40	3	15	3	11	0	18	1	37	11	**139**	
	4 Informatics Engineering	32	25	18	10	24	7	7	5	26	13	**167**	
	5 Geology & Petroleum	17	7	18	15	34	15	14	2	16	22	**160**	
UNDIL	1 Tecnica Industria	23	5	9	7	8	14	24	5	0	0	**95**	**294**
	2 Petroleo	22	19	22	11	29	29	47	17	2	1	**199**	
	3 Informatica	0	0	0	0	0	0	0	0	0	0	**0**	
DIT	1 Civil Engineering	35	6	36	16	48	13	44	8	40	17	**263**	**499**
	2 Computer Science	19	15	33	18	16	7	9	7	27	12	**163**	
	3 Mechanical Engineering	7	1	7	2	17	1	16	0	20	2	**73**	
UNITAL	1 Industrial Engineering	2	2	9	8	2	0	5	2	1	0	**31**	**528**
	2 Civil Engineering	47	6	34	3	10	0	15	2	6	2	**125**	
	3 Electrotechnics Engineering	2	1	2	0	7	3	7	0	0	0	**22**	
	4 Informatics and Computation Engineering	26	50	13	10	13	30	13	3	2	6	**166**	
	5 Geological Engineering	0	0	8	4	4	4	7	12	13	5	**57**	
	6 Petroleum Engineering	4	0	21	8	1	0	8	13	8	3	**66**	
	7 Mining Engineering	2	0	10	10	8	3	9	0	0	0	**42**	
	8 Architecture, Planning and Geodesy	0	0	0	0	0	0	10	2	4	3	**19**	
UNPAZ	1 Architecture	72	10	62	2	55	5	92	3	34	4	**339**	**1317**
	2 Industrial	31	7	29	11	22	5	16	1	23	4	**149**	
	3 Civil Engineering	194	30	179	39	100	12	110	8	132	25	**829**	

TOTAL 3418

DIT graduated 499 engineering students across 3 courses which are Civil Engineering (263 graduates), Computer Science (163 graduates) and Mechanical Engineering (73 graduates). UNITAL graduated 528 engineering students across 8 courses which are Industrial Engineering (31 graduates), Civil Engineering (125 graduates), Electrotechnics Engineering (22 graduates), Informatics and Computation Engineering (166 graduates), Geological Engineering (57 graduates), Petroleum Engineering (66 graduates), Mining Engineering (42 graduates), and Architecture, Planning and Geodesy (19 graduates).

UNPAZ graduated 528 engineering students across 3 courses which are Architecture (393 graduates), Industrial (149 graduates) and Civil Engineering (829 graduates).
The total engineering graduates from 5 universities within period of 2019-2023 are 3418 graduates.

2.4 Sampling Method and Sampling Size

In order to ensure that the survey results represent wider population, the suitable sampling method should be defined. In this research, since the study is focused on the engineering graduates across 5 different local universities in Timor-Leste, therefore, the stratified sampling was adopted. Using stratified sampling, population were divided into subgroups (strata) and then the samples were performed independently for each stratum to ensures the appropriately represented of all sample. By this, the more reliable and valid research findings can be obtained, especially with a diverse population. The categorical sample size formula of Cochran was used to determine sample size (Bartlett et al., 2001).

The Cochran formulas are as follow;

- The Cochran formula for infinity population:

$$n_o = \frac{Z^2 pq}{e^2}$$

- For finite population size, the Cochran correction will be used.

$$n_1 = \frac{n_o}{1 + n_o/N}$$

Where:

n_0 = Number of samples for infinite population;

N = Number of populations;

Z = Confidence level; Value for selected alpha level in each tail (Based on Z-table);

e = The desired level of precision (The margin of error);

p = The (estimated) proportion of the population which has the attribute in question;

$q = 1 - p$

pq = Estimated of variance

n_1 = required return sample size for finite population

This formula is ideal to calculate the ideal sample size for desire level of precision, especially for large populations. The formula consists of two main parts: for infinite population and for finite population. The finite population is used to adjusts the first result.

2.5 Data Analysis

The collected data were analyzed, computed and visualized graphically using statistical software. These Statistics analysis consists of:

- Descriptive Statistics

  This analysis will use various measures such as central tendency (mean, median) and variability (standard deviation, range) to describe the engineering graduates and employability data.

- Correlation analysis

The correlation analysis will be used to measure the direction and the degree of association between two or more variables. For example: whether there is a linear correlation between time for graduates to get the job and the job that match graduates' area of study or the correlation between Job match area of study, Job satisfaction, and Applied knowledge. The correlation can be positive or negative, and linear or non-linear correlation. In this study, we used Pearson correlation to calculate Pearson's coefficient (r) in order to measure the strength and direction of the two variables.

- Statistical significance

In order to confirm that the relationship of the variables was occurred by chance or not, we used statistical significance analysis to observe the significant relationship. The null hypothesis (H_0) and alternative hypothesis (H_1) will be defined as a starting point for statistical testing, which will be used as a claim for "no effect (no relationship)" or "there is an effect (there is a relationship)".

2.6 Ethical Considerations

The credibility of this study relies not only on methodological rigor but also on adherence to ethical standards. Since the research involves various participants, ethical guidelines are applied to ensure fairness, respect, and protection.

1. Protecting Research Participants
    - Informed Consent: Participants will be provided with clear explanations of the study's purpose, procedures, potential risks, and benefits. Consent will be voluntary and documented.
    - Voluntary Participation: No participant will be forced into participating. They may withdraw at any stage without penalty.
    - Confidentiality and Privacy: Personal identifiers will be removed from data, and all responses will be anonymized to ensure privacy.

- Minimizing Harm: Sensitive questions will be avoided, and participation will not expose individuals to psychological, social, or professional harm.

2. Ensuring Scientific Integrity
   - Honesty and Transparency: Data collection and analysis will be conducted truthfully without fabrication or manipulation.
   - Data Integrity: Records will be stored securely and analyzed systematically, ensuring accuracy and reliability.
   - Avoiding Plagiarism: Proper citations will be given to all referenced studies, ensuring intellectual honesty.
   - Balanced Reporting: Both positive outcomes and challenges will be reported objectively, avoiding bias.
3. Responsibility Toward Stakeholders
   - Graduates: The study will represent their voices fairly and provide insights into their challenges and successes.
   - Universities: Findings will be used constructively to recommend improvements, not to discredit institutions.
   - Employers: Feedback will be presented in a way that encourages collaboration rather than criticism.
   - Policymakers: Recommendations will be evidence-based, supporting informed decision-making for national workforce development.

RESULT AND DISCUSSIONS

3.1 Sampling size calculation

Based on the total 3418 graduates from 5 universities, the calculation for ideal sample size was done. Table 3.1 shows the Condition for Cochran sample size calculation. With desired level of confidence 99%, the Z-score is 2.58. Considering the desired level of precision or margin of error is 5%, The sample size was calculated with the following conditions:

Table 3.1 Condition for sample size calculation

Variables	Value
Number of population (*N*) :	3418
Confidence Level (1-*alpha*):	99%
Z-Score (*Z*) :	2.58
Margin of Error (*e*) :	0.05
Population Proportion (*p*) :	0.5
1-p (*q*) :	0.5
Sampling method :	**Stratified sampling**

Using the Cochran formulas, the calculated ideal sample size n_1 is 558 samples (respondents). Since this sample size need to represent all graduates of five universities, hence the stratified sampling was used to distribute the sample size based on the proportional allocation. Then the allocated portion will be stratified again and allocated proportionally for each study program.

The stratified sampling with proportional distribution for each university and each study program is shown in the Figure 3.2. The 558 samples were stratified and allocated to each university as with the share as follow: 127 (22.8%) samples for UNTL, 48 (8.6%) samples for UNDIL, 82 (14.6%) samples for DIT, 68 (15.5%) samples for UNITAL and 215 (38.5%) sample for UNPAZ.

Considering that some respondent might not fill the questioner properly or there might be some respondent that will respond twice or more, hence we considered to add 10% to the calculated sampling size for each study program.

Table 3.2 Stratified sampling for each Institutions and study programs

Institution		Study Program	Total Alumnae	Percent allocation (%)	Number of Sample	TOTAL Alumnae M/F	Number of Sample for each program
UNTL	1	Mechanical Engineering	780	**22.8%**	**127**	108	***18***
	2	Civil Engineering				206	***34***
	3	Electrical and Electronic Engineering				139	***23***
	4	Informatics Engineering				167	***27***
	5	Geology & Petroleum				160	***25***
UNDIL	1	Tecnica Industria	294	**8.6%**	**48**	95	***16***
	2	Petroleo				199	***32***
	3	Informatica				0	***0***
DIT	1	Civil Engineering	499	**14.6%**	**82**	263	***43***
	2	Computer Science				163	***27***
	3	Mechanical Engineering				73	***12***
UNITAL	1	Industrial Engineering	528	**15.5%**	**86**	31	***5***
	2	Civil Engineering				125	***20***
	3	Electrotechnics Engineering				22	***4***
	4	Informatics and Computation Engineering				166	***27***
	5	Geological Engineering				57	***9***
	6	Petroleum Engineering				66	***11***
	7	Mining Engineering				42	***7***
	8	Architecture, Planning and Geodesy				19	***3***
UNPAZ	1	Architecture	1317	**38.5%**	**215**	339	***55***
	2	Industrial				149	***24***
	3	Civil Engineering				829	***135***
		Total	3418	**100%**	**558**		

3.2 The cumulative number of respondents from the online survey

The cumulative number of engineering graduate who participate in the online employability trace survey is 759 respondents out of 3418 graduates across 5 selected universities. Considering the number of samples required (558 samples) is less cumulative respondents of online survey (759), hence the stratified sampling was used to sample the 759 samples to 558 based on the proportional allocation. The further random sampling was applied to each university to randomly sample the number respondent to be allocated to each study programs.

3.3 Demographic Profile of Engineering Graduates Employment status

3.3.1 Age distribution of engineering graduates

The graph in Figure 3.1 shows the variability in the age distribution of engineering graduates from the five HEIs that participated in the study. With the sample size of 558, most of the respondents are concentrated in the Age range group of 26-30, with 352 respondents (63.1%), representing graduates in the early stages of their professional careers.

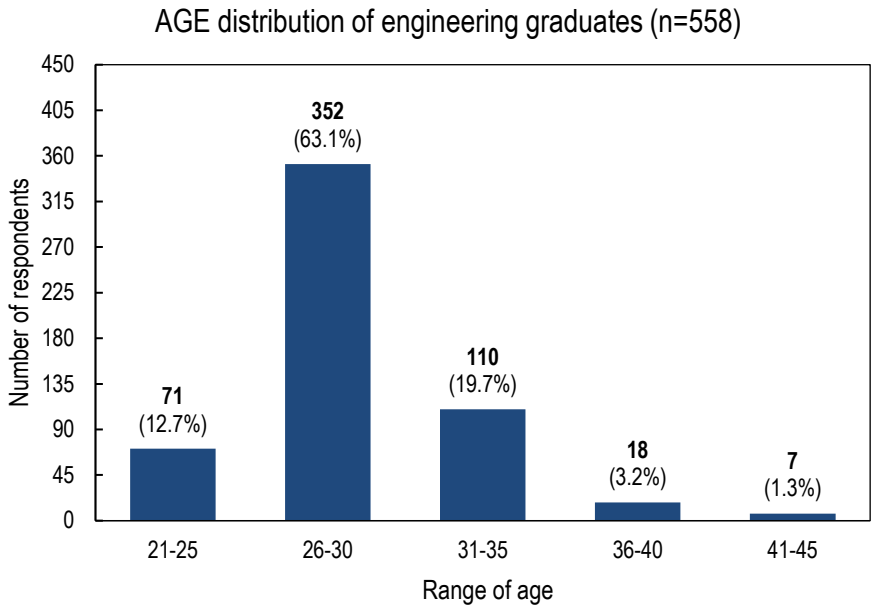


Figure 3.1 AGE distribution of engineering graduates (n=558)

The second largest group of respondents is from the age group of 31-35, with 110 respondents (19.7%), representing graduates who entered their engineering programs later, took longer to complete their degrees. The third large group is from the age group of 21-25 (12.7 %), reflecting the typical graduation age for engineering programs, which is generally between 4-5 years. The last group with a small portion of the total sample represented older engineering graduates with the range of ages between 36-40 with 18 respondents (3.2 %) and 41- 45 with 7 respondents (1.3 %).

Key finding:

Most of the engineering graduates are concentrated in the Age range group of 26-30, with 352 respondents (63.1%), representing graduates in the early stages of their professional careers.

3.3.2 Graduates employment status based on class of age

The Table 3.3 shows the categorization of the graduate's employment status based on the respondents' class of age distribution. With the sample size of 558 respondents, 330 graduates (59.14%) are currently employed, 190 graduates (34,05 %) are unemployed, while 20 respondents (3,58 %) are continuing their study to the higher level of education, and 18 respondents (3,23 %) are employed and continuing their study.

The data reveals the higher numbers of each category are concentrated in the 26–30 age range of their respective total numbers, where 213 respondents (64,5 %) are employed, 115 respondents (60,5 %) are unemployed, while 15 respondents (75 %) are continuing their study, 9 respondents (50,0 %) are employed while continuing their study. The data also reveals the second highest for each category, respectively, are; employed category (23,3 %) is the age range of 31-35, unemployed category (15,3 %) and continue study (15 %) are the age range of 21-25, and employed while continuing study (22,2%) is the age range of 36–40.

Table 3.3 Categorization of the graduate's employment status based on the respondents' class of age distribution

Class of age	Employed (n=392)		Unemployed (n=190)		Continue Study (n=20)		Employed and Continue study (n=19)	
21-25	30	9.1%	36	18.9%	3	15.0%	2	11.1%
26-30	213	64.5%	115	60.5%	15	75.0%	9	50.0%
31-35	77	23.3%	29	15.3%	1	5.0%	3	16.7%
36-40	8	2.4%	6	3.2%	0	0.0%	4	22.2%
41-45	2	0.6%	4	2.1%	1	5.0%	0	0.0%
Total	**330**	100%	**190**	100%	**20**	100%	**18**	100%

Key finding:

Higher numbers of each category are concentrated in the 26–30 age range of their respective total numbers, where 213 respondents (64,5 %) are employed, 115 respondents (60,5 %) are unemployed, while 15 respondents (75 %) are continuing their study, 9 respondents (50,0 %) are employed while continuing their study.

3.3.3 Respondent frequency based on their graduation year

The graph in the Figure 3.2 shows the distribution of respondents' graduation years in the study on engineering employability in higher education institutions (HEIs). Of the 558 graduate respondents, 105 (18.82%) completed their degrees in 2019, 54 (9.68%) in 2020, 61 (10.93%) in 2021, 183 (32.80%) in 2022, and 155 (27.78%) in 2023. The highest respondents of this study are those who graduate in 2022 and 2023.

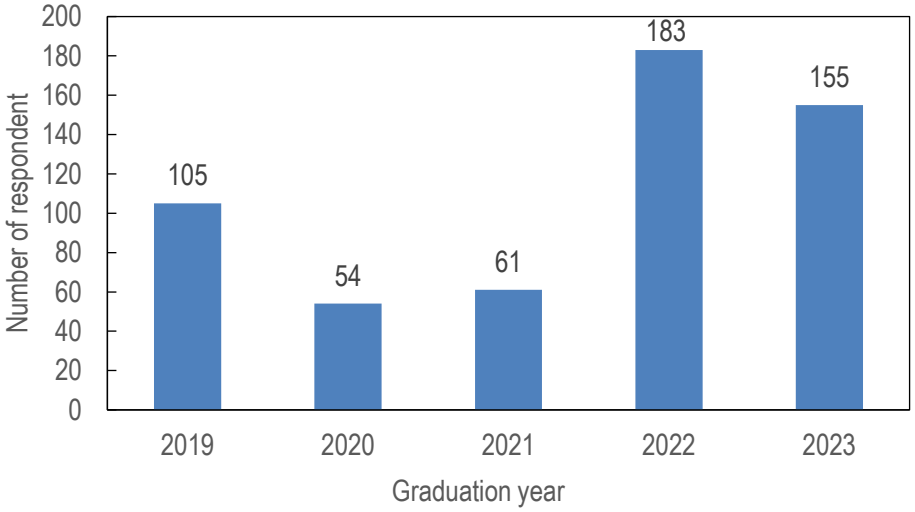


Figure 3.2 Distribution of respondents' graduation years in the study on engineering employability in higher education institutions (HEIs) (n=558)

3.3.4 Employment status by gender of engineering graduates

In this study, analyzing the data by gender are important for promoting social equity. The graph in Figure 3.3 shows the detailed categorization of the graduate's employment status based on the gender balance.

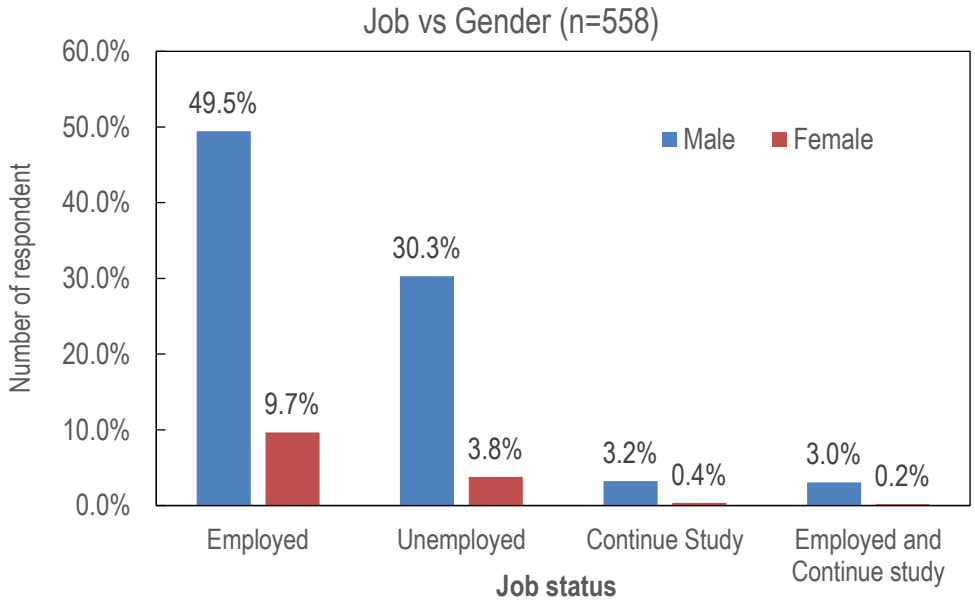


Figure 3.3 Categorization of the graduates employment status based on the gender balance. (n=558)

With the sample size of 558 respondents, the statistic shows almost half of the total respondents 276 male (49,5%) and 54 female respondents (9,7 %) are currently employed, 169 male graduates (30,3 %) and 21 female respondents (3,8 %) are unemployed. Furthermore, 18 male (3,2 %) and 2 female respondents (0,4 %) are continuing their study to the higher level of education, and 17 male (3,0 %) and 1 female respondents (0,2 %) are employed while continuing their study.

Key finding:

- Overall engineering graduates from 5 institutions exhibit a significant skew towards male respondents in the sample population.
- Out of 558 total respondents, 480 (86.02%) are Male and only 78 (13.98%) are Female.
- The data showed that labor force participation rate is higher (49.5%) for male graduates compared to female graduates (9.7%).
- Even though the employment rate is higher for males, they also contribute in higher unemployment rate (30.3%) compared to female (3.8%)

3.3.5 Engineering graduates of 5 universities employability status

The chart in Figure 3.4 shows the distribution of Engineering graduates from five faculties of engineering in the respective five universities. With the sample size 558, almost 60% of graduates are absorbed into the labor market. 34 % are unemployed, 3,58 % are continuing their study, and 3, 23% are employed while continuing their study.

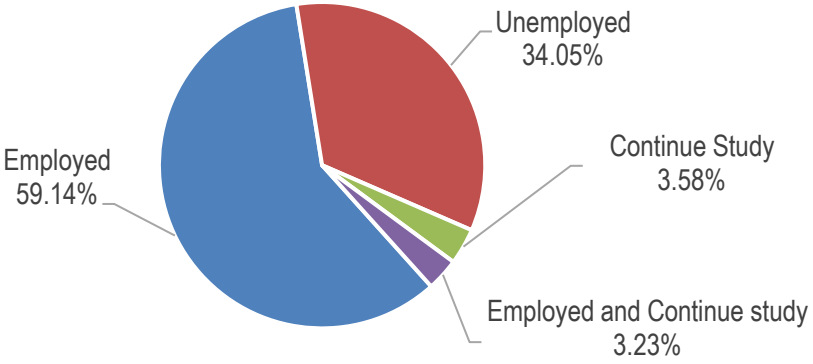


Figure 3.4 The distribution of Engineering graduates from five faculties of engineering in the respective five universities (n=558)

The breakdown of the employment status of engineering graduates of each university is shown in the chart bar of the Figure 3.5 with the percentage distribution of respondents is shown in the table 3.4. It compares the **employment status** of **engineering graduates** from five different universities: **UNTL**, **DIT**, **UNPAZ**, **UNITAL**, and **UNDIL**.

The data show that UNTL has the Highest employment rate, confirming its strong performance with 107 graduates (84,3 %) are employed. DIT is Second-highest employment rate with 60 respondents (73,2 %).

UNITAL has the third-highest employment rate despite having a very small number of respondents 47 (61,7 %), UNDIL has 38 graduates employed (42,1%). UNPAZ, although it had a high *number* of 84 employed graduates (39,1 %), however, this represents the smallest *proportion* of its very large respondents (215). Meanwhile, UNPAZ has the highest unemployment rate as more than half of its respondents are unemployed (55,8 %), followed by UNDIL (47,4 %), UNITAL (27,7 %), DIT (17,1 %), and UNTL (11,0 %). Furthermore, for **Continue Study** and **Employed and Continue study** remain low across each university, supporting the bar chart's indication that most graduates fall into the fully Employed or Unemployed categories. **DIT** has the highest percentage for **Continue Study** (6.1%), while **UNDIL** has the highest percentage for **Employed and Continue study** (7.9%).

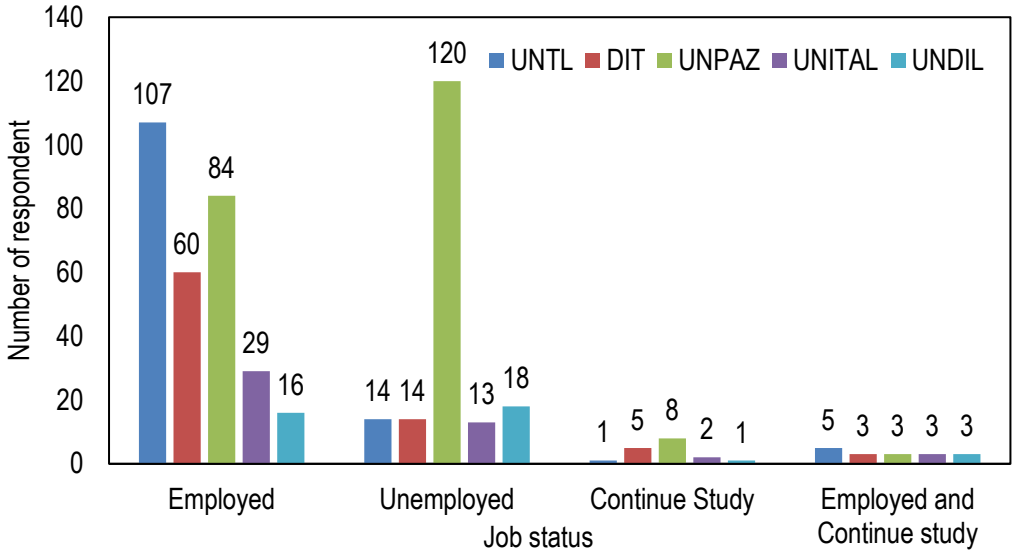


Figure 3.5 The distribution of Engineering graduates of respective five universities

Table 3.4 The percentage distribution of Engineering graduates of respective five universities

	Total respondent	Employed	Unemployed	Continue Study	Employed and Continue study
UNTL	127	84.3%	11.0%	0.8%	3.9%
DIT	82	73.2%	17.1%	6.1%	3.7%
UNPAZ	215	39.1%	55.8%	3.7%	1.4%
UNITAL	47	61.7%	27.7%	4.3%	6.4%
UNDIL	38	42.1%	47.4%	2.6%	7.9%

Key finding:

- The data show that UNTL has the highest employment rate with 84,3 % are employed. While, DIT is Second-highest employment rate with 73,2 % are employed.
- Continue Study and Employed and Continue study remain low across each university.
- DIT has the highest percentage for Continue Study (6.1%), while UNDIL has the highest percentage for Employed and Continue study (7.9%).

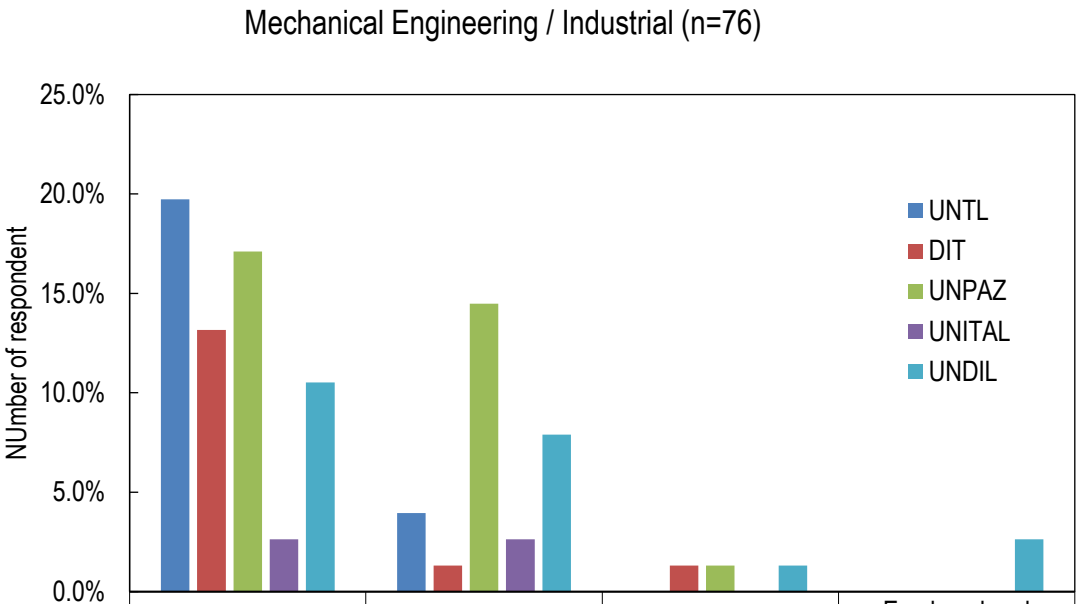
3.3.6 Employment status by study programs

Among faculty of engineering of 5 universities, there are 5 similar study programs offered, namely, Mechanical engineering and Industrial engineering which are offered by all 4 universities, Civil engineering which is offered by 4 universities (UNTL, DIT, UNPAZ and UNITAL), Electronic and Electrical / Electrotechnics Engineering offered by 2 universities (UNTL and UNITAL), Informatics Engineering and Computer Science offered by 2 universities (UNTL, DIT) and Architecture which is offered by 2 universities (UNPAZ and UNITAL). This study compares employment status of similar study program and result are presented as follow;

- Mechanical Engineering and Industrial Engineering

The chart bar (Figure 3.6) and the pie chart (Figure 3.7) show the breakdown of the employment status of engineering graduates by study program. The bar chart shows comparison of employment status of **Mechanical Engineering** and **Industrial Engineering** for each 5 universities, while pie chart shows the comparison of the employment status of engineering graduates of Mechanical Engineering and Industrial Engineering from five different universities: **UNTL, DIT, UNPAZ, UNITAL, and UNDIL.**

The Pie chart shows the general distribution of Mechanical and Industrial engineering graduates employment status with the sample size of 76 respondents. It shows that 63% graduates are employed, 30 % are unemployed. Meanwhile, only 4% continue their study, and 3 % with the status of employed while continuing their study.



	Employed	Unemployed	Continue Study	Employed and Continue study
UNTL	19.7%	3.9%	0.0%	0.0%
DIT	13.2%	1.3%	1.3%	0.0%
UNPAZ	17.1%	14.5%	1.3%	0.0%
UNITAL	2.6%	2.6%	0.0%	0.0%
UNDIL	10.5%	7.9%	1.3%	2.6%

Figure 3.6 Comparison of employment status of Mechanical Engineering and Industrial Engineering from 5 different universities (n=76)

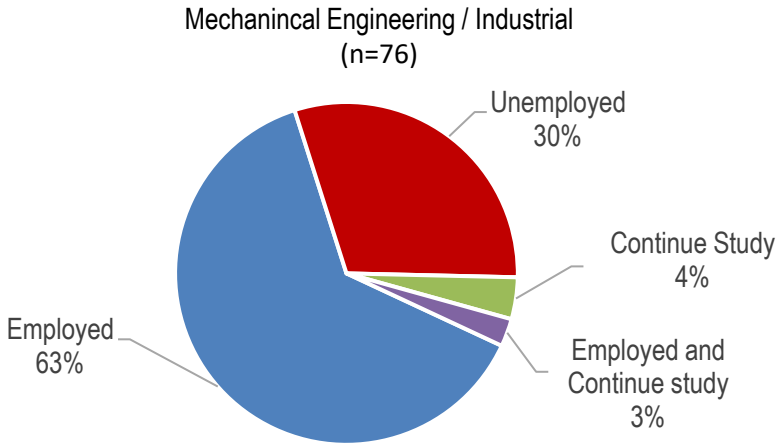


Figure 3.7 Overall employment status distribution in area of Mechanical and Industrial engineering.

The data show that Mechanical Engineering of UNTL has the highest employment rate 19,7% are employed, followed by Mechanical Engineering graduates from DIT in Second-highest employment rate with 13,2 %. For Industrial Engineering, graduates from UNPAZ have the highest employment rate 17,1 %, followed by UNDIL with 10,5 %, and the lowest absorption rate into labor market is UNITAL with 2,6 %. Meanwhile, UNPAZ has the highest unemployment respondents (14,5 %), followed by UNDIL (7,9 %), and UNITAL (2,6 %), DIT (17,1 %), and UNTL (10,9 %). Furthermore, **DIT, UNPAZ, and UNDIL** have the same percentage for **Continue Study** (3.1%), while from both program of studies only **UNDIL** has 2,6 % for **Employed and Continue study** (7.9%).

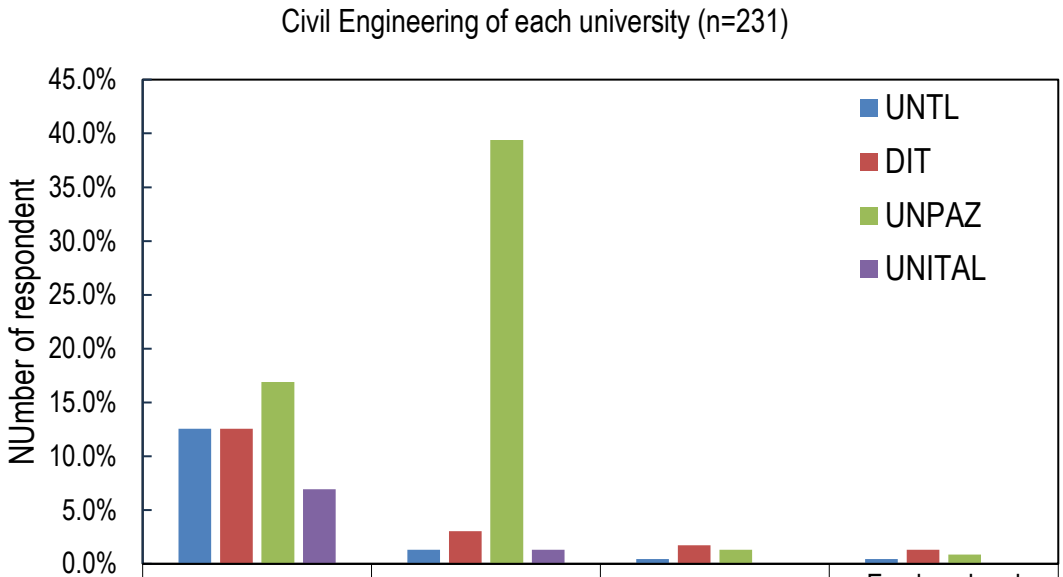
Key finding:

- The data showed Mechanical Engineering of UNTL has the highest employment rate (19,7%), followed by DIT graduates in Second-highest employment rate (13,2 %.)
- For Industrial Engineering, graduates from UNPAZ have the highest employment rate (17,1 %), followed by UNDIL (10,5%), and the lowest absorption rate into labor market is UNITAL (2,6 %).
- DIT, UNPAZ, and UNDIL have the same percentage for Continue Study (3.1%) for Mechanical engineering and Industrial engineering graduates

- Civil Engineering

The next chart bar (Figure 3.8) and the pie chart (Figure 3.9) show the breakdown of the employment status of engineering graduates by study program of Civil Engineering. It compares the **employment status** of **engineering graduates** of Civil Engineering available in four different universities: **UNTL**, **DIT**, **UNPAZ**, and **UNITAL**.

The Pie chart shows the general distribution of civil engineering graduates employment status with the sample size of 231 respondents. It shows that almost half size of respondents 48,9 % graduates are employed, and relatively closer to the half size 45 % are unemplyed. Meanwhile, the small percentage 3,5 % continue their study, and 2,5 % with the status of employed while continuing their study.



	Employed	Unemployed	Continue Study	Employed and Continue study
UNTL	12.6%	1.3%	0.4%	0.4%
DIT	12.6%	3.0%	1.7%	1.3%
UNPAZ	16.9%	39.4%	1.3%	0.9%
UNITAL	6.9%	1.3%	0.0%	0.0%

Figure 3.8 Comparison of employment status of Civil Engineering from 4 different universities (n=231)

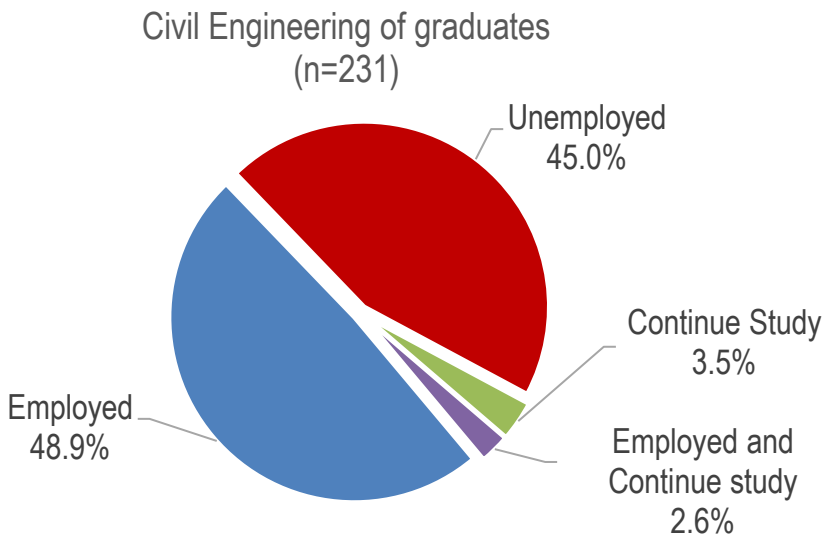


Figure 3.9 Overall employment status distribution in area of Civil engineering.

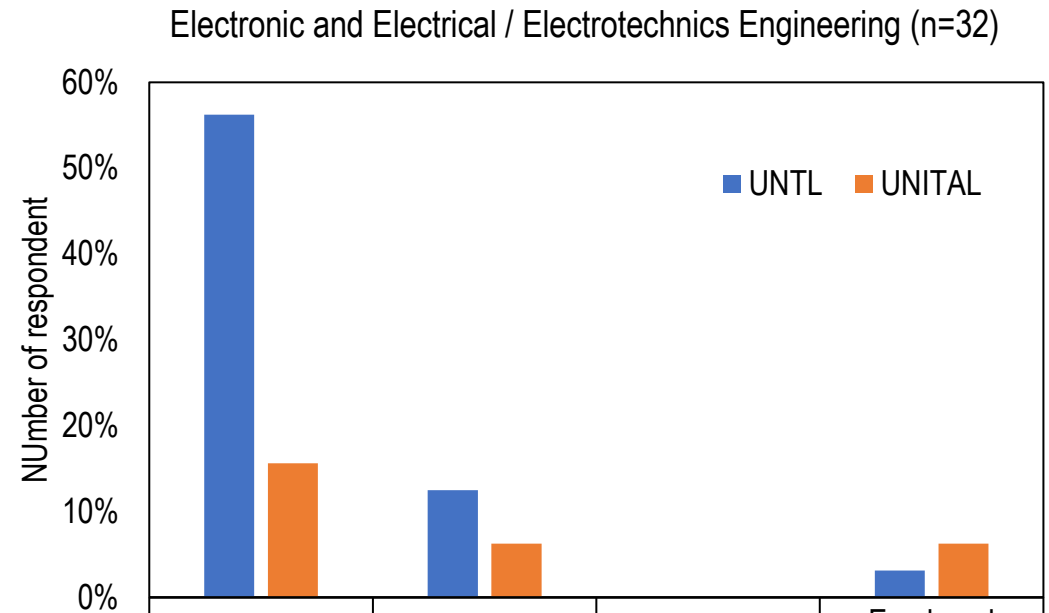
The breakdown part in the chart bar shows that Civil Engineering graduates of UNPAZ has the highest employment rate 16,9 % are employed, followed by both the Civil Engineering graduates from UNTL and DIT in Second-highest employment rate with 12,6 %, and the lowest employment rate is UNITAL with 6,9 %. Meanwhile, UNPAZ has the highest unemployment respondents which doubled from its employment rate (39,4 %), followed by DIT (3,0 %) and, UNTL and UNITAL with both have 1,3 % graduates unemployed. For the category of continuing study, DIT has the highest percentage (1,7 %), followed by UNPAZ (1,3 %), and UNTL (0,4 %). For the category of Employed and Continue study, DIT has the highest percentage (1,3 %), followed by UNPAZ (0,9 %), and UNTL (0,4 %).

Key findings:

- The data showed that civil engineering graduates of UNPAZ has the highest employment rate (16,9 %), followed by both the Civil Engineering graduates from UNTL and DIT with 12,6 %
- For the category of both continuing study and employed while continued study, DIT has the highest percentage, followed by UNPAZ and UNTL

- Electronic and Electrical / Electrotechnics Engineering

The respondents result from study program of Electronic and Electrical engineering from UNTL and Electrotechnics form UNITAL show in bar chart in Figure 3.10. The result shows that graduates from Electronic and Electrical engineering of UNTL has the highest employment rate, 56.3%, compared to the similar study program of UNITAL (Electrotechnics Engineering), which is only 15.6%. In case of the unemployment, UNITAL has lower percentage (6.3%) compared to the 12.5% of UNTL graduates. Based on the result, some of respondents from both study programs employed while continuing their study. The data shows that's UNITAL in double the percentage (6.3%) of respondents who are employed while continuing their study compared to UNTL (3.1%). Overall, of 32 respondents, 71.9% are employed, 18.8% are unemployed while 9.4% are employed while continuing their study.



	Employed	Unemployed	Continue Study	Employed and Continue study
UNTL	56.3%	12.5%	0.0%	3.1%
UNITAL	15.6%	6.3%	0.0%	6.3%

Figure 3.10 Comparison of employment status of Electronic and Electrical / Electrotechnics Engineering of UNTL and UNITAL

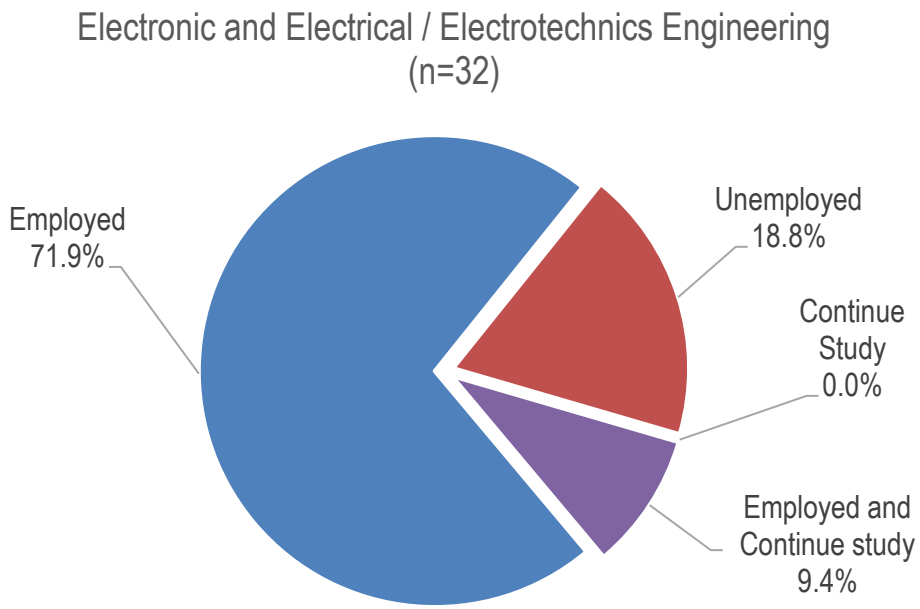


Figure 3.11 Overall employment status distribution in area of Electronic and Electrical / Electrotechnics Engineering

Key finding:

- Electronic and Electrical Engineering graduates of UNTL has the highest employment rate of 56.3 % are employed, while Electrotechnics graduates from UNITAL with 15.6 %,
- UNTL has the highest unemployed with 12,5 % of respondents, compared to 6.3% of UNITAL graduates
- Meanwhile, UNITAL double the percentage (6.3%) of respondents who are employed while continuing their study compared to UNTL (3.1%)

- Informatics Engineering and Computer Science

The next chart bar in Figure 3.12 and the pie chart in Figure 3.13 show the breakdown of the employment status of engineering graduates by study programs of Informatics Engineering, and Computer Science. It compares the **employment status** of **engineering graduates** of three different universities, i.e., **UNTL**, and **DIT**, that provides the two programs of studies.

The Pie chart shows the general distribution of both Informatics Engineering, and Computer Science graduates employment status with the sample size of 54 respondents. It terms of percentage it shows the highest percentage of 79.6 % are employed in comparison to other programs under the study, while 16,7 % are unemployed. Furthermore, there are 3,7 % are are employed while continuing their study.

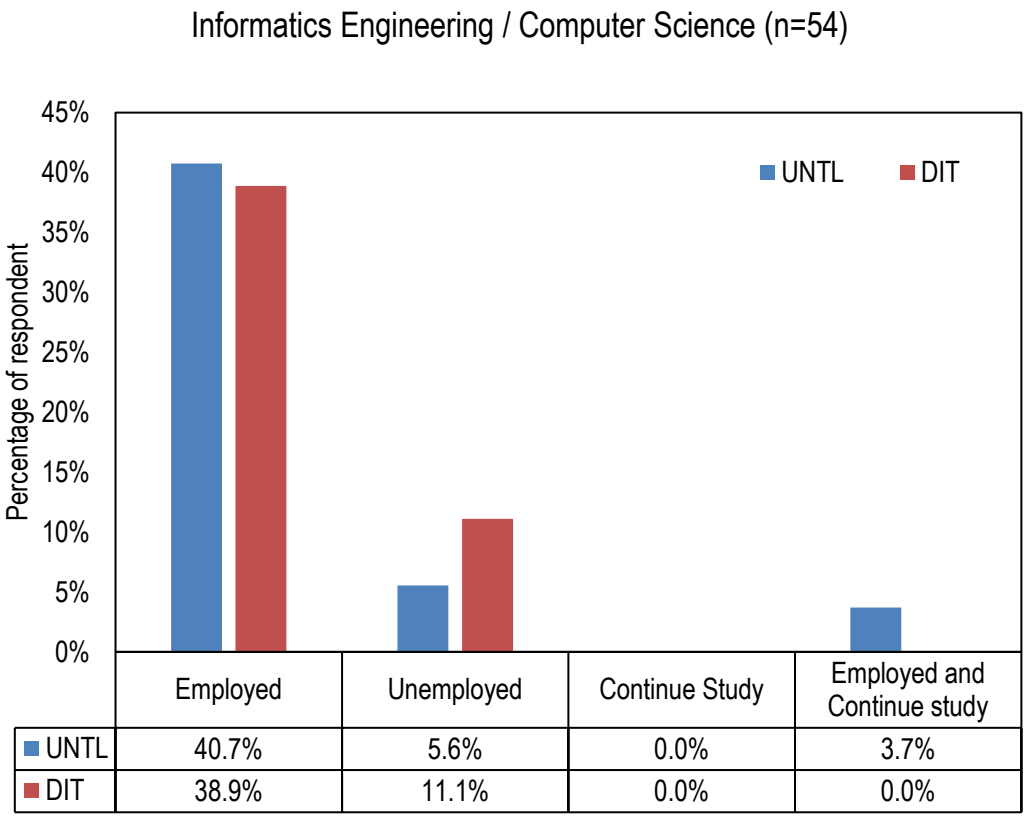


Figure 3.12 Comparison of employment status of Informatics Engineering / Computer Science of each university from different universities (n=54)

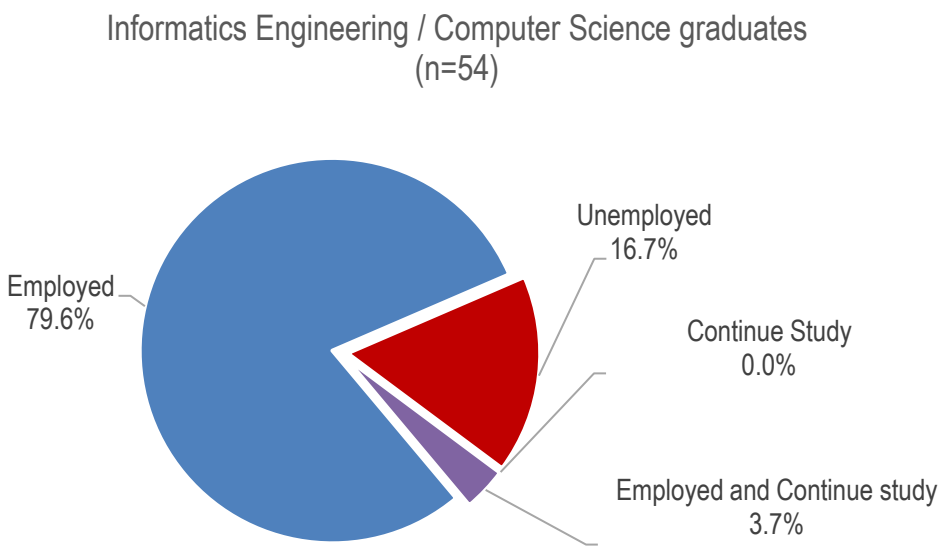


Figure 3.13 Overall employment status distribution in area of Informatics Engineering / Computer Science graduates (n=56)

The breakdown part in the chart bar shows that Informatics Engineering graduates of UNTL has the highest employment rate of 40.7 % are employed, followed by Computer Science graduates from DIT with 38,9 %. There is similar study program offered by UNITAL which is Informatics and Computation Engineering, however, the it was not included in this analysis since the collected sample for this study program is not met minimum sample requirement, hence excluded from the analysis. For the category of unemployed graduates, DIT has the highest unemployed with 11,1 % of respondents, followed by UNTL with 5,6 %. Meanwhile, only UNTL with 3,7 % of respondents who are employed while continuing their study.

Key finding:

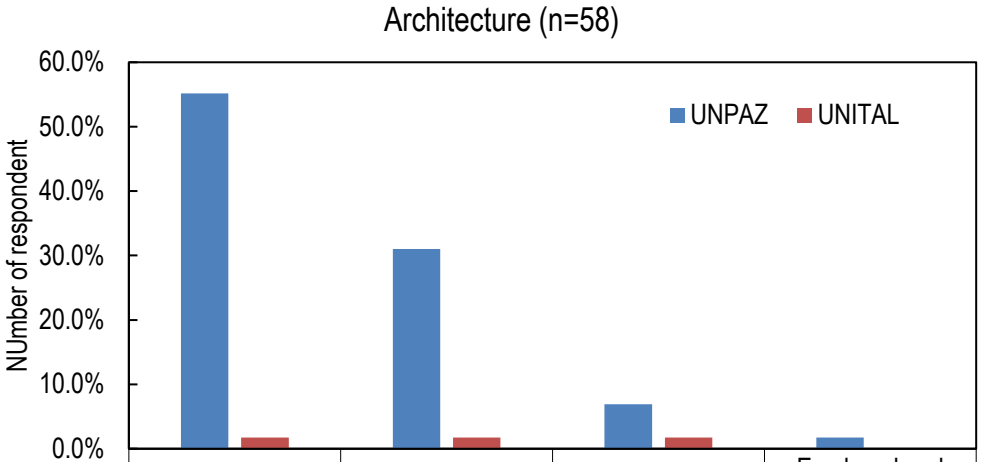
- Informatics Engineering graduates of UNTL has the highest employment rate of 40.7 % are employed, followed by Computer Science graduates from DIT with 38.9 %,
- DIT has the highest unemployed with 11,1 % of respondents, followed by UNTL with 5,6 %.
- Meanwhile, only UNTL with 3,7 % of respondents who are employed while continuing their study.

- Architecture

The breakdown of the employment status of engineering graduates by study program of Architecture is shown in the Figure 3.14 (chart bar) and Figure 3.15 (the pie chart). It compares the employment status of engineering graduates of **Architecture** available in two universities that offered the course, i.e., **UNPAZ,** and **UNITAL**.

The Pie chart shows the general distribution of Architecture graduates employment status with the sample size of 58 respondents. It shows that more than half size of respondents 56,9 % graduates are employed, and 32,8 % are unemplyed. Meanwhile, relatively big percentage of 8,6 % in comparison to other program of studies are continuing their study to the higher level of education, and 1,7 % with the status of employed while continuing their study.

The breakdown part in the chart bar shows that the Architecture graduates of UNPAZ has the highest employment rate 55,2 % are employed, and the unemployed graduates of 31,0 %. Furthermore, relatively high number of 6,9 % are continuing their study, and 1,7 % are employed while continuing their study. On the other hand, UNITAL has the small percentage of 1,7 % graduates employed, and the same figure of 1,7 % for both categories of unemployed graduates and continuing their study.



	Employed	Unemployed	Continue Study	Employed and Continue study
UNPAZ	55.2%	31.0%	6.9%	1.7%
UNITAL	1.7%	1.7%	1.7%	0.0%

Figure 3.14 Comparison of employment status of Architecture of each university from different universities (n=58)

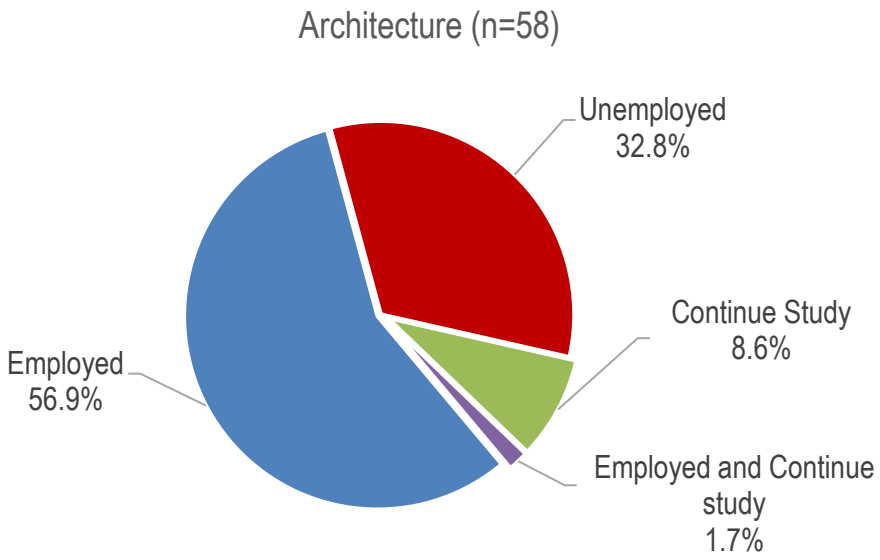


Figure 3.15 Overall employment status distribution in area of Architecture

Key finding:

- Architecture graduates of UNPAZ have the highest employment rate 55,2 % are employed compared to UNITAL that only 1.7%
- Relatively high number (6,9 %) of UNPAZ Architecture graduates are continuing their study, and 1,7 % are employed while continuing their study.
- UNITAL has the small percentage of 1,7 % graduates employed, and the same figure of 1,7 % for both categories of unemployed graduates and continuing their study.

3.4 Time to get the JOB

The time it takes to get a job after graduation is considered important because it can affect the long-term career implication. It will be the graduate's first experience to showcase his skill, which will be a building foundation for future career. Hence this study observed the time for engineering graduate to be employed.

The horizontal bar chart in Figure 3.16 describes the distribution of the time taken for 297 respondents of engineering graduates to obtain a job after graduation, in some cases, before

or during study, from five different HEIs. The bar chart shows that 19,5 % of graduates took more than two years to obtain the job, more than one year is 17,5 %. There are graduates who obtained the job relatively faster within the range of 1-year period, including graduates who are employed before graduated. Universities with high employment rates appear to be successfully facilitating their graduates' transition into the job market. However, even within these high-performing graduate groups, a considerable proportion of graduates' likely experience the extended job-search periods reflected in this chart.

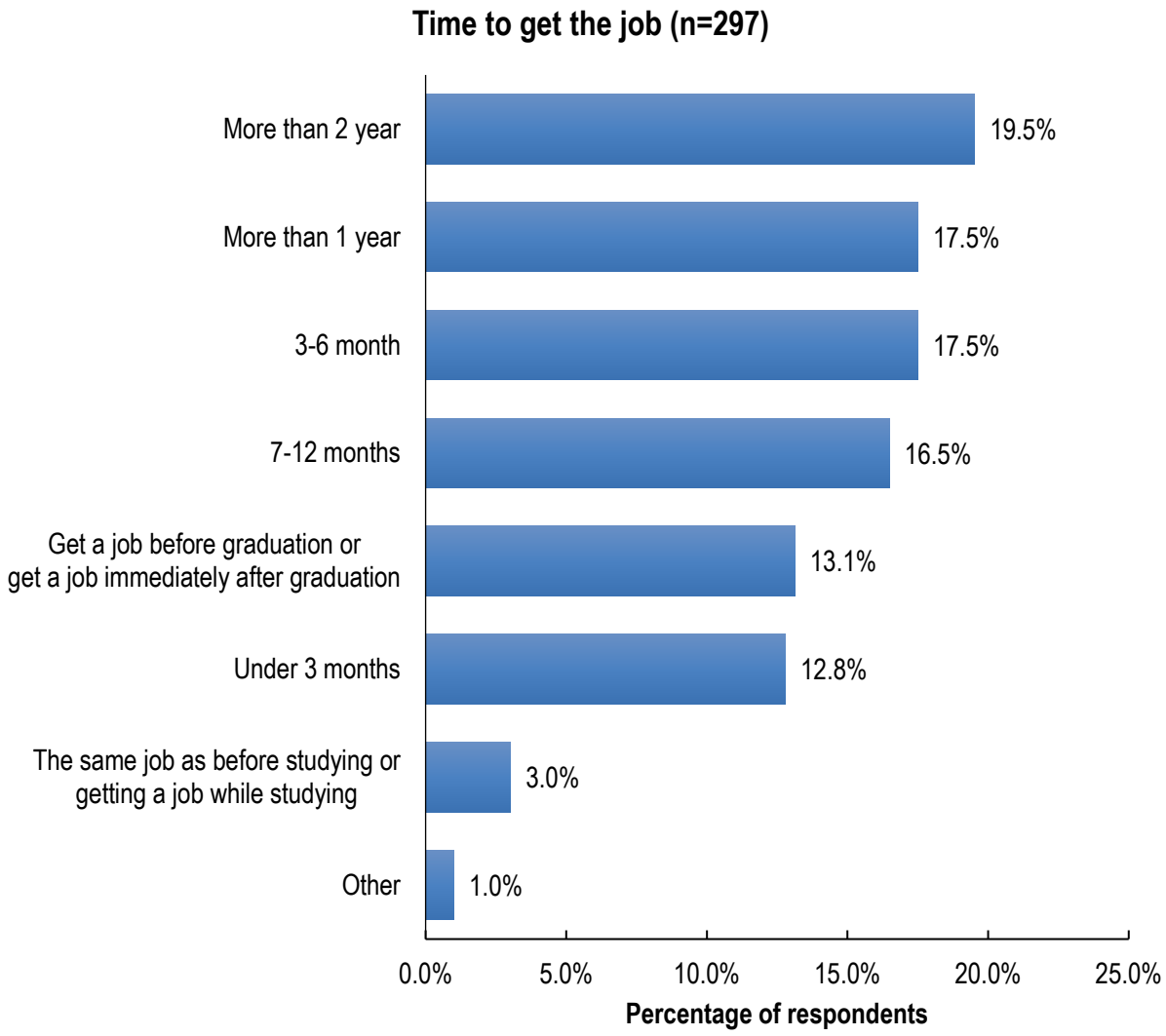


Figure 3.16 The distribution of the time taken for respondents of engineering graduates to obtain a job after graduation (n=297)

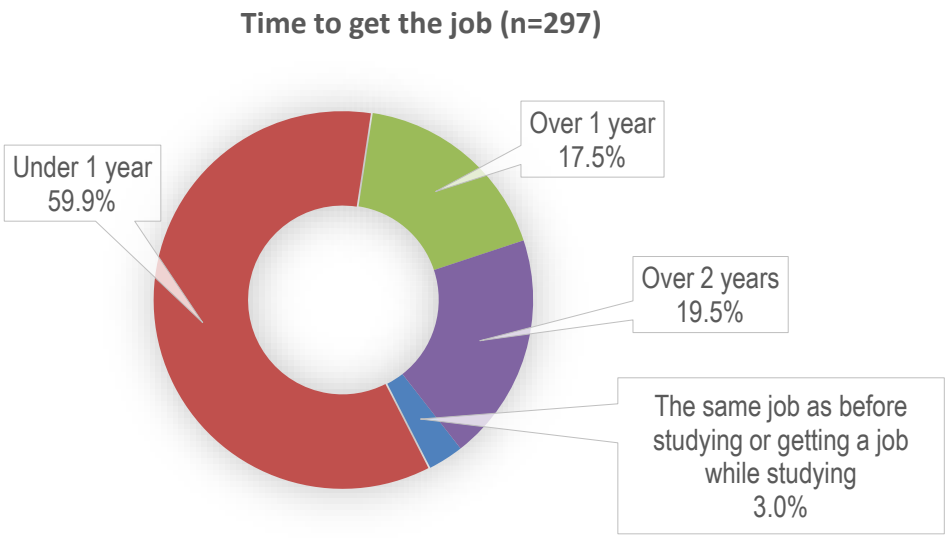


Figure 3.17 Overall distribution of the time taken for respondents of engineering graduates to obtain a job after graduation (n=297)

The Pie chart in Figure 3.17 provides a summarized overview by grouping the detailed time intervals from the earlier bar chart into simplified categories. The majority of respondents, **59.9%**, secured a job **within one year**, indicating a relatively strong transition rate from graduation to employment for most graduates. A smaller but notable proportion, 17.5%, reported needing more than one year to secure employment, while 19.5% required over two years. It indicates that more than one-third of respondents experienced a delayed transition into the labor market, while **3.0%** of the respondents continued in the same job they held prior to studying or obtained a job while still completing their studies.

Key finding:

- The majority of respondents (59.9%), secured a job within one year, indicating a relatively strong transition rate from graduation to employment for most graduates.
- A smaller but notable proportion, 17.5%, reported needing more than one year to secure employment
- 19.5% required over two years. It indicates that more than one-third of respondents experienced a delayed transition into the labor market
- 3.0% of the respondents continued in the same job they held prior to studying or obtained a job while still completing their studies.

3.5 Job type

The horizontal bar chart (Figure 3.18) presents variation of job secured by the employed engineering graduates with the total respondents of 295, broken down by their graduating universities, i.e., UNDIL, UNITAL, UNPAZ, DIT, and UNTL. The two dominant sectors that mostly employ graduates are the Government institutions and the private sector, as reflected in the statistical data. UNTL graduates are Highly employed in the Private sectors (23,4%) and Government institutions (42.1%). Furthermore, UNTL graduates are also employed by the Foreign/International organizations (15,0 %), and the state-own enterprise (15,9 %). DIT graduate's, majority are employed as Government officers (45.0%) and the balance between Foreign/international organizations (23.3%), and representation in the private sector (23.3%). Furthermore, Graduates from UNPAZ are mainly employed by the Private sector (40.5%) and Government officers (34.5%). While UNITAL graduates are distributed in State-owned enterprise (24.1%) and is balanced across Government officers (31.0%) and Private sectors (31.0 %). Lastly, graduates from UNDIL are also employed as Government officers (26.7%) and in the Private sectors (23.4%).

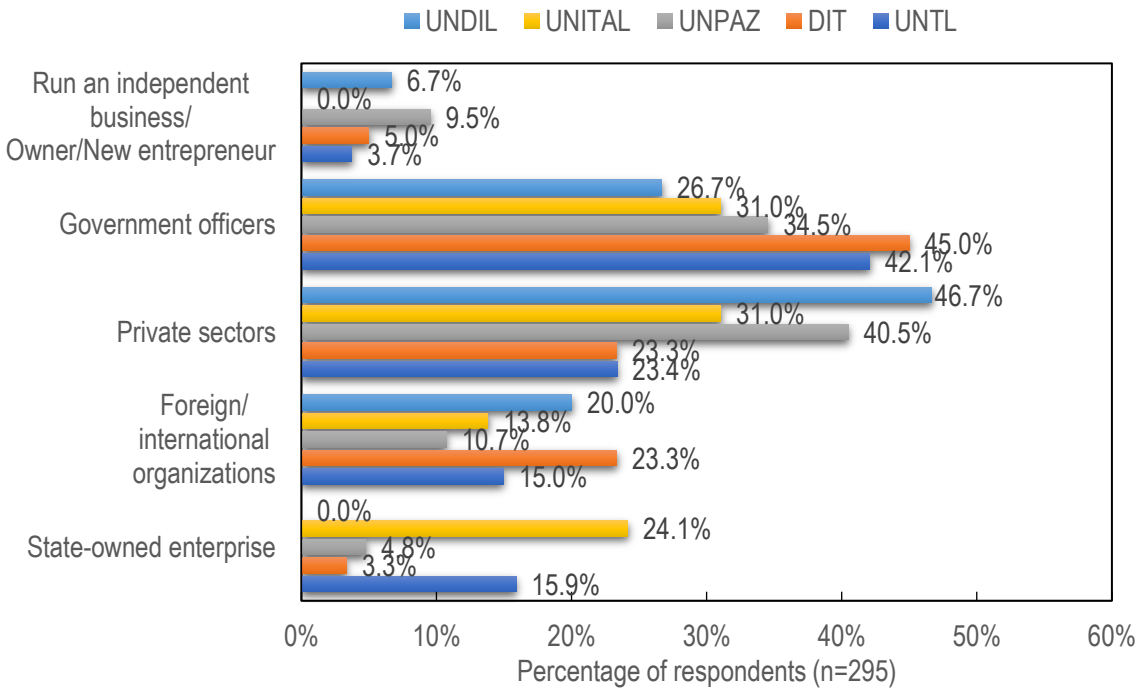


Figure 3.18 Variation of job secured by the employed engineering graduates (n=295)

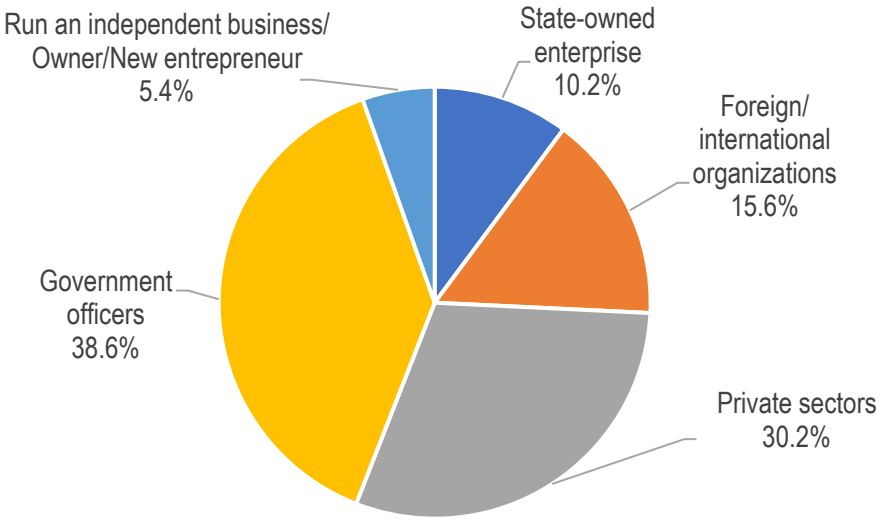


Figure 3.19 The overall distribution of job types among all employed engineering graduates (n = 295) across the five universities

In general, the pie chart in Figure 3.19 summarizes the data from the preceding bar chart, presenting the overall distribution of job types among all employed engineering graduates (n = 295) across the five universities. It illustrates the relative proportion of each employment sector within the combined graduate respondents. The public sector dominates as employer with 38,6%, suggests that public service is the crucial career paths for engineering graduates. Private sectors are the second largest employer at 30,2 %. In the third place of major employer is the foreign/International organizations 15,6 %, followed by the state-owned enterprise at 10,2 % and, Entrepreneurship and independent business 5,4%.

Key finding:

- The public sector dominates (38,6%), it suggests that public service is the crucial career paths for engineering graduates.
- Private sectors are the second largest employer at 30,2 %.
- Most of the graduates are expected to be employed as government officer, Foreign/internal Organization and private sectors because of the steady and relative high salary.

3.6 Match between work and field of study

The bar chart (Figure 3.20) breaks down the match between the work and field of studies of employed graduates into the three categories, but separates the results by the educational institution attended: **UNTL, DIT, UNPAZ, UNITAL,** and **UNDIL**. The data show that the majority of the 295 respondents (**67.8%**) are working in a field directly related to their studies. More than 60% of graduates from each university reported **high overall matching**, except UNDIL with only 40 % of working matching related to their study.

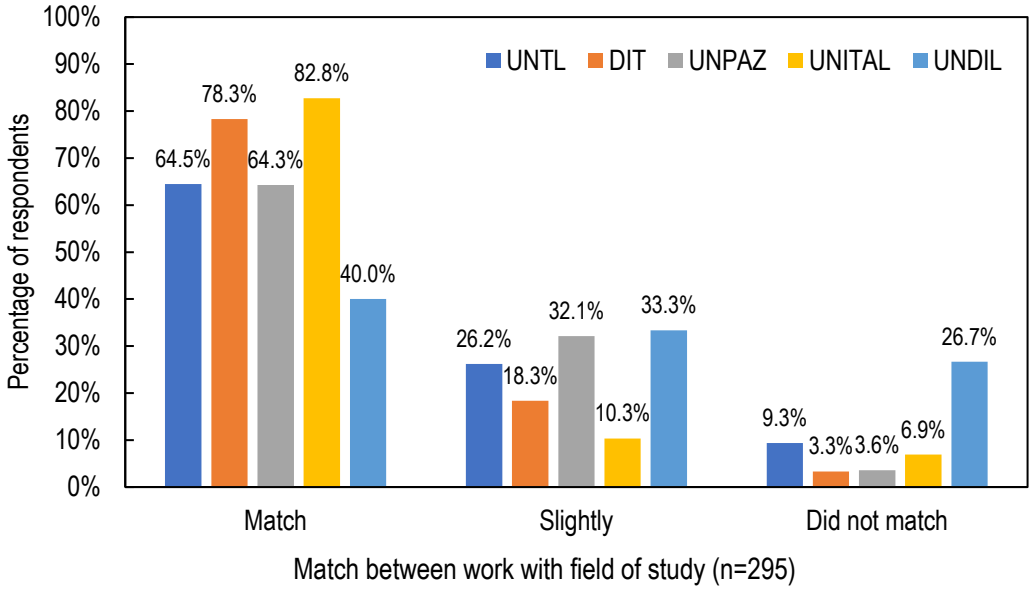


Figure 3.20 The match between the work and field of studies of employed graduates

UNITAL and **DIT** appear to have the highest rate of graduates finding work directly related to their field of study with 82,8 % and 78,3 % respectively. On the other side, UNDIL has the highest rate of graduates in jobs with a **Slightly Match** or **Did not Match** relationship to their field of study at 33,3 %. Furthermore, the percentage of graduates whose work **did not match** their field of study is generally low below 10% across the universities, with the exception of UNDIL with 26,7 %.

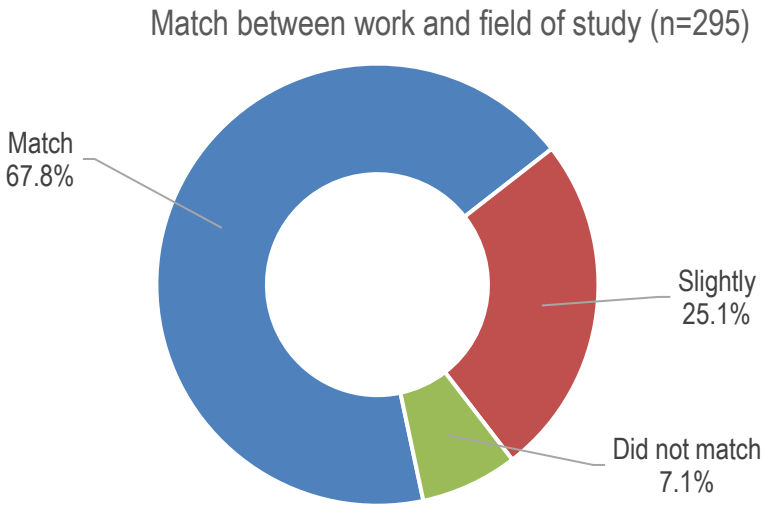


Figure 3.21 The overall distribution of how well respondents felt their current work aligns with their field of study

The pie chart in Figure 3.21 provides the overall distribution of how well respondents felt their current work aligns with their field of study. The majority of respondents, **67.8%**, reported a **direct match** between their work and their field of study. This indicates a high level of relevance between education and subsequent employment for most of the sample. **25.1%** of the respondents, indicated that their work **slightly matched** their field of study. This suggests some overlap or partial relevance. On the other hand, relatively small percentage, **7.1%**, reported that their work **did not match** their field of study, meaning their current occupation has little or no direct connection to their educational background.

Key finding:

- The majority (67.8%), reported a direct match between their work and their field of study. This indicates a high level of relevance between education and subsequent employment
- 25.1% of the respondents, indicated that their work slightly matched their field of study. This suggests some overlap or partial relevance.
- Relatively small percentage, 7.1%, reported that their work did not match their field of study, meaning their current occupation has little or no direct connection to their educational background.

3.7 The correlation between Time to get job and Job match area of study

The Table 3.5 presents the Pearson's correlation coefficient (r) between two variables: Time to get the job and Job match area of study. The correlation coefficient indicates the strength and direction of a linear relationship between the mentioned variables. The data show **Positive correlation (r > 0), where the** longer time to get a job tends to be associated with a better match to the graduates' field of study. UNPAZ and UNITAL have the strong correlation, where waiting longer to find a job has the highest payoff in terms of finding a highly relevant job. DIT and UNDIL have moderate to strong correlation, with clear and noticeable positive trade-off, waiting longer tends to result in a better job match. While UNTL with Moderate correlation, to show the weakest relationship. While the trend still exists, for UNTL graduates, the time spent searching does not correlate as strongly with job match quality compared to the other institutions.

The overall mean correlation (+0.663) indicates that, on average, the relationship between time to secure a job and job alignment with a graduate's field of study is moderate to strong. This confirms that the positive trade-off, where longer job search tends to result in better field alignment, is the dominant trend among graduates in this study. Moreover, the relatively low standard deviation (0.124) suggests that, although correlations range from 0.48 to 0.81, the strength of this relationship is fairly consistent across institutions, with all following the same general positive pattern.

Table 3.5 The overall distribution of job types among all employed engineering graduates (n = 295) across the five universities

Institution	**Correlation (*Pearson's correlation*) between:** Time to get the job ↔ Job match area of study		
UNTL	*r* = +0.48 (Moderate correlation)	Mean +0.663	STDEV 0.124
DIT	*r* = +0.63 (Moderate to strong correlation)		
UNPAZ	*r* = +0.81 (Strong correlation)		
UNITAL	*r* = +0.74 (Strong correlation)		
UNDIL	*r* = +0.66 (Moderate to strong correlation)		

3.8 Occupation of Graduates

The bar chart in Figure 3.22 breaks down the number of graduates in each occupational category across the five universities: UNTIL, DIT, UNPAZ, UNITAL, and UNDIL. The data show that for Professional category, graduates from UNTL dominate this category with **46** individuals, significantly higher than any other institution. UNPAZ follows with 33 graduates in professional roles, DIT is the third-highest producer of professionals. Furthermore, UNITAL has a moderate presence, while **UNDIL** has the lowest number of graduates (2) in this high-skilled category. In the second category, UNPAZ leads in placing graduates in **Supporting Staff** roles with 22 respondents. **UNTL (14)** and **UNITAL (13)** follow with almost similar numbers. **DIT (7)** and **UNDIL (5)** have the fewest graduates in this category. The third category, **Technicians and Associate Professionals, UNTL (24)** is the largest contributor to this field and **UNPAZ (15)** is the second-largest. The remaining institutions of DIT (5), UNITAL (3), and UNDIL (2) contribute only a small number of graduates to this occupational level. In the Managerial category, **DIT (15)** is the clear leader in placing graduates into **Managerial** positions, followed by **UNPAZ (11)** and **UNTL (9)** as the next largest contributors. **UNITAL (4)** and **UNDIL (1)** have a minimal number of graduates occupy in the managerial category. The last category of occupation is **Lecturer / teacher / trainer, where UNTL (13)** dominates the education sector roles. While **UNPAZ (3)** and **DIT (1)** contribute very few graduates to this category.

The pie chart in Figure 3.23illustrates the overall distribution of graduates across five major occupational categories: The largest share of graduates is employed in **Professional** roles, accounting for nearly **43%** of the sample. This category typically includes high-skill occupations or specialists in various engineering fields. The second-largest group is employed as **Supporting Staff** (administrative, office support, etc.), making up over one-fifth of the total. The third group is **Technicians and Associate Professionals (16.7%)**: This category, which includes roles requiring technical knowledge. The next category is in **Managerial** positions make up approximately 13.6% of the sample. The last and the smallest category is for education roles as **Lecturer/teacher/trainer**, accounting for only **6.5%** of the employed graduates.

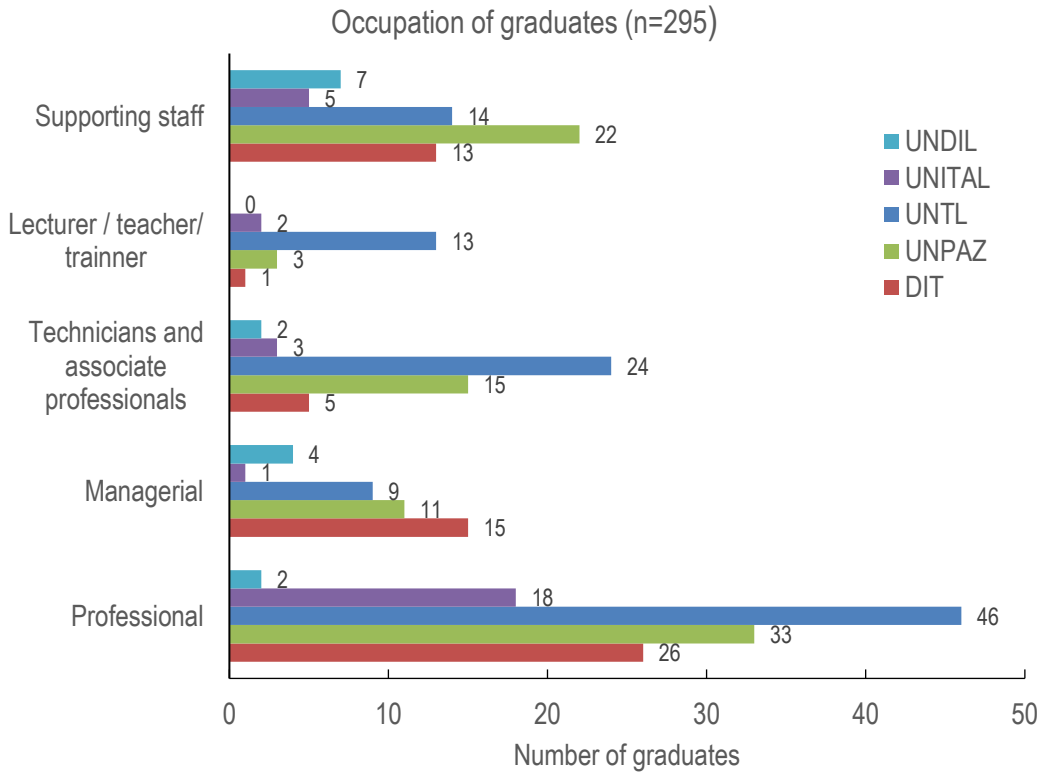


Figure 3.22 The overall distribution of how well respondents felt their current work aligns with their field of study

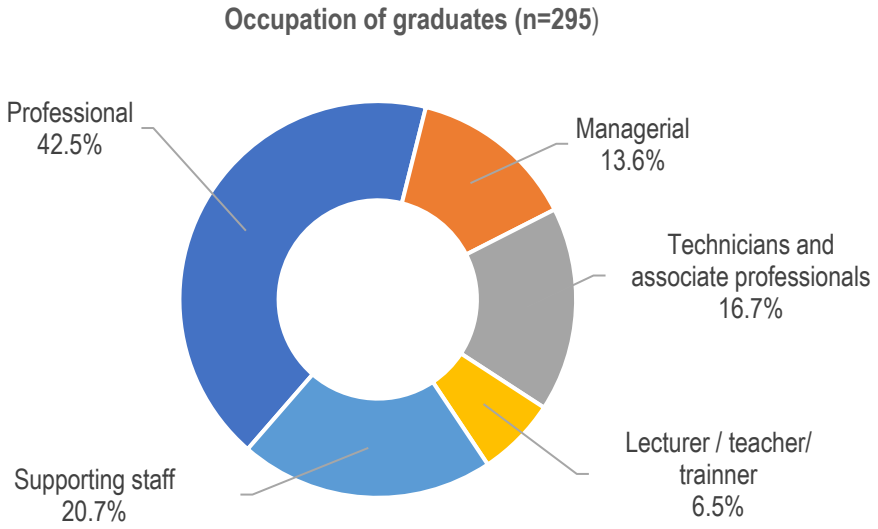


Figure 3.23 The overall distribution of how well respondents felt their current work aligns with their field of study

Key finding:

- The largest share of graduates is employed in Professional roles, accounting for nearly 43% of the sample. This category typically includes high-skill occupations or specialists in various engineering fields
- Over one-fifth of the total, employed as Supporting Staff (administrative, office support, etc.)
- Technicians and Associate Professionals (16.7%) for roles requiring technical knowledge.
- The rest are employed as managerial and others are contributing to the education role.

3.9 Job match, Job satisfaction and Applied knowledge

The pie chart in Figure 3.24 shows the degree to which graduates feel their current job aligns with their field of study, based on a sample of N=295 respondents. It shows that the vast majority, over two-thirds of the graduates (**67.8%**), report a **direct match** between their job and their field of study. This is a very positive indicator of the relevance of their education to the job market. 25 % of the respondents feel their job **slightly matches** their field of study, suggesting partial use of their educational background. While the small minority **7.1%** report that their job **did not match** their field of study, indicating a low overall rate of complete misalignment.

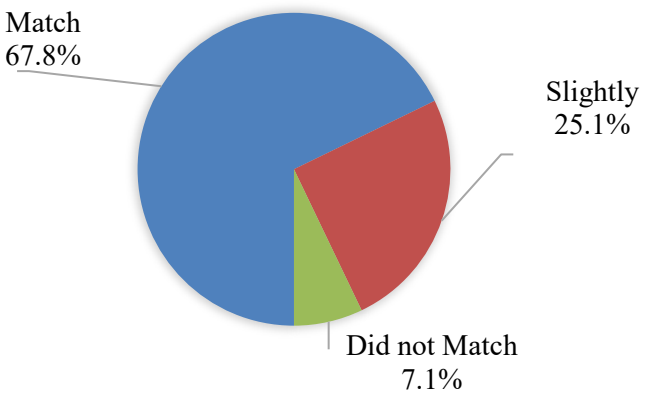


Figure 3.24 The degree to which graduates feel their current job aligns with their field of study (n=295)

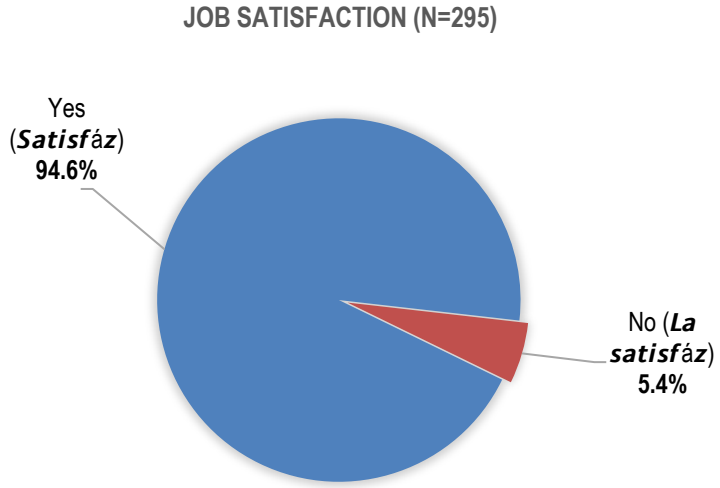


Figure 3.25 The overall job satisfaction among the graduates (N=295)

The pie chart in Figure 3.25 presents the overall job satisfaction among the graduates (N=295). It shows that majority of the graduates, **94.6%**, report being **satisfied** with their current job, while the remaining a very small percentage, **5.4%**, report being dissatisfied.

The bar chart (Figure *3.26*) illustrates the level of applied knowledge from their studies used in their current job, broken down by institution. The categories range from "Most" (Barak liu) to "None" (Laiha liu). The majority of graduates from **UNTL, UNPAZ, and DIT** report using **"Most"** or **"More"** of the knowledge gained from their studies. This indicates that their curricula are generally well-aligned with the practical demands of their employment, particularly for UNTL.

For the category of **"Most" (Barak liu)**, **UNTL (45)** has the highest number of graduates who apply **most** of their knowledge, indicating their education is highly utilized in the workforce. **UNPAZ (26)** and **DIT (15)** follow, showing significant application of knowledge. **UNITAL (15)** is also adequately represented, while **UNDIL (1)** has the lowest number.

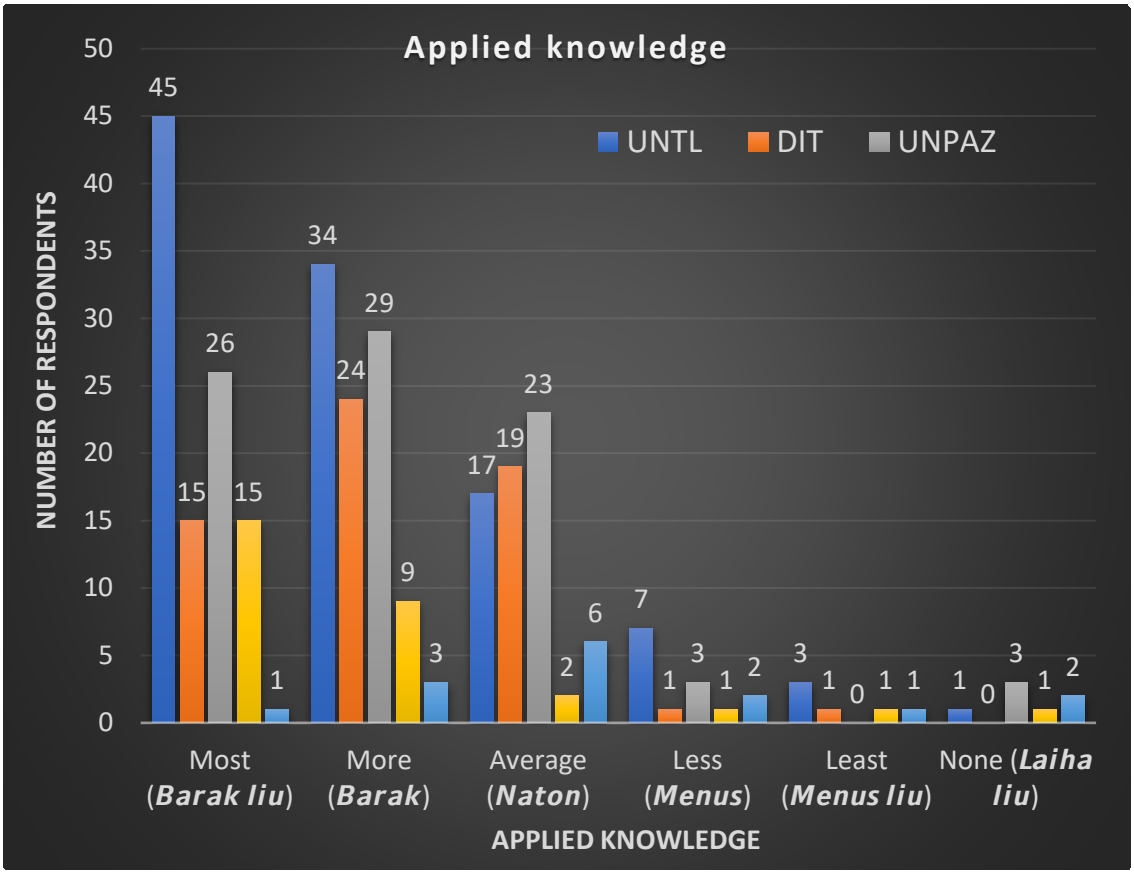


Figure 3.26 The level of applied knowledge from their studies used in their current job, broken down by institution.

For the category of **"More" (Barak)**, **UNPAZ (29)** has the highest number in this category, followed by **UNTL (34)**. This suggests a large proportion of graduates from these institutions use a substantial amount of their learned knowledge. The next category is **"Average" (Naton)**, **UNPAZ (23)** and **DIT (19)** have the highest number of graduates who report an **average** level of applied knowledge. The last category is **Low/Least/None**, **UNDIL** graduates are predominantly in the **"Average" (3), "Less" (3),** or **"Least" (1)** categories, suggesting a general lower usage of specialized knowledge from their studies compared to other institutions. Only a few respondents across all institutions report using **"Least"** or **"None"** of their applied knowledge, with the exception of UNTL and DIT who have the highest numbers in the "None" category (3 and 1 respectively), likely due to their larger overall sample sizes.

3.10 Correlation between Job match, Job satisfaction and Applied knowledge

In this study, the correlation analysis between Job match, Job satisfaction and Applied knowledge was done in order to know whether there is the relationship between two variables or not. Here we examines the statistical significance of the linear relationships among three key variables: Job Match, Job Satisfaction, and Applied Knowledge, based on a sample of N=510 graduates. The analysis uses a **Confidence Level (α) of 0.05** for a two-tailed hypothesis test regarding the population correlation coefficient (ρ).

Defined Hypotheses for Each Relationship

For each of the three pairings, a null hypothesis (H0) and an alternative hypothesis (H1) were defined in the following Table 3.6 .

Table 3.6 Hypothesis for relationship of Job Match, Job satisfaction and Applied knowledge

• Job Match ↔ Job satisfaction	
H0	No linear relationship between job match and job satisfaction
H1	There is a linear relationship between job match and job satisfaction
• Job Match ↔ Applied Knowledge	
H0	No linear relationship between job match and applied knowledge
H1	There is a linear relationship between job match and applied knowledge
• Job Satisfaction ↔ Applied Knowledge	
H0	No linear relationship between job satisfaction and applied knowledge
H1	There is a linear relationship between job satisfaction and applied knowledge

The table 3.7 presents the Pearson's correlation coefficients (r) for graduates of UNTL, showing the linear relationships between Job Match, Job Satisfaction, and Applied Knowledge.

Table 3.7 The correlation between Job Match, Job satisfaction, and Applied knowledge of UNTL respondents

(a) UNTL

	Job Match	Job satisfaction	Applied knowledge
Job Match	1	0.706	0.873
Job satisfaction	0.706	1	0.813
Applied Knowledge	0.873	0.813	1

The calculated result shows that all correlation coefficients are positive and fall between +0.706 and +0.873, indicating strong positive relationships between every pair of variables. Graduates whose jobs align with their field of study tend to apply more of the knowledge gained during their studies, and this application of knowledge is strongly associated with higher job satisfaction.

1. **Job Match ↔ Applied Knowledge (r = 0.873)**

This is the strongest correlation in the matrix. Graduates whose jobs closely match their area of study are highly likely to report that they use a high level of applied knowledge in their work. This suggests a very strong alignment between academic preparation and actual job tasks.

2. **Job Satisfaction ↔ Applied Knowledge (r = 0.813)**

This is also a strong positive correlation. The more graduates feel they are using their knowledge on the job, the higher their job satisfaction tends to be. Applied knowledge appears to be an important driver of satisfaction.

3. **Job Match ↔ Job Satisfaction (r = 0.706)**

This is a moderate to strong correlation. When graduates work in positions that match their field of study, they tend to be more satisfied with their jobs. The relationship is strong, but not as strong as the connection involving applied knowledge.

Table 3.8 The correlation between Job Match, Job satisfaction, and Applied knowledge of DIT respondents

(b) DIT

	Job Match	Job satisfaction	Applied knowledge
Job Match	1	0.838	0.905
Job satisfaction	0.838	1	0.868
Applied Knowledge	0.905	0.868	1

The correlations for DIT graduates are even stronger than those observed for UNTL, suggesting an extremely tight relationship among these three factors:

1. Job Match has a very strong influence on Applied Knowledge (r = +0.905).
2. Applied Knowledge strongly drives Job Satisfaction (r = +0.868).
3. The overall Job Match is an excellent predictor of Job Satisfaction (r = +0.838).

These results suggest that DIT's success in ensuring graduates find relevant jobs (as noted in the earlier bar chart where DIT had a high Match percentage) is directly linked to high knowledge application and, consequently, very high job satisfaction.

Table 3.9 The correlation between Job Match, Job satisfaction, and Applied knowledge of UNPAZ respondents

(c) UNPAZ

	Job Match	Job satisfaction	Applied knowledge
Job Match	1	0.913	0.970
Job satisfaction	0.913	1	0.874
Applied Knowledge	0.970	0.932	1

The data for UNPAZ shows an extremely strong coherence among job relevance, knowledge application, and satisfaction. The relationships are much stronger than those seen for UNTL and DIT.

The findings highlight that for UNPAZ graduates:

1. Job relevance (Match) is almost perfectly coupled with knowledge utilization (r = +0.970).
2. High knowledge utilization and high job match are both exceptionally strong drivers of Job Satisfaction (r > +0.91).

This pattern suggests that UNPAZ graduates highly value working within their field and utilizing their education, making these factors paramount to their overall job satisfaction.

Table 3.10 The correlation between Job Match, Job satisfaction, and Applied knowledge of UNITAL respondents

(d) UNITAL

	Job Match	Job satisfaction	Applied knowledge
Job Match	1	0.857	0.964
Job satisfaction	0.857	1	0.884
Applied Knowledge	0.964	0.884	1

The data for UNITAL reveals an incredibly high degree of interdependence between the three variables. All correlation coefficients are extremely high, ranging from +0.857 to +0.964. This signifies very strong to near-perfect positive relationships among all three variables, comparable in strength to UNPAZ and DIT, but with the Job Match ↔ Applied Knowledge link being almost perfect (r = +0.964). This suggests that UNITAL

graduates place a very high value on the relevance and utilization of their specific academic background.

The overall high job satisfaction is strongly driven by their success in finding jobs that allow them to use their education effectively, which, as previously observed at the highest rate (82.8% Match).

Table 3.11 The correlation between Job Match, Job satisfaction, and Applied knowledge of UNDIL respondents

(e) UNDIL

	Job Match	Job satisfaction	Applied knowledge
Job Match	1	0.729	0.683
Job satisfaction	0.729	1	0.822
Applied Knowledge	0.683	0.822	1

The correlations for UNDIL reveal a slightly different dynamic compared to the other universities, especially concerning the role of Job Match:

1. Job Match is Less Critical to Knowledge Use: The weak link between Job Match and Applied Knowledge (r = +0.683) means that job titles/fields are less indicative of whether the graduate's education is actually being used.
2. Applied Knowledge is Still Key to Satisfaction: Despite the weak match-knowledge link, the strong correlation between Applied Knowledge and Job Satisfaction (r = +0.822) confirms that, ultimately, using their education is what makes UNDIL graduates satisfy in their jobs, regardless of the official "match" status.

This suggests that UNDIL graduates may need to be more resourceful in applying their knowledge even in the less-matched roles to achieve high satisfaction.

*Table 3.12 Average of Pearson's coefficient of 5 universities, the average of t-value and p-value with alpha (**α**) = 0.05 (n=510)*

Variable	r	t-value	p-value
Job Match vs Job satisfaction	0.809	30.91	1.3E-118
Job Match vs Applied Knowledge	0.879	41.48	6.08E-165
Job satisfaction vs Applied knowledge	0.852	36.63	2.01E-144

The table 3.12 above summarizes the average Pearson's correlation coefficients (r) and the associated statistical tests (t-value and p-value) for three key relationships, averaged across the five universities, based on a large sample size (N=510) and a significance level (α) of 0.05.

The results demonstrate a series of **highly significant and strong positive relationships** among all three variables.

1. **Job Match ↔ Job Satisfaction (r = 0.809),** showing Strong positive correlation. Graduates in jobs closely aligned with their field of study generally report higher job satisfaction.
2. **Job Match ↔ Applied Knowledge (r = 0.879)**, showing Very strong positive correlation. Jobs aligned with graduates' field of study are strongly associated with the use of applied knowledge.
3. **Job Satisfaction ↔ Applied Knowledge (r = 0.852)**, showing Very strong positive correlation. Greater use of applied knowledge is strongly linked to higher job satisfaction.

In terms of Statistical Significance, **t-values** are very high, and **p-values** are extremely low ($p \ll 0.05$) for all variable pairs. This indicates that all correlations are **highly statistically significant**, confirming that the observed relationships are **not due to chance**.

It can be concluded that, across the five universities, there is a consistent and strong positive relationship among Job Match, Job Satisfaction, and Applied Knowledge. Graduates whose jobs closely match their field of study are more likely to use their applied knowledge, which in turn is strongly associated with higher job satisfaction. The extremely low p-values indicate that these relationships are highly statistically significant ($\alpha = 0.05$).

3.11 Geographical location of respondents

The Table 3.12 provide details of the geographical location of the survey respondents, distinguishing between the total sample (N=509) and the subset of working graduates (N=302).

The data can be divided into three categories; Dili **dominates the sample:** More than half of all respondents are from Dili (59.3%), and it also has the highest proportion of workers (60.3%). It suggests a concentration of both graduates and employed respondents in the capital, likely reflecting urban employment opportunities. **Rural and other municipalities:** Respondents from Ermera, Lospalos, Maliana, Same, Ainaro, Suai, Liquica, Baucau, Oecusse, Viqueque, Aileu, Manatuto, and Atauro together account for less than 40% of the total sample. Worker representation in these areas ranges from 0% (Atauro) to 5.3% (Ermera). **Foreign respondents:** Only 1% of the total sample is from foreign countries, but they make up 2% of workers, suggesting some graduates work abroad.

Overall distribution: The data highlights a strong **urban concentration of respondents and workers in Dili**, with much smaller representation from other municipalities. The worker percentages are roughly proportional to the total respondents in most locations, indicating no extreme bias except in small-sample locations like Atauro (0 workers).

Table 3. 13 The details of the geographical location of the survey respondents, distinguishing between the total sample (N=509) and the subset of working graduates (N=302).

Location	Total respondents		Worker respondent	
Dili	302	59.3%	182	60.3%
Ermera	22	4.3%	16	5.3%
Lospalos	18	3.5%	12	4.0%
Maliana	13	2.6%	12	4.0%
Same	22	4.3%	11	3.6%
Ainaro	15	2.9%	11	3.6%
Suai	23	4.5%	11	3.6%
Liquica	13	2.6%	10	3.3%
Baucau	33	6.5%	9	3.0%
Oecuse	14	2.8%	8	2.6%
Viqueque	16	3.1%	7	2.3%
Foreign country	5	1.0%	6	2.0%
Aileu	4	0.8%	4	1.3%
Manatuto	7	1.4%	3	1.0%
Atauro	2	0.4%	0	0.0%
Total	**509**	**100%**	**302**	**100%**

Key finding:

- Dili dominates the sample: More than half of all respondents are from Dili (59.3%), and it also has the highest proportion of workers (60.3%). It suggests a concentration of both graduates and employed respondents in the capital, likely reflecting urban employment opportunities.
- Less than 40% of the total sample distributed among Rural and other municipalities.

- The worker percentages are roughly proportional to the total respondents in most locations, indicating no extreme bias except in small-sample locations like Atauro (0 workers).
- Foreign respondents: Only 1% of the total sample is from foreign countries, but they make up 2% of workers, suggesting some graduates work abroad.

3.12 Overview of Salary Distribution

The bar chart of Figure 3.27 presents the salaries distribution of the surveyed university graduates that are heavily concentrated at the **low-to-middle end** of the income scale.

1. **Dominant Salary Range**; **$101 – $500 (76.2%)**: By far, the majority of working graduates (76.2%) fall within this modest salary range. This suggests that three-quarters of the graduates are earning between US$101 and US$500 per month.

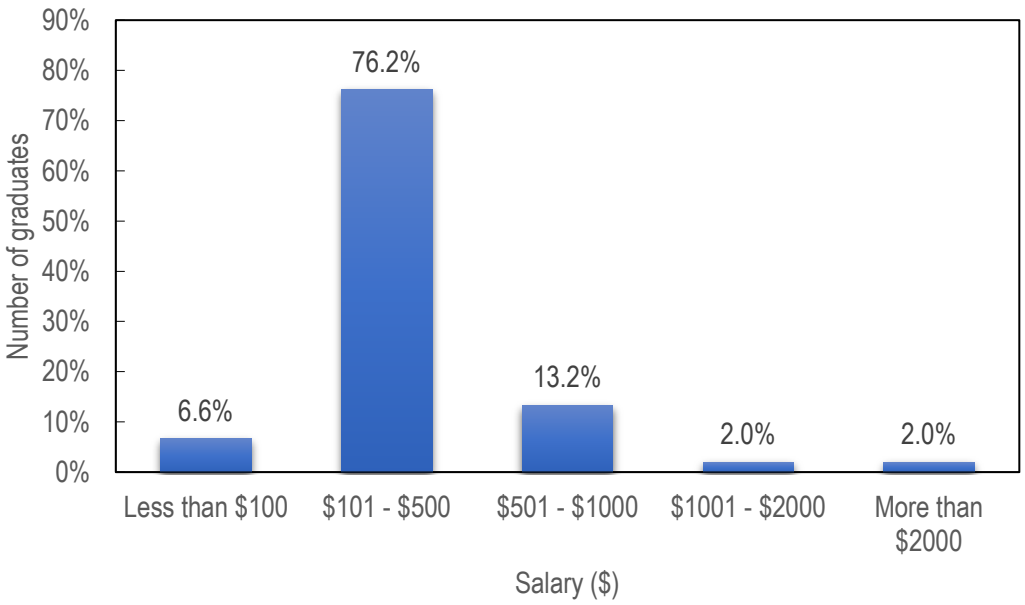


Figure 3.27 The salaries distribution of the surveyed university graduates

This high concentration points to the overall economic structure of the job market for university-educated individuals, likely encompassing roles in both the public and private

sectors, including many of the Supporting Staff and Technicians identified in previous charts.

2. Low-Income Bracket; Less than $100 (6.6%): A small but significant portion (**6.6%**) of graduates earn less than US$100 per month. These graduates are likely in very low-paying entry-level positions, casual/part-time work, or low-income positions in the public sector or non-profit organizations.

3. Middle-Income Bracket; $501 – $1000 (13.2%): Only **13.2%** of graduates fall into this middle-income range. These salaries are typically indicative of more experienced professionals, specialized technicians, or entry-to-mid-level managerial roles. This group is likely composed of the more successful graduates from the Professional and Managerial categories identified earlier.

4. High-Income Bracket; **$1001 – $2000 (2.0%)** and **More than $2000 (2.0%)**: Only a very small fraction of the graduates (**4.0% combined**) earns salaries exceeding US$1000 per month. These high salaries are characteristic of senior managers, top-tier professionals, or those working for international organizations (NGOs, UN agencies) or specific high-value private sectors.

3.13 Relationship between salary and mobility of working graduates

The table 3.14 breaks down the **Monthly Salary Distribution** by the graduate's working location: **Non-mobile (Working in Dili)** versus **Mobile (Working outside Dili)**, based on a total of 302 working graduates. Overall, 60.3**%** (182 graduates) are non-mobile of the working population is based in Dili, while 39.7**%** (120 graduates) are mobile workers, working outside the capital.

1. **Majority earn low to moderate salaries:** The largest salary bracket for both non-mobile and mobile graduates is **$101–$500**, representing **43.7% of non-mobile** and **32.5% of mobile** graduates.

2. **High-income earners are rare:** Very few graduates earn more than $1000: Non-mobile: 7 individuals (3.8%), and Mobile: 5 individuals (4.2%)
3. **Non-mobile vs mobile comparison:** Non-mobile graduates (working in Dili) slightly dominate across most salary categories, particularly the $101–$500 range. Mobile graduates have a slightly higher presence in the $1001–$2000 category relative to their total (1.3% vs 0.7%), but absolute numbers remain very small.
4. **Low-income prevalence:** Combined, the majority of graduates earn less than $500 per month, highlighting potential **income limitations for early-career graduates**, whether they remain in Dili or move outside.

In conclusion, working in Dili presents both the greatest risk of very low pay and the potential for the highest earnings. In contrast, working outside Dili offers a more compressed and stable salary profile, with a slightly higher likelihood of earning in the $1,001–$2,000 range, but almost no chance of earning less than $100.

Table 3.14 Monthly Salary Distribution by the graduate's working location: Non-mobile versus Mobile (n=302)

Salary ($)	Non mobile (Working in Dili)		Mobile graduate (Working outside Dili)	
Less than $100	18	6.0%	2	0.7%
$101 - $500	132	43.7%	98	32.5%
$501 - $1000	25	8.3%	15	5.0%
$1001 - $2000	2	0.7%	4	1.3%
More than $2000	5	1.7%	1	0.3%
Total	**182**	**60.3%**	**120**	**39.7%**

3.14. Correlation analysis between salary and mobility of working graduates

In this study, the relationship between salary and mobility of working graduates were analyzed. The analysis was done to the mobile graduate and non-mobile graduate. The provided data in Table 3.15 shows the Pearson's correlation coefficient (r) between the **Salary** of working graduates and their **Mobility Status** (Non-mobile/Dili vs. Mobile/Outside Dili). Both correlations are **negative**, indicating an inverse relationship.

Table 3.15 Pearson's correlation coefficient (r) between the Salary of working graduates and their Mobility Status

(a) Non mobile graduate

	Salary ($)	*Non mobile graduate*
Salary ($)	1	-0.455
Non mobile graduate	- 0.455	1

(b) Mobile graduate

	Salary ($)	*Mobile graduate*
Salary ($)	1	-0.364
Mobile graduate	- 0.364	1

1. Interpretation of the Negative Correlation: In this context, a negative correlation suggests that as the score on the location variable increases (i.e., belonging to the Dili group for r = −0.455 or the Mobile group for r = −0.364), the reported salary tends to be lower. This seemingly counterintuitive result (since Dili has the highest salaries) is best explained by the **overwhelming concentration of low-to-middle-income earners in Dili** as previously observed: **72.5%** of Dili workers earn between $101–$500. **9.9%** of Dili workers earn less than $100.

While Dili contains the few highest earners (>$2000), this small number is statistically offset by the large percentage of workers clustered at the lower end, resulting in an overall **moderate negative association** between the Dili location and higher salary values for the group as a whole.

2. Comparison of Mobility Status; The magnitude of the negative correlation is **stronger** for **non-mobile graduates** ($r = -0.455$) than for Mobile graduates ($r = -0.364$). **Dili Status is a Stronger Predictor:** The status of **working in Dili** is a stronger statistical predictor of the salary outcome (specifically, of being pulled toward the dominant low-to-middle range) than the status of working outside Dili. **Implication of Mobility:** Graduates who left Dili for work show a weaker negative association with salary. This means that while the overall economy dictates that the majority of mobile workers also earn low-to-middle wages (81.7% earn ≤$500), working outside Dili is less indicative of a low salary compared to working within the capital. This aligns with the previous finding that mobile graduates were three times more likely to be in the $1001–$2000 bracket, making their salary distribution slightly less concentrated at the extreme low end.

Key finding:

- Working in Dili presents both the greatest risk of very low pay and the potential for the highest earnings.
- In contrast, working outside Dili offers a more compressed and stable salary profile, with a slightly higher likelihood of earning in the $1,001–$2,000 range, but almost no chance of earning less than $100.
- Both correlations between salary earning, non-mobile and mobile worker are negative, indicating an inverse relationship.
- While Dili contains the few highest earners (>$2000), this small number is statistically offset by the large percentage of workers clustered at the lower end, resulting in an overall moderate negative association between the Dili location and higher salary values for the group as a whole.

3.15 Causes of job dissatisfaction

The chart in Figure 3.28 displays the **Reasons for job dissatisfaction** among graduates, broken down by the **university** they attended. The data is presented in a **bar chart** and a corresponding **table** showing the percentage of respondents from each university group who cited a specific reason

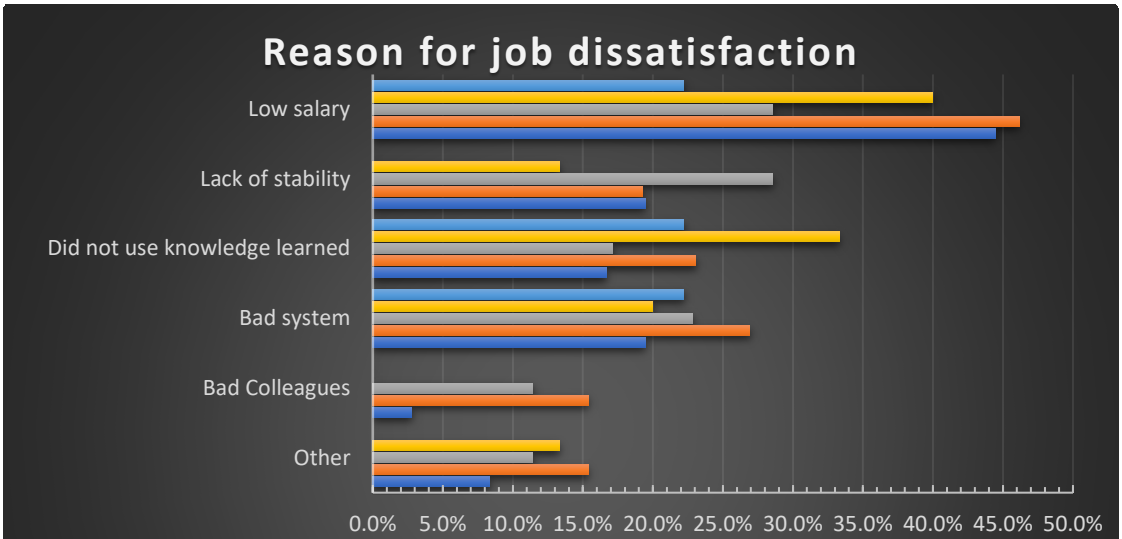
The most prominent reasons for job dissatisfaction are consistently:

1. **Low salary:** This is the most significant factor across all universities, with percentages ranging from **28.6%** (UNPAZ) to **46.2%** (DIT), and appearing as the longest bar in the chart for every university group.
2. **Lack of stability:** This is the second or third most common reason for most groups, particularly affecting graduates from **UNPAZ** (28.6%), **UNTL** (19.4%), and **DIT** (19.2%).
3. **Did not use knowledge learned:** This is a major concern, particularly for graduates from **UNITAL** (33.3%) and **DIT** (23.1%).

It is observed that **DIT** graduates report the highest dissatisfaction due to **Low salary (46.2%)**. **UNITAL** graduates show a disproportionately high concern about **Did not use knowledge learned (33.3%)** compared to other groups. **UNPAZ** graduates are unique in that **Lack of stability (28.6%)** ties with **Low salary (28.6%)** as their primary job dissatisfaction reason. Concerns about **Bad Colleagues** are relatively low across the board, never exceeding **15.4%** (DIT).

Key finding:

- Low salary: Is the most significant factor across all universities as a main reason for job dissatisfaction
- Lack of stability: This is the second or third most common reason for most groups, particularly affecting graduates from UNPAZ (28.6%), UNTL (19.4%), and DIT (19.2%).
- Did not use knowledge learned: This is a major concern, particularly for graduates from UNITAL (33.3%) and DIT (23.1%).



	Other	Bad Colleagues	Bad system	Did not use knowledge learned	Lack of stability	Low salary
UNDIL (n=9)	0.0%	0.0%	22.2%	22.2%	0.0%	22.2%
UNITAL (n=15)	13.3%	0.0%	20.0%	33.3%	13.3%	40.0%
UNPAZ (n=35)	11.4%	11.4%	22.9%	17.1%	28.6%	28.6%
DIT (n=26)	15.4%	15.4%	26.9%	23.1%	19.2%	46.2%
UNTL (n=36)	8.3%	2.8%	19.4%	16.7%	19.4%	44.4%

Figure 3.28 The reasons for job dissatisfaction among graduates for each university they attended.

3.16. Major reasons why unemployed respondents did not get a job after graduation

The reasons given by individuals for not being able to secure employment, based on n=179 respondents, is illustrated in Figure 3.29. The three most frequently cited reasons account for over 90% of the total responses and highlight issues related to the **hiring process, job availability, and personal motivation**:

1. **Waiting for an answer from agency (38.0%):** This is the single largest reason, suggesting that a significant portion of the difficulty lies in the **slow or unresponsive nature of the recruitment process** itself, particularly when dealing with employment agencies.

2. **Cannot find a job (26.8%):** This indicates a fundamental issue of **job scarcity** or a **mismatch** between the available jobs and the applicant's qualifications or expectations.
3. **Did not interested in working (25.7%):** This surprisingly high percentage suggests that a substantial number of respondents are facing motivational or psychological barriers to seeking or accepting employment, perhaps due to discouragement, burnout, or a focus on non-employment activities.

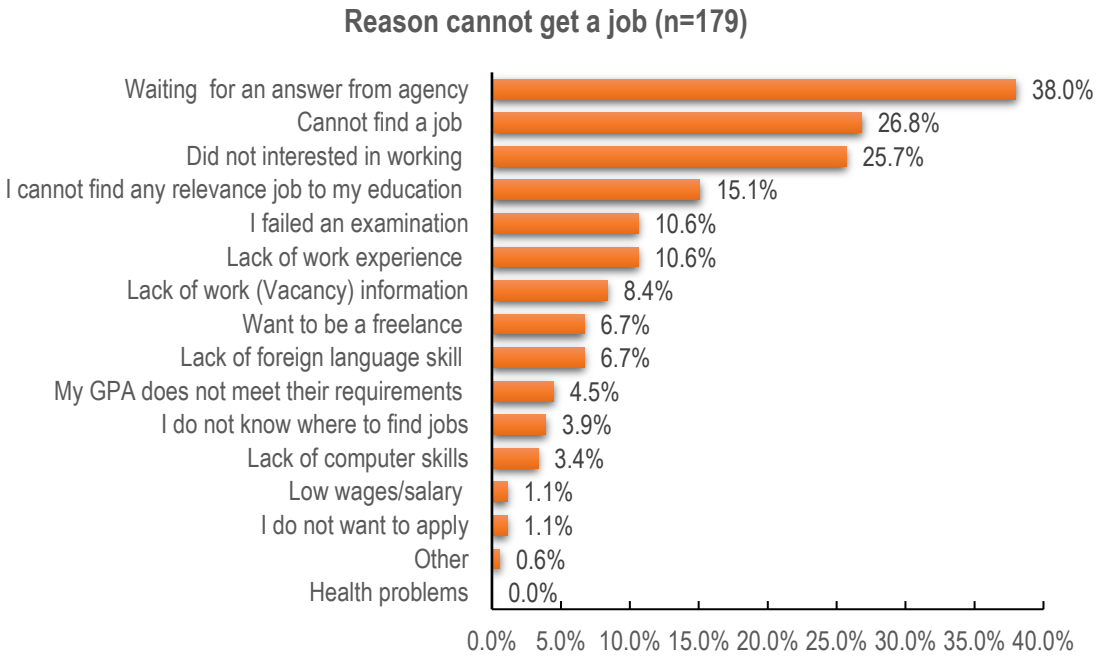


Figure 3.29 The reasons given by individuals for not being able to secure employment

Another reasons for not getting a job relate more directly to the applicant's qualifications and the perceived job relevance: I cannot find any relevance to my education (15.1%): This points to a perceived mismatch between education/skills and job requirements, or a difficulty in finding jobs that utilize the respondent's specific background. I failed an examination (10.6%): This refers to failing specific entrance exams, qualification tests, or professional certifications required for certain jobs, indicating a skills or knowledge gap. Lack of work experience (10.6%): This is a classic barrier for new entrants.

*Table 3.16 Distribution frequency of graduate who **did not interested in working** (n=46)*

	UNTL	DIT	UNPAZ	UNITAL	UNDIL
Respondent	1	0	43	0	2
Total	**46**				

The data provided in the table 3.16 is an unformatted frequency distribution showing which university's graduates were responsible for the n = 46 total responses citing **"Did not interested in working"** as the reason for not being able to get a job. The vast majority of the respondents who cited **"Did not interested in working"** (93.5%) came from **UNPAZ** graduates. Out of the 46 respondents who gave this reason, **43** were from **UNPAZ**. This suggests that this motivational/attitudinal barrier to employment is an almost exclusive phenomenon within the **UNPAZ** group among the universities surveyed for this specific reason. Graduates from DIT and UNITAL did not cite this reason at all.

Key finding:

- The three most frequently cited reasons account for over 90% of the total responses and highlight issues related to the hiring process, job availability, and personal motivation.
- Waiting for an answer from agency (38.0%): is the single largest reason, suggesting that a significant portion of the difficulty lies in the slow or unresponsive nature of the recruitment process itself, particularly when dealing with employment agencies.
- Cannot find a job (26.8%): This indicates a fundamental issue of job scarcity or a mismatch between the available jobs and the applicant's qualifications or expectations.

- Did not interested in working (25.7%): This high percentage suggests that a substantial number of respondents are facing motivational or psychological barriers to seeking or accepting employment, perhaps due to discouragement, burnout, or a focus on non-employment activities.

3.17 Interest in working aboard

The data in Table 3.17 shows the level of interest among graduates from five universities in **working in another country** (n = 487). Overall, **47.8%** (233 out of 487) of respondents are interested in working abroad. However, the interest varies significantly among universities. It shows that; Graduates from **DIT** show the strongest desire to work abroad, with **67.5%** of their respondents answering 'Yes'. **UNDIL** (64.9%) and **UNITAL** (60.0%) also show a high majority interested in working internationally. **UNPAZ** graduates are the least interested group, with only **33.3%** planning to work abroad. A strong majority (**66.7%**) of UNPAZ respondents prefer to stay. Interest among **UNTL** graduates is almost evenly split, with 50.4% saying 'Yes' and 49.6% saying 'No'.

Table 3.17 Respondents who are Interested in working abroad (n=487)

Question	Response	UNTL	DIT	UNPAZ	UNITAL	UNDIL
Are you thinking of going to work in another country?	**Yes**	61	52	69	27	24
	No	60	25	138	18	13
Total		**121**	**77**	**207**	**45**	**37**

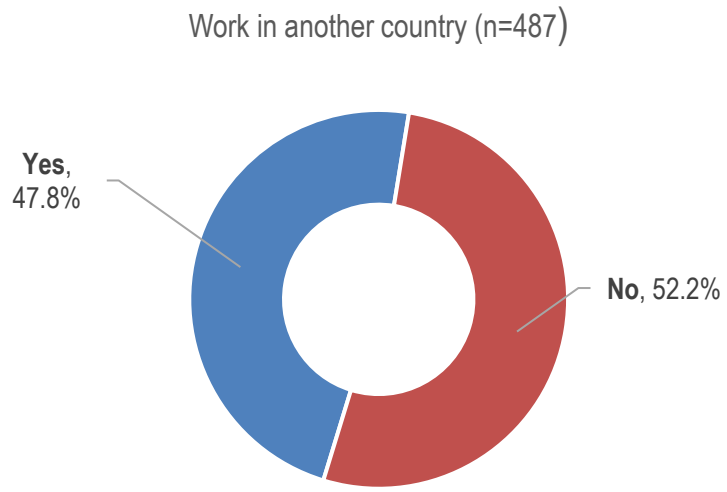


Figure 3.30 Overall answer for thinking to work in another country (n=487)

3.18 Interest in continuing study

The data shown in Table 3.18 assesses the interest level among graduates from five universities in continuing their education (pursuing a Master's or Doctorate degree). The analysis is based on n=475 respondents. The most significant finding is the overwhelmingly high overall interest in pursuing postgraduate education: 93.3% (443 out of 475) of all surveyed graduates are interested in continuing their education. Only 6.7% (32 out of 475) are not interested. It shows that Graduates from UNITAL and UNPAZ show the highest interest, with over 94% planning to continue their studies. While still extremely high, graduates from DIT (90.5%) and UNTL (91.7%) are slightly less inclined to pursue further education compared to the other groups. In summary, the data clearly indicates a very strong academic aspiration among recent graduates, regardless of their university affiliation, with nearly all respondents planning to seek a Master's or Doctorate degree.

Table 3.18 The interest level among graduates from five universities in continuing their education (n=475)

Question	Response	UNTL	DIT	UNPAZ	UNITAL	UNDIL
Are you interested in continuing your education (Master's or Doctorate)?	**Interested**	111	67	193	40	32
	Not interested	10	7	11	2	2
Total		**121**	**74**	**204**	**42**	**34**

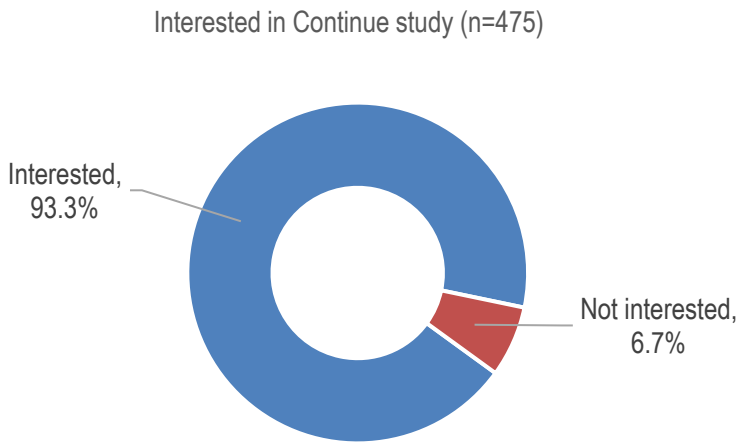


Figure 3.31 Overall interested level of continue their study (n=475)

Key finding:

- The trend of relocating overseas for work is becoming more common. Significant motives include greater employment opportunities, higher wages, and personal and family considerations.
- The data clearly indicates a very strong academic aspiration among recent graduates, regardless of their university affiliation, with nearly all respondents planning to seek a Master's or Doctorate degree.

3.19 What subjects or knowledge should be added to the university curriculum that will benefit your career even more?

The bar chart on Figure 3.32, based on n=509 respondents, identifies the subjects or knowledge areas that graduates believe should be added to the university curriculum to better benefit their careers. The responses clearly indicate a strong desire for more **practical, technical, and applied skills** in their education.

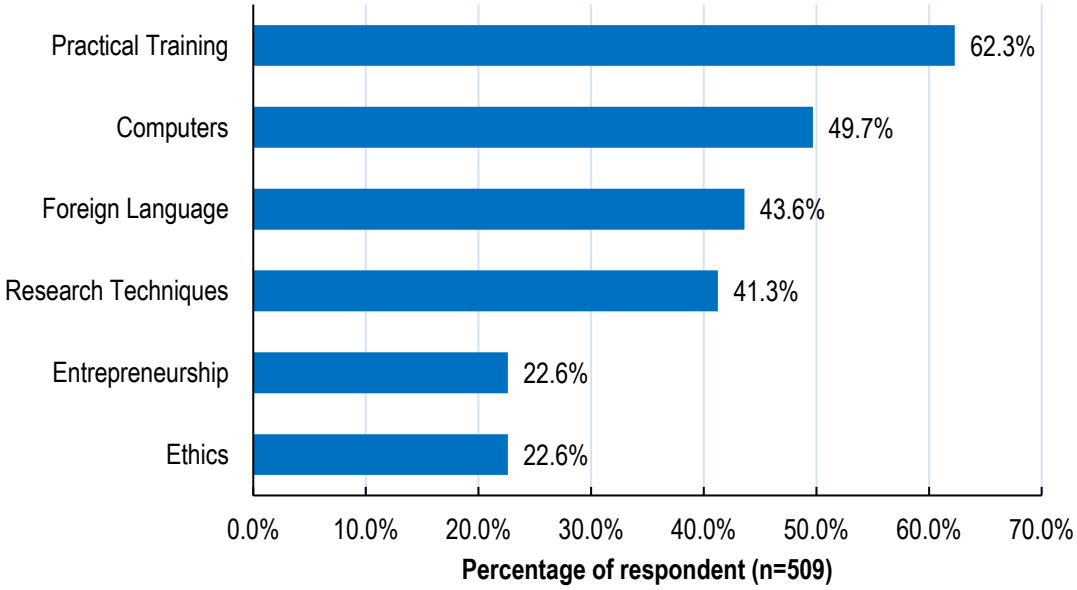


Figure 3.32 Subjects or knowledge areas that should be added to the university curriculum (n=509)

The top three areas requested by graduates all exceed 40% of the responses, highlighting major perceived gaps in their current education:

1. **Practical Training (62.3%):** This is the overwhelming top request, cited by nearly two-thirds of respondents. This suggests a need for more **internships, hands-on projects, simulations, and real-world application** of theoretical knowledge to bridge the gap between academia and the workplace.

2. **Computers (49.7%):** Almost half of the graduates feel they need stronger **computer skills**, which likely encompasses everything from basic digital literacy and software proficiency to more advanced areas like programming, data analysis, or specialized industry software.
3. **Foreign Language (43.6%):** A significant number of respondents feel that **foreign language skills** are necessary for career advancement, reflecting the globalized job market and the potential for working abroad (which was high in a previous chart for some universities).

Overall, Graduates strongly prioritize the highest value on practical experience and technical skills (Practical Training and Computers) as the most beneficial additions to the curriculum. These are followed by competencies that support broader employment mobility and analytical abilities (Foreign Language and Research Techniques). This feedback indicates that universities should consider substantially expanding opportunities for experiential learning and technical skills development to improve graduate employability.

Key finding:

- The responses clearly indicate a strong desire for more practical, technical, and applied skills in their education.
- The top three areas requested by graduates all exceed 40% of the responses, highlighting major perceived gaps in their current education.
- Graduates strongly prioritize the highest value on practical experience and technical skills (Practical Training and Computers) as the most beneficial additions to the curriculum. These are followed by competencies that support broader employment mobility and analytical abilities (Foreign Language and Research Techniques).
- The feedback indicates that universities should consider substantially expanding opportunities for experiential learning and technical skills development to improve graduate employability.

3.20 Current training status and the skills need further development

Shaping the abilities and skills are high required for future career development. Involvement in the training may built the graduates competence and skill based on the industrial demand. Therefore, in this study, we analyzed the current training status of engineering graduates and skill they need to improve further for career development.

3.20.1 Current training status

Bar chart in Figure 3.33 shows the comparison of current training status of engineering graduates of 5 universities. Of 126 respondents from UNTL, only 34(27%) are currently participating in training program, while 92(73.0%) are not. About 37.7% of DIT's engineering graduates are currently participating in the training, while large portion (62.3%) are not participating in any training. UNPAZ graduates' participation in the training program has similar percentage as UNTL with 0.5% portion more compared to the UNTL's. The data also reveals that considering the percentage distribution of current training status with respect to the total respondents, both UNITAL and UNDIL both have identical portion for those who participating in training (both are 43.2%) and not participating in any training (both are 56.8%).

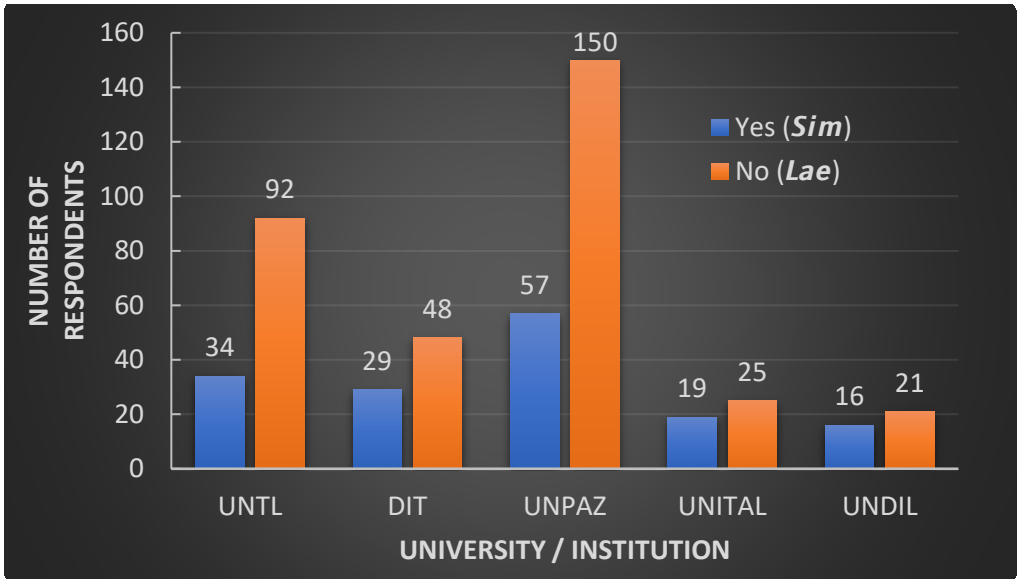


Figure 3.33 Current training status of respondents

Overall, the average training status of 491 engineering graduates from 5 universities in Figure 3.34 shows that only 31.6% are currently participating in the training program, while large portion of 68.4% are not participating in any training at the time the survey was done. Some of the reason why those respondents do not want to participate in any training program may include financial limitation, mismatch between content of the training program and actual industrial demands or some may not need it because the already employed and no time to participate in any training. In general, the further study may be needed in order to focusses on analyzing why larger portion of engineering graduates does not want to participate in any training program.

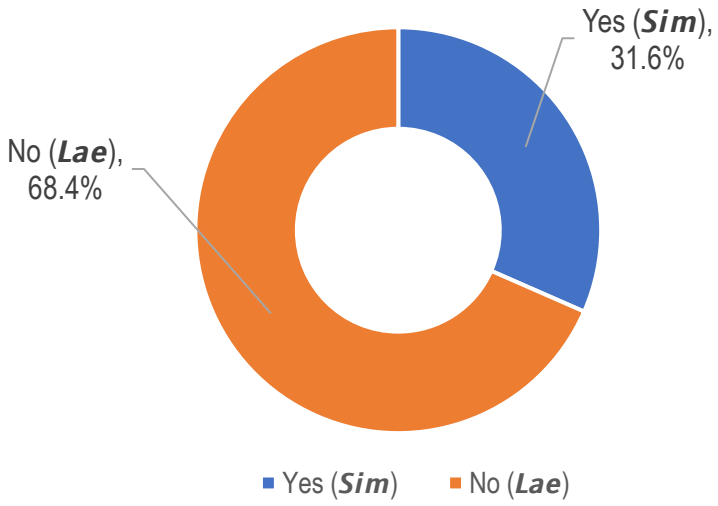


Figure 3.34 Average training status of engineering graduate of 5 universities (n=491)

Key finding:

- Majority of the respondents (68.4%) of all university are not participating in any training programs at the time of the survey was done. Only 31.6% are participating in the training program.
- Financial limitation, time constrains, mismatch between content of the training program and actual industrial demands may be the reasons someone does not interest in participating in training.

3.20.2 The skill / ability to be developed further by graduates

The table 3.19 summarizes the data, showing which abilities the n=360 graduates prioritized for further development **Technical skills** were identified by the largest number of graduates (215 responses, 42.3%) as the ability they believe needs to be developed further. The top three priorities to be developed further are; **Technical skills** dominate the responses as the highest priority, indicating a strong perceived need among graduates for further training in job-specific or technical competency. **Communication & Language** and **Product training** follow as distant second and third priorities. **Adaptability** and **Teamwork** were not mentioned by any respondent as needing further development, suggesting graduates either feel very competent in these areas or do not perceive them as urgent training needs.

Table 3.19 The ability to be developed further by graduates (n=360)

Ability to be developed further	Number of responses	Frequency of respondent
Technical skills	215	42.3%
Communication & Language	54	10.6%
Product training	42	8.3%
Leadership & Management	35	6.9%
Safety and health	5	1.0%
Adaptability	0	0.0%
Teamwork	0	0.0%

Key finding:

- Technical skills were prioritized by graduates for further development (215 responses, 42.3%)
- The top three priorities to be developed further are; Technical skills dominate the responses as the highest priority, indicating a strong perceived need among graduates for further training in job-specific or technical competency. Communication & Language and Product training follow as distant second and third priorities.
- Adaptability and Teamwork were not mentioned by any respondent as needing further development, suggesting graduates either feel very competent in these areas or do not perceive them as urgent training needs.

3.21 Who or what institutions do you think might link you to the job opportunities?

Create link between graduates and job opportunity is important which can bridge the gap between academic and industries need. The link can enhance employability, accelerate the integration into the market, and very effective in skill application.

When asked: "Who or what institutions do you think might link you to the job opportunities?", the survey result in Figure 3.35 shows that, the **Government agency** is overwhelmingly considered the institution most likely to link graduates to job opportunities. The data shows a clear preference for governmental bodies as the primary link to employment for the n=149 respondents. The top three institutions are; Nearly **two-thirds (67.8%)** of graduates believe a government agency is the most likely source for job opportunities. The **Alumni association** plays a significant, though much smaller, role, cited by about **one-fifth (20.8%)** of respondents, and the **University** itself is seen as a link to job opportunities by **10.1%** of graduates.

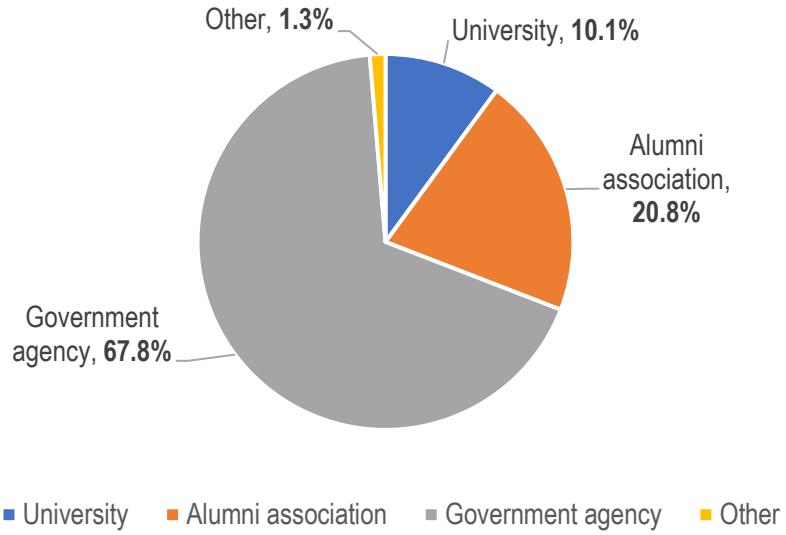


Figure 3.35 Who or what institutions may *link* graduate *to the job opportunities* (n=149)

Key finding:

- The Government agency is considered as the institution most likely to link graduates to job opportunities compared to the Alumni association and University compared to Alumni-association and University

EMPLOYERS PRESPECTIVE

4.1 Way of communicate a job vacancy to the public

Based on the survey done to the engineering graduate students, 26.8% of the respondents cited they cannot find the job, about 8.4 % cite lack of work (Vacancy) information and 3.9 % don't know where to find the job. Meaning there might less information relation to the publication of the job vacancy. Therefore, in this study, we performed a trace survey to some major company and institutions to understand the employability from employers' perspective. The result how those company and institutions communicate their job vacancy is shown in the Table 3.20.

This table provides feedback from **four employers** (n=4) on their methods for communicating job vacancies. The data indicate that employers use a mixture of traditional and digital channels to communicate job vacancies, with a noticeable preference for online platforms.

Table 3.20 Communication way for employers in communication job vacancy

Communication methods	**Number of respondent (n=4)**
Public announcement in local newspaper	2
Local TV	1
Letter to university	0
Government agency	1
Company/office website	3
Special recruitment through MoU or collaboration with Higher education institution	1
Other: Social media	1

The company or office website is the most frequently used method, chosen by three out of four respondents, suggesting that employers consider their own digital spaces as the most effective and efficient way to reach potential applicants. Public announcements in local newspapers remain relevant, used by half of the employers, demonstrating that traditional media continues to complement online strategies, especially for targeting local audiences. Other methods, such as; local TV, government agencies, special recruitment through MoU or collaboration with academic institutions, and social media, are used by only one employer each, indicating that these approaches are more situational or specialized. Interestingly, none of the employers use letters to universities, reflecting a shift away from direct institutional communication toward broader, more accessible platforms. Overall, the findings highlight a clear trend toward digitalization in recruitment practices, while still maintaining some reliance on traditional outreach channels.

4.2 Qualities, Abilities, and/or Skills Required by Employers

4.2.1 General Quality, Ability and/or Skills needed by employer

The feedback from employers reveals that organizations prioritize a combination of technical competence, soft skills, and professional values when hiring engineering graduates.

EDTL's emphasis on recruiting fresh graduates holding a Diploma III or bachelor's degree indicates that formal educational qualifications remain a fundamental entry requirement. Beyond academic credentials, companies such as Tsuneishi Timor Shipbuilding (TTS) place considerable importance on personal values—including teamwork, commitment, ownership, integrity, and leadership—highlighting the growing expectation that engineers must demonstrate strong character and a positive work ethic. Tsuneishi also underscores critical transferable skills such as time management, communication, adaptability, problem-solving, and interpersonal skills, along with the ability to work openly within diverse teams, reflecting the collaborative nature of modern engineering environments.

Obras Pública emphasizes the need for specific technical abilities in areas such as civil engineering, architecture, electrical engineering, and IT engineering. This suggests that specialized technical expertise is essential for supporting national infrastructure and housing programs, reinforcing the importance of discipline-specific competencies. Similarly, Timor GAP outlines a balanced set of expectations that include technical knowledge, practical hands-on ability, problem-solving and analytical skills, communication skills, flexibility, teamwork, work ethics, and attitude. These requirements demonstrate that employers increasingly value graduates who can apply their technical training to real-world situations while also displaying strong interpersonal and professional attributes.

Key finding:

Overall, the findings indicate that employers seek well-rounded engineering graduates who combine technical proficiency with strong soft skills, ethical behavior, adaptability, and the ability to function effectively in diverse and multidisciplinary teams. This reflects the evolving demands of the engineering profession, where both technical mastery and human-centered skills are essential for workplace success.

4.2.2 Specific Skills Seeking by Employers

When asked what specific skills the company seeking when hiring an engineering graduate, the responses from employers reveal that the demand for engineering graduates is strongly centered on **technical specialization**, complemented by the ability to apply these skills in real-world engineering contexts. Across all organizations, the expectation is that graduates should possess not only foundational knowledge within their engineering discipline but also practical, industry-relevant skills.

- **EDTL** highlights the need for graduates with competencies in **electrical, mechanical, and information technology,** as well as **energy management,** reflecting the organization's focus on infrastructure, utilities, and energy systems.

This indicates that multidisciplinary technical knowledge is increasingly valued, especially in sectors transitioning toward modern and efficient energy solutions.

- **Tsuneishi** emphasizes a more application-oriented skill set, where graduates must demonstrate the ability to **understand rather than memorize.** Skills such as **2D–3D drawing conversion, isometric analysis, and spatial reasoning** are critical, suggesting a strong emphasis on design interpretation and the ability to visualize engineering concepts—a key requirement in manufacturing, shipbuilding, and project-based engineering environments.
- **Obras Pública** provides a more detailed breakdown, underscoring the importance of **CAD design, 3D modeling, programming,** and specialized technical knowledge across various engineering fields. Civil engineers are expected to have competencies in **structural analysis, construction management, and cost estimation**, while electrical engineers need skills in **circuit design, power systems, and control systems.** Mechanical engineers are expected to understand **fluid mechanics and mechanical design.** This comprehensive list demonstrates the organization's need for graduates who can immediately contribute to complex infrastructure and construction-related projects.
- **Timor GAP** offers an even more industry-specific perspective, particularly in the field of **drilling engineering.** The organization requires graduates with a solid understanding of **drilling fundamentals, well planning and design, data analysis,** and **operational monitoring skills**, along with knowledge of **industry standards** such as API and IADC guidelines. In addition to technical proficiency, Timor GAP emphasizes operational awareness—understanding rig systems, well control, drilling equipment, and field procedures. The role also demands strong **problem-solving**, **digital skills**, and the ability to use data monitoring tools and engineering software. Soft skills—such as technical communication, reporting, teamwork, and collaboration—are equally important, highlighting that graduates must function effectively in multidisciplinary and high-pressure operational environments.

Key finding:

- Overall, the findings indicate that employers seek engineering graduates who possess a strong combination of technical depth, practical application skills, digital competency, and effective communication abilities.
- Across sectors, there is a clear expectation for graduates to be job-ready, capable of interpreting technical information, solving operational problems, and working collaboratively within specialized engineering teams. This demonstrates that modern engineering roles demand not only academic knowledge but also hands-on experience, analytical thinking, and a high degree of professional adaptability.

The table 3.21 presents employers survey on the importance of various skills, showing a strong consensus that nearly all listed skills are considered Highly Important for employees.

Four skills were rated as Very Important (75%) or Extremely Important (25%) by all respondents (100%):

1. **Basic Skills** (reading, writing, listening, speaking, math, etc.): 100% rated as Very or Extremely Important.
2. **Practical skill** (Abilities to perform tasks in real-world situations): 100% rated as Very or Extremely Important.
3. **Problem solving skill** (making, creative thinking, reasoning skills, ability to learn, etc.): 100% rated as Very or Extremely Important.
4. **Adaptability** (ability to adapt to changing work environments): 100% rated as Very or Extremely Important.

This indicates that employers fundamentally value the ability of a candidate to learn, adapt, perform practical tasks, and possess strong foundational literacy/numeracy.

Three skills showed a slightly wider distribution, with 25% of respondents rating them as Moderately Important: Foreign language skill, communication skills, and computer skill.

Leadership skill shows the largest percentage in the Moderate Important column at 50%, with the remaining 50% split between Very and Extremely Important. This suggests that while leadership is necessary, it might not be a top-tier priority for *all* entry-level or operational roles, unlike basic skills and professionalism.

Table 3.21 The employers survey on the importance of various skills, showing a strong consensus that nearly all listed skills are considered Highly Important for employees

	Not important at all	Slightly Important	Moderate Important	Very Important	Extremely Important
Basic Skills (reading, writing, listening, speaking, math, etc.)	0%	0%	0%	**75%**	**25%**
Practical skill (Abilities to perform tasks in real-world situations)	0%	0%	0%	**75%**	**25%**
Foreign language skill (Ability to communicate, write, listen, and read specific foreign language)	0%	0%	**25%**	**50%**	**25%**
Professionalism (acting in a responsible manner, maturity, self-confidence, honest, and with integrity.	0%	0%	0%	**50%**	**50%**
Problem solving skill (making, problem solving, creative thinking, reasoning skills, ability to learn, etc.)	0%	0%	0%	**75%**	**25%**
Communication Skills (Able to communicate and working with people from diverse backgrounds, multicultural competence)	0%	0%	**25%**	**50%**	**25%**
Leadership skill (taking responsibility for actions, goal oriented, friendly, open, honest, etc).	0%	0%	**50%**	**25%**	**25%**
Computer skill (working with computers and other technology, selecting right tools, equipment, hardware, and software for a job, and application of knowledge to tasks, etc.)	0%	0%	**25%**	**50%**	**25%**
Adaptability (ability to adapt to changing work environments)	0%	0%	0%	**75%**	**25%**

In summary, the data clearly shows that employers place an exceptionally high value on all listed skills. The most essential attributes are Basic Skills, Practical Skills, Problem Solving, Adaptability**,** and, most importantly, Professionalism. While technical and communicative skills are vital, character and foundational abilities are non-negotiable for these surveyed employers.

In addition to the above important skill, there are some skills that are not included in the Table 3.21, but considered extremely important for the employers. The responses indicate that employers recognize several additional skills—beyond those previously listed—as **extremely important** for engineering graduates. These skills reflect evolving workplace demands, highlighting the need for graduates to demonstrate not only technical competence but also a strong capacity for personal and professional growth.

- **EDTL** emphasizes the importance of the ability to **apply technical knowledge within society**, indicating that graduates must understand the broader societal and practical implications of engineering solutions. Additionally, the ability to **evaluate and analyze** reflects the expectation that engineers must think critically and assess situations effectively before making decisions.
- **Tsuneishi** identifies **interpersonal skills** and **time management** as essential, underscoring the significance of effective teamwork, collaboration, and the ability to manage workloads efficiently—skills that are critical in fast-paced engineering environments.
- **Obras Pública** highlights a broader set of attributes, including **creativity**, **adaptability**, **technical knowledge**, **teamwork**, and **communication skills**. This combination suggests that employers value engineers who can innovate, adjust to changing circumstances, communicate clearly, and work collaboratively across disciplines.
- **Timor GAP** introduces a distinct dimension by emphasizing the importance of a **"willingness to learn"**, recognizing that engineering roles often require continuous skill development and adaptation to new technologies and methodologies. The encouragement of **women graduate engineers** also reflects an organizational commitment to diversity and inclusion, indicating

that employers value varied perspectives and aim to promote gender balance in engineering fields.

Key finding:

Overall, the findings show that employers place strong importance on holistic professional qualities, such as adaptability, creativity, interpersonal skills, ethical attitudes, and lifelong learning. These attributes complement technical knowledge and are increasingly seen as essential for success in modern engineering roles.

KEY FACTORS, TRENDS, CHALLENGES and OPPORTUNITIES

5.1 Key Factors Influencing Employability

Through this study, we identified some key factors that influencing Employability are as follow:

- **Technical Competence**

  Knowledge in engineering fundamentals, CAD, 3D modeling, programming, drilling fundamentals, structural analysis, power systems, etc.

- **Practical/Hands-on Skills**

  Ability to apply theory to real-world tasks, operate tools, analyze data, and interpret technical drawings and standards.

- **Soft Skills and Professional Behavior**

  Communication, teamwork, adaptability, time management, interpersonal skills, and strong work ethic.

- **Learning Attitude**

  Willingness to learn and adapt to new technologies, methods, and work environments.

- **Digital Literacy**

  Knowledge of engineering software, monitoring systems, and data analysis tools.

- **Creativity and Problem-Solving**

  Capacity to innovate, troubleshoot, and evaluate complex engineering issues.

- **Industry Exposure**

  Internships, project-based learning, and practical experience increase readiness.

- **Diversity and Inclusion**

  Employers increasingly value diverse teams and encourage women engineers.

5.2 Employability Trends Based on Employers' Responses

Based on the employer' responses, the employability trend can be described as follow:

Trend 1: Growing Importance of Multi-Disciplinary Skills

Employers seek graduates with overlapping competencies in civil, mechanical, electrical, IT, and energy systems.

Trend 2: Shift From Memorization to Understanding and Application

Industries prefer graduates who can *interpret, analyze, and apply* technical information rather than rely on theoretical knowledge alone.

Trend 3: High Demand for Digital and Technical Tools

CAD, 3D modeling, programming, data analysis, drilling software, and real-time monitoring tools are increasingly essential.

Trend 4: Rising Value of Soft Skills

Communication, teamwork, adaptability, creativity, and interpersonal skills are considered equally important as technical abilities.

Trend 5: Increased Focus on Lifelong Learning

Employers emphasize "willingness to learn," indicating a trend where continuous upskilling is crucial due to fast technological changes.

Trend 6: Growth in Inclusion and Diversity

Encouragement of women engineers shows a positive trend toward gender inclusion in engineering workplaces.

5.3 Challenges Affecting Employability

Based on the study on the engineering graduate's employability, the challenges that affecting employability of graduate student can be identified as follow:

- **Skill Gaps Between University Training and Industry Requirements**
  Many graduates lack practical experience, design skills, and exposure to real-world engineering tools.
- **Limited Industry Exposure**
  Few structured internships or industry-led training programs reduce graduates' work readiness.
- **Rapid Technological Changes**
  Digital tools evolve quickly, making it difficult for curricula to stay up-to-date.
- **Weak Soft Skills**
  Employers highlight recurring issues in communication, teamwork, and adaptability.
- **Lack of Specialized Technical Training**
  Graduates often lack specific knowledge in drilling engineering, structural analysis, CAD/3D modeling, power systems, and industry standards.
- **Gender Imbalance**
  While women graduates are encouraged, representation remains low, limiting diversity and potential workforce contributions.

5.4 Opportunities for Improving Employability

- **Strengthening University–Industry Collaboration**
  - Offers pathways for curriculum improvement, internships, and graduate recruitment.
- **Growing Sectors (energy, construction, infrastructure, petroleum)**
  - Create new areas for graduate employment and specialization.

- **Digitalization in Engineering**
    - Demand for digital tools opens opportunities for graduates who gain proficiency in new software and data-driven engineering.
- **Focus on Lifelong Learning**
    - Students with the willingness to learn can rapidly adapt and thrive.
- **Support for Female Engineers**
    - Increasing encouragement can boost diversity and create more opportunities for women.
- **Greater Demand for Problem-Solving and Critical Thinking**
    - Graduates who strengthen these skills can stand out in competitive job markets.

5.5 Summary of Findings

The employers' responses reveal several important insights regarding the skills, qualities, and competencies expected from engineering graduates. First, employers use a combination of digital and traditional communication methods when announcing job vacancies, with company websites and newspapers being the most common platforms. This reflects an increasing reliance on digital tools while still acknowledging the relevance of traditional media.

Regarding the qualities and abilities required, employers consistently highlight the importance of technical knowledge, communication skills, teamwork, adaptability, problem-solving, and strong work ethics. These attributes underscore the need for engineering graduates to be both technically competent and well-rounded professionals. Specific technical skills vary by sector but commonly include CAD and 3D modeling, programming, structural analysis, power systems, mechanical design, and, for specialized fields such as drilling engineering, a comprehensive understanding of drilling principles, operational awareness, and analytical capabilities.

Employers also identified additional crucial skills not previously listed, including interpersonal skills, time management, creativity, the ability to apply technical

knowledge to societal needs, and a willingness to learn. Importantly, diversity and inclusion emerged as themes, with encouragement for women engineers to join the workforce.

Overall, the findings indicate strong employer expectations for graduates who possess a balance of technical proficiency, digital competence, soft skills, practical experience, and adaptive mindsets. These results also highlight clear opportunities for higher education institutions to align their curricula more closely with industry demands.

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The study concludes that employability in the engineering sector is shaped by a combination of technical expertise, practical skills, and personal attributes that allow graduates to function effectively in modern work environments. Employers stress that while foundational engineering knowledge is essential, it is the ability to apply this knowledge, through problem-solving, critical thinking, and hands-on competencies, that determines workplace readiness.

Equally important are soft skills such as communication, teamwork, adaptability, and interpersonal relations, as these qualities enable effective collaboration within multidisciplinary teams. The emphasis on qualities like creativity, time management, and willingness to learn reflects the industry's need for agile and innovative professionals who can adapt to rapidly evolving technologies and complex project environments.

The findings also highlight emerging trends, including the growing demand for digital skills, increased focus on practical exposure, and the expanding recognition of diversity and inclusion in engineering workplaces. These trends present both challenges and opportunities for higher education institutions, students, and employers.

To enhance graduate employability, universities must strengthen practical learning experiences, update curricula to align with industry needs, and incorporate soft skill development as a core component of engineering education. Employers, meanwhile, are encouraged to foster stronger partnerships with universities and support inclusive hiring practices. Students should cultivate both technical and soft skills while developing a growth mindset and readiness for continuous learning.

In conclusion, improving engineering graduate employability requires a collaborative effort between education providers, industry, and graduates themselves. By integrating industry-relevant skills, fostering innovation, and supporting lifelong learning,

stakeholders can ensure that engineering graduates are well-prepared to contribute effectively to national development and global engineering challenges.

6.2 Recommendations

6.2.1 Recommendations for Higher Education Institutions (HEIs)

Through this study, we identified some important points from employer's feedback, and formulated following recommendations for Higher Education Institute (HEIs)

1. **Strengthen Practical, Hands-on Training**
    - Integrate more laboratory work, fieldwork, industry projects, and internships to ensure graduates can apply technical knowledge in real-world contexts.
2. **Update Curriculum to Match Industry Demands**
    - Include CAD/3D modeling, programming, structural analysis, power systems, fluid mechanics, IT skills, digital drilling tools, and energy management.
    - Offer specialized elective tracks aligned with industry sectors (civil, mechanical, electrical, IT, drilling engineering).
3. **Enhance Soft Skills Training**
    - Integrate modules on communication, teamwork, interpersonal skills, adaptability, creativity, problem-solving, ethics, and time management.
4. **Promote "Technology and Society" Awareness**
    - Offer courses that help students understand societal impacts, sustainability, and community-based engineering solutions.
5. **Develop Lifelong Learning and "Willingness to Learn" Mindset**
    - Encourage independent learning, research projects, and continuous professional development.

6. **Strengthen University–Industry Partnerships**
    - Establish MoUs for internships, guest lectures, curriculum review, industry-led workshops, and recruitment pipelines.
7. **Encourage Women's Participation in Engineering**
    - Offer mentorship programs, scholarship support, career guidance, and promote gender-inclusive learning environments.

6.2.2 Recommendations for Ministry of Higher Education Science and Culture (MESCC)

1. Establish and socialize the new Decree law on the National standard Curriculum for Higher Education, based on the Law No. 6/2024, 17 July 2024 for Higher Education.
2. Promote the Policy of Triangle partnership (Government - University - Industry) at Inter-ministerial level and HEIs.
3. Review and update the National Standard Curriculum (CPN) for Higher education based on the market demand.
4. Fortify the implementation of the National Qualification Standard (SNQ-TL) and perform periodic reviews on competence standards in order to align with international standard and labor market needs hence improving the employability of graduates.

6.2.3 Recommendations for ANAAA

1. Assure that all HEIs align with the national standard curriculum and its periodical revision (Assessment and Accreditation of study programs).
2. Promote longitudinal research to track graduate' s employability of HEIs (Example: Build an integrated data system).

6.2.4 Recommendations for INDIMO and SEFOPE

1. Strengthen the implementation of the National Action Plan for Youth 2023-2027, with particular emphasis on providing capacity building for freshly graduated students to prepare them for employment opportunities based of market demand.
2. Upgrade and improve the LABOUR MARKET INFORMATION SYSTEM (LMIS) especially the SIMU-Web system platform ("*Sistema Informasaun Merkado Traballu*") to provide accessible labor market information, support job seeker, and connect job supply and demand efficiently and effectively. The system needs to be accessible online in order for job seekers to access the job vacancies and other labor market information.

6.2.5 Recommendations for Engineering Graduates

1. Adopt long-life learning in order to remain aligned with the knowledge, skill and competencies required by employers.
2. Strengthen soft skills such as communication, teamwork, adaptability, and interpersonal relations by participating in the related training program.
3. Take a proactive approach to the job search by exploring opportunities and engaging actively with potential employers.
4. Get involved in the alumni network for information and job opportunities, mentorship from experienced alumni and building network and communication for career advancement.

REFERENCES

Bartlett, J. E., Kotrlik, J. W., & Higins, C. C. (2001). Organizational Research: Determining appropriate Sample size in Survey Research. *Information Technology, Learning, and Performance Journal, 19*(1), 43-50.

Cheng, M., Adekola, O., Albia, J., & Cai, S. (2022). Employability in higher education: a review of key stakeholders' perspectives. *Higher Education Evaluation and Development, 16* (No. 1), pp. 16-31. https://doi.org/10.1108/HEED-03-2021-0025

Creswell, J. W., & Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). SAGE Publications, Inc.

Diem, P. T., & Ha, N. M. (2013). Analyzing the Employment Status of Graduate Students: The Case of Kent International College in Vietnam. *Advances in Management & Applied Economics, 3*(4), 235-248.

Gamito, C. A., & Rei, D. (2023). *Labour market policies for the youth in Timor-Leste : a Mapping exercise* (1 ed.). Indonesia: International Labour Organization.

Gomes, D. C., & Carlos, d. C. (2024). *Labor Market Absorption Rate of Graduates of Health Science Study Program from UNTL, UNPAZ, ICS, UNDIL, withing the Last Five Years (2019-2023).* Staten House U.S.A.

Gomes, D., & Carlos, d. C. (2023). *Taxa de Absorção no Mercado de Trabalho de Graduados da UNTL, ISC, UNDIL, UNPAZ, IOB, DIT nos Últimos Anos (2018-2022) na Área de Estudo de Gestão.* INCT.

Government of Timor-Leste. (2011). *Timor-Leste Strategic Development Plan 2011-2030*. Dili, Timor-Leste: Government

Jackson, D. (2024). The relationship between student employment, employability-building activities and graduate outcomes. *Journal of Further and Higher Education, 48:1*, 14-30. https://doi.org/10.1080/0309877X.2023.2253426

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (April de 2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research, 1*(2), 112-133. https://doi.org/10.1177/1558689806298224

Knight, P. T., & Yorke, M. (2004). Learning, curriculum and employability in higher education. Routledge Falmer. https://doi.org/10.4324/9780203465271

RDTL. (2017). *National Employment Strategy 2017-2030.* RDTL, VI Constitutional Government.

Rowe, A. D., & Zegwaard, K. E. (2017). Developing graduate employability skills and attributes: Curriculum enhancement through work-integrated Developing graduate employability skills and attributes: *Asia-Pacific Journal of Cooperative Education, Special Issue, 18*(2), 87-99.

Sahudin, S., Maideen, N., Wahab, R., & Shuib, N. (2022). Literature Review on the Factors Affecting Employability of Engineering Graduates. *ASEAN Journal of Engineering Education, 6*(1), 13-22. https://doi.org/10.11113/ajee2022.6n1.75

Schoonenboom, J., & Johnson, R. B. (2017). How to Construct a Mixed Methods Research Design. *Cologne Journal of Sociology and Social Psychology, 63*, 107–131. https://doi.org/10.1007/s11577-017-0454-1

Tomlinson, M. (2017). Introduction: Graduate employability in context: Charting a complex, contested and multi-faceted policy and research field. In M. Tomlinson & L. Holmes (Eds.), Graduate employability in context: Theory, research and debate (pp. 1–40). London: Palgrave Macmillan. https://doi.org/10.1057/978-1-137-57168-7

Young, & Ernst. (2018). *Evaluation of labor market supply and demand in Timor-Leste.* Obtido em June de 2024, de Millennium Challenge Corporation (MCC): https://www.laohamutuk.org/econ/MCC/2018/LaborMarketAnalysisSep2018.pdf

Attachments

Appendix A:

Questionnaire of employment status for engineering graduate students

Questionnaire on the Employment Status of Graduates in Engineering (2019-2023) *(UNTL, DIT, UNPAZ, UNITAL, and UNDIL)*

Please fill in the blank and/or check ✓ in ☐ that matches your experience the most.

Favór prenxe iha fatin mamuk no/ou marka ho ✓iha ☐ne'ebé adekuadu liu ho ita-boot nia esperénsia.

Part 1. General Information / *Parte 1. Informasaun jerál*

1. Name / *Naran* :.....
2. Student ID / *Númeru estudante* : .....
3. Gender / *Jéneru* : ☐ Male / *Mane* ☐ Female / *Feto*
4. Age / *Idade* : .....
5. Year of graduation /*Tinan graduasaun* : .....
6. Degree / *Nivel estudu* : .....
7. Name of University / Institute / *Naran universidade:* .....
   Faculty / *Fakuldade*: ..... Department / program/ *Departamentu*: .....
8. Area of Specialization / *Area espesialidade* : .....
9. Present address / *Hela fatin* : .....
   Tel. (WA) / *Telefone (WA)* : .....
   Email :
10. Present working status / *Estatus servisu atuál*
    - ☐ Unemployed / *La servisu* (**Skip Part 2 and 3** /Hakat liu parte 2 no 3)
    - ☐ Continue Study / *Kontinua estudu* (**Skip part 2, 3 and 4**/ Hakat liu parte 2 no 3)
    - ☐ Employed / *Servisu ona* (**Skip Part 3 no 4** / Hakat liu parte 3 no 4)
    - ☐ Employed and Continue study / *Servisu no Kontinua estudu* (**Skip Part 2 and 4** / Hakat liu parte 2 no 4)

Part 2. For Employed Graduates / *Parte 2. Ba Graduadu ne'ebé servisu ona*

1. Types of job / *Tipu husi servisu*

   - ☐ Government officers / *Funsionariu públiku*
   - ☐ State-owned enterprise / *Funsionariu IP no EP*
   - ☐ Private sectors / *Setór privadu*
   - ☐ Run an independent business/Owner/New entrepreneur / *Negosiu ka kompañia rasik*
   - ☐ Employees of foreign/international organizations / *Funsionariu ba kompañia ka organizasaun no ONG internsionál*
   - ☐ Others (Please specify) / *Seluk*: .....

2. Present workplace / *Fatin servisu atual*
   Organization / Company Name / Naran organizasaun/kompañia : .....
   Address of present workplace / *Lokalizasaun fatin servisu*: .....

3. Job position / *Pozisaun servisu*: .....

4. Salary or Average Incomes / *Averajen Salariu ou rendimentu* : ..... dollars per month / *kada fulan*

5. After graduating, how long did it take you to get employed?
   Depois graduasaun, ita-bo'ot presija tempu hira atu hetan servisu?

   ☐ Get a job before graduation or get a job immediately after graduation
   Servisu ona antes graduasaun ou hetan servisu kedas depois-de graduasaun

   ☐ Under 3 months ☐ 3-6 months ☐ 7-12 months ☐ More than 1 year ☐ More than 2 years
   Menus husi fulan 3 *Fulan 3-6* *Fulan 7 – 12* *Liu tinan 1* *Liu tinan 2*

   ☐ The same job as before studying or getting a job while studying
   Servisu nebe hanesan molok eskola ou hetan servisu wainhira sei eskola hela

6. Does your work match the field that you graduated from? / *Servisu ne'e tuir duni / koresponde ho ita-boot nia area estudu?*
   ☐ Match / *koresponde* ☐ Slightly / *koresponde uituan* ☐ Did not Match / *La koresponde*

7. To what extent can you apply knowledge from your field of study to your current job?
   Too pontu ne'ebé mak ita-boot bele implementa ita-bo'ot nian area estudu iha servisu atuál?

   ☐ Most / *Barak liu* ☐ More / *Barak* ☐ Average / *Naton*
   ☐ Less / *menus* ☐ Least / *menus liu* ☐ None / *Laiha liu*

8. Do you think which engineering skills helps you to get the job?
Ita-boot konsidera abilidade enjenharia ida nebe mak ajuda ita-boot hetan servisu?

☐ Foreign language skill / *Lingua estranjeiru*
☐ Computer skill / *Komputador, programasaun*
☐ Communication skill / *Komunikasaun*
☐ Practical skill / *Prátika*
☐ Problem solving skill / *Fo solusaun*
☐ Leadership skill / *Lideransa*
☐ Others (Please specify) / *Seluk* : .....

9. Do you satisfy with your work? / *Ita-boot satisfáz ho ita-boot nia servisu?*

☐ Yes / *satisfáz* ☐ No / *La satisfáz*

If not, please specify the most important reason from the choice below
*Se **NO / La satisfáz**, favor hili ou mensiona razaun importante sira hanesan tuir mai:*

☐ Bad system
Sistema ladun diak
☐ Bad colleagues
Kolega servisu ne'ebé ladun diak
☐ Did not use knowledge learned
La uza koñesementu ne'ebé aprende ona
☐ Lack of stability
Menus estabilidade
☐ Low wages
Salariu kiik
☐ Others (Please Specify): .....
Seluk

10. Are you thinking of going to work in another country?
Ita-bo'ot hanoin atu ba servisu iha nasaun seluk?

☐ Yes / *Sim* ☐ No / *Lae*

11. Are you interest in continuing your education (Master's or Doctorate)
Ita-bo'ot interese atu kontinua Ita-bo'ot nia estudu (Mestradu ou doutoramentu)

☐ Interested / *Interese* ☐ Not Interested / *La interese*

12. Have you set your personal goal for your career development for 5-10 years coming?
Ita-bo'ot interese atu kontinua Ita-bo'ot nia estudu (Mestradu ou doutoramentu)

☐ Yes / *Sim* ☐ No / *Sidauk*

13. Are you currently undergoing any training? *Ita-bo'ot tuir hela formasaun ruma?*

☐ Yes / *Sim* *(Please especify/ Favór espesifika)* .....
☐ No / *Lae* *(Preferred training / prefere formasaun)*.....

14. What skill do you feel needed to improve or develop further to succeed in your career?
Abilidade saida mak ita-bo'ot presija atu melloria ou dezenvolve liu tan hodi bele susesu iha karreira?

(Please specify / *Favór espesifika*) :

Part 3. For Employed Graduates and Continue study / *Parte 3. Ba Graduadu ne'ebé servisu ona no kontinua hela estudu*

1. Types of job / *Tipu husi servisu*
   - ☐ Government officers / *Funsionariu públiku*
   - ☐ State-owned enterprise / *Funsionariu IP no EP*
   - ☐ Private sectors / *Setór privadu*
   - ☐ Run an independent business/Owner/New entrepreneur / *Negosiu ka kompañia rasik*
   - ☐ Employees of foreign/international organizations / *Funsionariu ba kompañia ka organizasaun no ONG internsionál*
   - ☐ Others (Please specify) / *Seluk*: .....

2. Present workplace / *Fatin servisu atual*
   Organization / Company Name / Naran organizasaun/kompañia :.....
   Address of present workplace / *Lokalizasaun fatin servisu*: .....

3. Job position / *Pozisaun servisu*: .....

4. Salary or Average Incomes / *Averajen Salariu ou rendimentu* : ..... dollars per month / *kada fulan*

5. After graduating, how long did it take you to get employed?
   Depois graduasaun, ita-bo'ot presija tempu hira atu hetan servisu?
   a. Get a job before graduation or get a job immediately after graduation
      Servisu ona antes graduasaun ou hetan servisu kedas depois-de graduasaun
   b. Under 3 months ☐ 3-6 months ☐ 7-12 months ☐ More than 1 year ☐ More than 2 years
      Menus husi fulan 3 Fulan 3-6 Fulan 7 – 12 Liu tinan 1 Liu tinan 2
   c. The same job as before studying or getting a job while studying
      Servisu nebe hanesan molok eskola ou hetan servisu wainhira sei eskola hela-

6. Does your work match the field that you graduated from? / *Servisu ne'e tuir duni / koresponde ho ita-boot nia area estudu?*
   a. Match / *koresponde* ☐ Slightly / *koresponde uituan* ☐ Did not Match / *La koresponde*

7. To what extent can you apply knowledge from your field of study to your current job?
   Too pontu ne'ebé mak ita-boot bele implementa ita-bo'ot nian area estudu iha servisu atuál?
   a. Most / *Barak liu* ☐ More / *Barak* ☐ Average / *Naton*
   b. Less / *menus* ☐ Least / *menus liu* ☐ None / *Laiha liu*

8. Do you think which engineering skills helps you to get the job?
Ita-boot konsidera abilidade enjenharia ida nebe mak ajuda ita-boot hetan servisu?

a. Foreign language skill / *Lingua estranjeiru*
b. Communication skill / *Komunikasaun*
c. Problem solving skill / *Fo solusaun*
d. Others (Please specify) / *Seluk* : .....

☐ Computer skill / *Komputador, programasaun*
☐ Practical skill / *Prátika*
☐ Leadership skill / *Lideransa*

9. Do you satisfy with your work? / *Ita-boot satisfáz ho ita-boot nia servisu?*

a. Yes / *satisfáz* ☐ No / *La satisfáz*

If not, please specify the most important reason from the choice below
*Se **NO / La satisfáz**, favor hili ou mensiona razaun importante sira hanesan tuir mai:*

b. Bad system
Sistema ladun diak
☐ Bad colleagues
Kolega servisu ne'ebé ladun diak
☐ Did not use knowledge learned
La uza koñesementu ne'ebé aprende ona

c. Lack of stability
Menus estabilidade
☐ Low wages
Salariu kiik
☐ Others (Please Specify): .....
Seluk

10. Are you thinking of going to work in another country?
Ita-bo'ot hanoin atu ba servisu iha nasaun seluk?

a. Yes / *Sim* ☐ No / *Lae*

11. Have you set your personal goal for your career development for 5-10 years coming?
Ita-bo'ot interese atu kontinua Ita-bo'ot nia estudu (Mestradu ou doutoramentu)

☐ Yes / *Sim* ☐ No / *Sidauk*

12. Are you currently undergoing any training? *Ita-bo'ot tuir hela formasaun ruma?*

a. Yes / *Sim* *(Please especify/ Favór espesifika)* .....
b. No / *Lae* *(Preferred training / prefere formasaun)*.....

13. What skill do you feel needed to improve or develop further to succeed in your career?
Abilidade saida mak ita-bo'ot presija atu melloria ou dezenvolve liu tan hodi bele susesu iha karreira?

(Please specify / *Favór espesifika*) : .....

Part 4. For Unemployed Graduates / *Parte 4. Ba Graduadu sira ne'ebé seidauk servisu*

1. Please specify major reasons why you do not get a job after graduation? You can choose multiple choices.
   Favór deskreve razaun tamba saida mak ita-bo'ot la hetan servisu depois graduasaun? Bele hili liu ida.

- ☐ Do not interested in working
  La interese atu servisu
- ☐ Cannot find a job / *La hetan servisu*
- ☐ I do not know where to find jobs.
  La hetene atu buka servisu iha ne'ebé estudu
- ☐ I do not want to apply
  Lakohi atu konkore ou aplika
- ☐ Low wages/salary / *Salariu kiik liu*
- ☐ Health problems / *Problema saude estranjeiru*
- ☐ Lack of computer skills
  Menus abilidade komputadór
- ☐ My GPA does not meet their requirements
  GPA la prenxe rekezitu
- ☐ Waiting for an answer from agency
  Hein hela rezultadu husi ajensia
- ☐ Want to be a freelance / *Hakarak freelance deit*
- ☐ I cannot find any relevance job to my education
  La hetan servisu ne'ebe tuir hau-nia area
- ☐ Lack of work (Vacancy) information
  Menus informasaun ba vaga
- ☐ I failed an examination / *La pasa iha teste*
- ☐ Lack of foreign language skill / *Menus abilidade lingua*
- ☐ Lack of work experience
  Menus esperénsia sevisu
- ☐ Others (Please specify): .....
  Seluk/ Favór espesifika

2. Who or what institutions do you think might link you to the job opportunities?
   Se ou Instituisaun ne'ebé mak ita-bo'ot hanoin katak bele liga ita-bo'ot ba oportunidade servisu sira?

- ☐ University / *Universidade* ☐Alumni association / *Asosiasaun Antigus Alunus* ☐Government agency / *Ajénsia governu*
- ☐ Others (please specify) / *Seluk :* .....

3. Are you thinking of going to work in another country?
   Ita-bo'ot hanoin atu ba servisu iha nasaun seluk?

a. Yes / *Sim* ☐ No / *Lae*

4. Are you interest in continuing your education (Master's or Doctorate)
   Ita-bo'ot interese atu kontinua Ita-bo'ot nia estudu (Mestradu ou doutoramentu)

☐ Interested / *Interese* ☐ Not Interested / *La interese*

5. Have you set your personal goal for your career development for 5-10 years coming?
   Ita-bo'ot interese atu kontinua Ita-bo'ot nia estudu (Mestradu ou doutoramentu)

☐ Yes / *Sim* ☐ No / *Sidauk*

6. Are you currently undergoing any training? *Ita-bo'ot tuir hela formasaun ruma?*

   ☐ Yes / *Sim (Please especify/ Favór espesifika)* .....

   ☐ No / *Lae (Preferred training / prefere formasaun)*.....

7. What skill do you feel needed to improve or develop further to succeed in your career?
   Abilidade saida mak ita-bo'ot presija atu melloria ou dezenvolve liu tan hodi bele susesu iha karreira?

   (Please specify / *Favór espesifika*) : .....

Part 5. Suggestions / *Parte 5. Sujestaun*

1. What subjects or knowledge should be added to the Universities / institute's curriculum that will benefit your career even more? (You can choose more than 1 item)
   Dixiplina ka koñesementu saida mak presija aumenta ba kurrikulum universidade / institutu atu bele benefisia liu-tan iha ita-bo'ot nia kareira? (Bele hili liu ida)

   ☐ Practical Training / *Treinamentu prátika*
   ☐ Computer / *Komputadór*
   ☐ Ethics / *Étika*
   ☐ Foreign Languages / *Lingua estranjeiru*
   ☐ Research Techniques / *Téknika peskija*
   ☐ Entrepreneurship / *Empreededorizmu*
   ☐ Others (Please specify) / *Seluk* / *Favór espesifika:* .....

2. Suggestions about the major and program (if any)
   Sujestaun kona-bá Dixiplina ka programa (Karik iha)

.....

.....

.....

.....

.....

3. Suggestions about learning/teaching activities (if any)
   Sujestaun kona-bá atividade aprendizajem ka ensinu (Karik iha)

.....

.....

.....

.....

.....

4. Suggestions about student activity (if any)
Sujestaun kona-bá atividade estudante nian (Karik iha)

Questionnaire Response Date: Date ..... *Month* ..... *Year*

.....

Data resposta ba Inkeritu : Data Fulan Tinan

Appendix B:

Questionnaire for Employers

Questionnaire on the Employment Status of Graduates in Engineering (2019-2023) *(UNTL, DIT, UNPAZ, UNITAL, and UNDIL)*

FOR EMPLOYER

Please fill in the blank and/or check ✓in ☐that matches your experience the most.

Favór prenxe iha fatin mamuk no/ou marka ho ✓iha ☐ne'ebé adekuadu liu ho ita-boot nia esperénsia.

Part 1. General Information of Employer

1. Name of organization/ Company : .....
2. Address : .....
3. Name of respondent : .....
4. Gender : ☐ Male ☐ Female
5. Respondent's occupation : .....
6. Tel. (WA) : .....
   Email : .....

Part 2. Research Questions for Employer

1. How do you communicate a job vacancy in your office/company to the public ?

   ☐Public announcement in local newspaper
   ☐Local TV
   ☐Letter to university
   ☐Government agency
   ☐Company/office website
   ☐ Special recruitment through MoU or collaboration with Higher education institution
   ☐Others (Please specify) .....

2. What qualities, abilities, and/or skills are you looking for when employing an engineering graduate?

3. What specific skills are you seeking when you hire an engineering graduate?

4. There are several factors that could be crucial when recruiting an engineering graduate. Please assist us in identifying the most significant elements for personnel selection by rating the importance of each factor listed below.

	Not important at all	Slightly Important	Moderate Important	Very Important	Extremely Important
Basic Skills (reading, writing, listening, speaking, math, etc.)	☐	☐	☐	☐	☐
Practical skill (Abilities to perform tasks in real-world situations)	☐	☐	☐	☐	☐
Foreign language skill (Ability to communicate, write, listen, and read specific foreign language)	☐	☐	☐	☐	☐
Professionalism (acting in a responsible manner, maturity, self-confidence, honest, and with integrity.	☐	☐	☐	☐	☐
Problem solving skill (making, problem solving, creative thinking,	☐	☐	☐	☐	☐

reasoning skills, ability to learn, etc.)					
Communication Skills (Able to communicate and working with people from diverse backgrounds, multicultural competence)	☐	☐	☐	☐	☐
Leadership skill (taking responsibility for actions, goal oriented, friendly, open, honest, etc).	☐	☐	☐	☐	☐
Computer skill (working with computers and other technology, selecting right tools, equipment, hardware, and software for a job, and application of knowledge to tasks, etc.)	☐	☐	☐	☐	☐
Adaptability (ability to adapt to changing work environments)	☐	☐	☐	☐	☐

5. Are there any additional important skills not included above? If any, please rate the level of importance.

Thank you for completing this survey. If you have any questions, please contact Ruben Jeronimo Freitas at ruben.freitas@untl.edu.tl, or Junior Raimundo da Cruz at junior.raimundo@untl.edu.tl

Questionnaire Response Date: Date ..... *Month* ..... *Year* .....


MINISTÉRIO DO ENSINO SUPERIOR, CIÊNCIA E CULTURA
MESCC
AGÊNCIA NACIONAL PARA A AVALIAÇÃO E ACREDITAÇÃO ACADÉMICA
ANAAA
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