



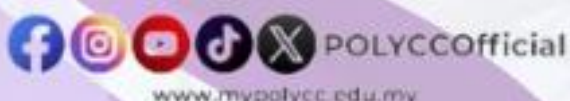
KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI



GRADUATE ACHIEVEMENT AND STAKEHOLDER PERSPECTIVES ON PROGRAMME EDUCATIONAL OBJECTIVES: COHORT 2021

**DIPLOMA IN ELECTRONIC ENGINEERING
(COMMUNICATION)-DEP
ELECTRICAL ENGINEERING DEPARTMENT
POLITEKNIK PORT DICKSON**

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PREFACE

This report presents a study on Graduate Achievement and Stakeholder Perspectives on Programme Educational Objectives (PEO) for the 2021 Cohort Diploma in Electronic Engineering (Communication)-DEP. It is intended to document the extent to which programme graduates have achieved the intended educational objectives, as assessed through both quantitative and qualitative feedback from key stakeholders.

This report also provides the methodology, data analysis, findings, and recommendations that are essential in supporting continuous quality improvement of the programme. This report is organized into six main sections.

Section 1 introduces the study, covering the programme information, synopsis, and the Programme Educational Objectives (PEO) that form the basis of this evaluation.

Section 2 explains the PEO Achievement Measurement Process, including the achievement indicators, assessment instruments, and study design used to evaluate each of the four PEOs.

Section 3 presents the Results and Analysis, covering findings from the questionnaire method and respondent interview protocol, stakeholder feedback on each PEO, and the determination of the overall PEO achievement percentage for the 2021 Cohort.

Section 4 discusses the Discussion and Conclusion drawn from the study, summarizing key insights and their implications for the programme.

Section 5 lists the References used to support this study.

Section 6 contains the Report Verification, confirming the authenticity and accuracy of the findings presented.

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1.0 INTRODUCTION

1.1 Introduction

The Engineering Technology Accreditation Council (ETAC) is a professional body responsible for all engineering programs in Malaysia, the offering institution is required to implement the Outcome-Based Education or the OBE system. The OBE is an educational process which is based on trying to achieve certain specified outcomes in terms of individual student learning. Thus, having decided what are the key things students should understand and be able to do or the qualities they should develop, both structures and curricula are designed to achieve those capabilities or qualities. The designing process involves restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than accumulation of course credits.

In general, the OBE assessment includes three types of outcomes/objectives:

- 1) The Course Learning Outcome (CLO) - being assessed during semester
- 2) The Programme Learning Outcome (PLO) - being assessed at the end of their four-year study and
- 3) The Program Educational Objectives (PEO) - being assessed after 3-5 years of their graduation date.

The PEO are specific goals consistent with the mission and vision of the expressed interest of programme stakeholders describing expected achievements of graduates in their career and professional life after graduation. Criteria of good PEOs are such as distinctive, specific, measurable, achievable, result oriented and having a time frame.

Vision and Mission

Department of Polytechnic and Community College Education (DPCCE) Vision Statement:
To be the Leading-Edge TVET Institution

DPCCE Mission Statement:

- 1) To provide wide access to quality and recognized TVET programmes.
- 2) To empower communities through lifelong learning

- 3) To develop holistic, entrepreneurial, and balanced graduates
- 4) To capitalize on smart partnerships with stakeholders

Port Dickson Polytechnic (PPD) Vision

To be a towering TVET institution globally.

PPD Mission

- 1) Producing quality, holistic and well-balanced TVET graduates with entrepreneurship in order to fulfil the needs of the nation.
- 2) Developing and sustaining smart partnerships with relevant parties locally and internationally.
- 3) To benefit society through education, research and innovation.

PPD Mission Statement

- 1) To produce quality, holistic, and well-balanced TVET graduates with entrepreneurship to fulfil the needs of the nation.
- 2) To develop and sustain smart partnerships with relevant parties locally and internationally.
- 3) To benefit society through education, research and innovation.

The relationship between the PPD mission and the DPCCE mission is depicted in Table 1.1.

Table 1.1: Relation between PPD Missions and DPCCE Missions

DPCCE Mission		PPD Mission		
		Quality, holistic, and well-balanced TVET graduates with entrepreneurship	Develop and sustain smart partnerships with relevant parties locally and internationally	Benefit society through education, Research and innovation
1	To provide wide access to quality and recognized TVET programmes.			√

DPCCE Mission		PPD Mission		
		Quality, holistic, and well-balanced TVET graduates with entrepreneurship	Develop and sustain smart partnerships with relevant parties locally and internationally	Benefit society through education, Research and innovation
2	To empower communities through lifelong learning			√
3	To develop holistic, entrepreneurial, and balanced graduates	√		
4	To capitalize on a smart partnership with stakeholders		√	

1.2 Programme Information

Electrical engineering is the field of study which generally deals with the application of electrical and electronics towards designing, testing and development of circuitry and equipment for well-defined engineering activities. It requires the application of scientific and engineering knowledge and methods combined with practical skills in supporting well-defined engineering activities to prepare students for their future role in the industry.

The electrical engineering diploma graduates of the Polytechnic's Ministry of Higher Education are exposed to a comprehensive curriculum consisting of courses in personal development, mathematics, science, electrical disciplines and workplace competencies requirements. Graduates of the electrical engineering diploma programme will be equipped with specialized knowledge and skills which include power engineering, green technology, energy efficiency, computer technology, communication, medical electronics, optoelectronic and industrial automation.

The Diploma in Electronic Engineering (Communication) (DEP) is a three-year full-time programme comprising of five semesters coursework with one full semester of industrial training.

1.2.1 Synopsis

The DEP covers a broad discipline of electronics engineering, with specialization in communication technology which includes, electrical and electronic fundamentals, computer fundamentals and programming, communication system fundamentals, semiconductor devices, and computer aided design, while emphasizing the area of specialization. The specialization courses include telecommunication network, fibre optic communication system, data communication and networking, wireless communication and microwave devices.

1.3 Programme Educational Objectives

The PEO are statements that describe the expected achievements of graduates in their careers and professional life within three to five years after graduation. Table 1.2 shows the PEOs curriculum version for June 2014, June 2019 and 2024. The measurement of PEOs in this study is based on the PEO 2019 curriculum version, which serves as the reference framework for evaluating graduate achievement in relation to career and professional development outcomes after graduation.

Each PEO for the DEP programme is designed with clearly defined performance indicators that align with the PLOs. These indicators serve as measurable elements that reflect the intended achievements of graduates within 3-5 years after completing the programme. The alignment between PEOs and PLOs ensures that the programme outcomes translate effectively into long-term graduate success, encompassing technical competence, societal contribution, entrepreneurship, and continuous professional development.

Table 1.2: PEOs Description

PEO version June 2014	PEO version June 2019	PEO version 2024	Indicator / Variable measured	Description
PEO 1: Knowledgeable and technically competent in electrical and electronic discipline and able to adapt themselves with new technological challenges in electrical and electronic contribute effectively as a team member with the capability of being a leader	PEO 1: Practicing technician in electrical engineering-related field	PEO 1: Practicing technician in electrical engineering-related field	Technician in the Electrical and Electronic field	Describes a technician who works in any industry and has a job function in the electrical or electronic discipline.
PEO 2: Effective in communication and contribute effectively as a team member with the capability of being a leader	PEO 2: Contributing to society with professional ethics and responsibilities	PEO 2: Contributing to society with professional ethics and responsibilities	Role of graduates	Describes the graduate's involvement in community activities, which includes engineering and non-engineering work related to society, health, and safety. During the activities, the graduate instils awareness of the safety and health culture and suggests environmental and environmental sustainability solutions to the community. In performing the activities, the graduates adhere to professional ethics and responsibilities by following the rules and regulations of the field.

PEO version June 2014	PEO version June 2019	PEO version 2024	Indicator / Variable measured	Description
PEO 3: Capable to solve electrical and electronic problems innovatively, creatively and ethically with social responsibility towards developing country and community	PEO 3: Engaging in enterprising activities that apply engineering knowledge and technical skills	PEO 3: Engaging in enterprising activities that apply engineering knowledge and technical skills	Enterprising Activities	Describes the enterprising activities that require effective communication and contribution from a team member. Enterprising activities involve business in engineering, research, and development (R&D), and technical projects. Enterprising activities can be online or offline businesses. They can also be pursued full-time or part-time.
PEO 4: Able to demonstrate entrepreneurship skills and recognize the needs of life-long learning for successful career advancement	PEO 4: Engaging in activities to enhance knowledge for successful career advancement	PEO 4: Engaging in continuous professional development in response to technological and social challenges.	Career Advancement	Continuous Professional Development (CPD) refers to the ongoing process of acquiring new knowledge, skills, and competencies to stay relevant in an ever-evolving world. As technology advances and societal expectations shift. Students must adapt to remain competitive and effective in their fields.

The relationship between each PEO, its corresponding PLOs, and the key area of assessment is summarised in Table 1.3. This mapping serves as a fundamental reference in assessing the extent to which the programme has successfully produced well-rounded graduates, while also supporting curriculum improvement through feedback integration and stakeholder engagement.

Table 1. 3: PEO-PLO Mapping and Indicators

PEO	Indicator Measured	Assessment Focus
PEO 1	PLO1 – PLO5	Application of engineering knowledge, problem solving, design solutions, investigations, and use of modern engineering tools in the E&E field
PEO 2	PLO6 – PLO8	Professional ethics, societal responsibility, safety, legal awareness, and sustainability considerations in engineering practice
PEO 3	PLO9-PLO 11	Teamwork, communication, leadership, engineering management, and involvement in technical/entrepreneurial activities
PEO 4	PLO12	Lifelong learning through further studies, professional certification, and continuous career development

PEO 1 focuses on the application of engineering knowledge and technical competencies in the Electrical and Electronic (E&E) field. It is mapped to PLO1 to PLO5, which cover engineering knowledge, problem analysis, design/development of solutions, investigation skills, and the use of modern engineering tools. The main assessment focus for this PEO is the graduates' ability to apply technical knowledge effectively in industry practice, particularly in solving engineering problems and performing technical tasks.

PEO 2 emphasizes graduates' ability to demonstrate professional ethics, social responsibility, and awareness of sustainability in engineering practice. It is linked to PLO6 to PLO8, which include understanding societal, health, safety, legal, and cultural issues, evaluating sustainability impacts, and demonstrating ethical responsibilities. The assessment of this PEO focuses on graduates' behaviour in relation to ethical practice, safety compliance, and contribution to sustainable engineering solutions.

PEO 3 highlights graduates' capabilities in teamwork, communication, leadership, and engineering management. This PEO is mapped to PLO9 to PLO11, which cover effective functioning as an individual and team member, effective communication in engineering activities, and application of engineering management principles. The performance indicators include participation in team-based projects, communication effectiveness, leadership roles, and involvement in technical or entrepreneurial activities.

PEO 4 emphasizes continuous professional development and lifelong learning. It is aligned with PLO12, which focuses on the ability to engage in independent and continuous learning in specialized technical knowledge. The assessment criteria for this PEO include further education, attainment of professional certifications, and career progression such as promotions or advancement into senior technical roles.

2.0 PEO ACHIEVEMENT MEASUREMENT PROCESS

PEOs are broad statements that describe the expected career and professional accomplishments of graduates after completing an academic programme. They are formulated to align with the institution's vision and mission while addressing the needs and expectations of industry, society, and national educational aspirations. PEOs are crucial in ensuring that education in a country does not solely focus on theory but also prepares graduates to face the realities of their professional careers. With proper implementation of PEOs, a country can develop a more effective, relevant, and highly competitive educational system. Therefore, the PEO measurement process needs to be carried out by collecting data from alumni, industry and relevant stakeholders. The measurement data, along with triangulation processes, are used to enhance the quality of education so that it aligns more closely with the demands of the job market. A well-executed PEO measurement process helps ensure that graduates possess skills that meet the needs of the current era.

2.1 Introduction

The PEO achievement measurement process is conducted for alumni of the Department of Electrical Engineering, Politeknik Malaysia, who have graduated within the past 3 to 5 years. The process begins with the identification of PEO achievement indicators. These indicators encompass career success and personal development. Subsequently, data is collected through surveys conducted among alumni. The data is then analysed and evaluated to determine the effectiveness of the programme. Follow-up actions include a triangulation process, which involves presenting the PEO achievement analysis to stakeholders such as the Industry Advisory Panel (IAP) and alumni. Finally, reporting and documentation are carried out as part of the quality management and accreditation process. This systematic approach ensures that the academic programme remains relevant and effective in achieving its long-term educational objectives.

2.2 PEO Achievement Indicators

In this context, recommendations from the program's industrial advisors and alumni to improve the PEOs are highly relevant and timely. They aim to enhance the quality of education and strengthen graduates' capabilities in the electrical engineering industry.

These criteria are developed through consultations with industry stakeholders, alumni and the Programme Advisory Committee (PAC), while remaining aligned with national accreditation standards and the principles of OBE. The recommendations from the IAP and alumni regarding the Key Performance Indicator (KPI) for PEOs achievement were discussed and presented in joint meetings on May 5, 2026 (cohort 2021), where a final decision on the targets was established. The results of the discussions and consultations determined that the achievement percentage would serve as a benchmark for evaluating and measuring the success of the PEOs in future cohorts.

Each PEO is assigned a target percentage that represents the minimum level of success expected for the cohort. A PEO is considered achieved when the percentage of graduates meeting the defined expectations equals or exceeds the set target. These criteria are not only used to assess the effectiveness of the programme in preparing graduates for the workforce and lifelong learning, but also to support continuous quality improvement efforts in curriculum development.

Additionally, setting targets provides an opportunity to enhance assessment methods by focusing on objective long-term measurements. This ensures that every decision made over time is based on strong, accurate, and accountable data. This strategy is essential to ensure that the PEO program progresses consistently toward more effective and sustainable goal achievement. More detailed information on the KPI percentage for the 2021 Cohort can be found in Table 2.1, serving as a critical guideline for continuous improvement in Polytechnic academic programs and future graduate success.

Table 2.1: Target KPI for PEOs for Cohort 2021

PEO	Statement	% Target KPI
		2021 Cohort
PEO 1	practicing technician in electrical engineering related field	> 50
PEO 2	contributing to society with professional ethic and responsibilities	> 65

PEO 3	engaging in enterprising activities that apply engineering knowledge and technical skills	> 40
PEO 4	engaging in activities to enhance knowledge for successful career advancements	> 45

2.3 Assessment Instruments

The assessment of PEOs for the DEP programme is conducted systematically to determine the level of achievement among graduates. Each PEO was associated with specific performance indicators and assessed using a set of structured instruments, including alumni questionnaires, employer feedback forms, and triangulation during advisory panel discussions. The aim was to evaluate how well the graduates met the intended objectives based on set performance targets.

Questionnaire instruments are used to obtain data to answer the following objectives:

- i. Addressing curriculum feedback requirements in terms of improving PEO program achievement.
- ii. Discuss how to calculate the percentage of PEO achievement targets that match ETAC Criterion 1.
- iii. Discusses programme improvement and planning in terms of enhancing PEO, PLO, Graduate Employability, and Graduate on Time accomplishment for their respective programmes.

Once finalized, the survey instrument was distributed to the target respondents' students who graduated in the 2021 cohort. The measurement process was conducted from Feb 7, 2026 to Feb 28, 2026. The instrument was distributed online using the Google Form platform to ensure easy access, a high response rate, and more efficient data processing. During this period, students were briefed on the purpose of the study and the importance of their participation in the programme quality evaluation process. Periodic reminders were also sent to encourage participation. This step was crucial in ensuring the reliability of the data collected before the data analysis and PEO achievement reporting process was conducted.

2.4 Study Design

This study adopts a quantitative, survey-based research design to evaluate the achievement of PEOs among graduates of the Department of Electrical Engineering at Malaysian Polytechnics. The design focuses on collecting empirical data from alumni who graduated within three to five years, as well as input from employers and other relevant stakeholders. The primary instrument used is a structured questionnaire consisting of items aligned with each PEO, designed to assess various aspects such as work in field (PEO 1), role of graduates (PEO 2), enterprising activities, research and development, R&D (PEO 3), and activities enhancing knowledge (PEO 4). The study involves a two-phase distribution process, followed by systematic data analysis to identify trends, evaluate programme effectiveness, and support continuous quality improvement (CQI). This design ensures a reliable and valid approach to measuring long-term educational outcomes and graduate performance in alignment with institutional goals.

2.4.1 PEO 1: Practicing technician in electrical engineering-related field

The measurement of PEO 1 as illustrated in the flowchart in the Figure 2.1 is based on the responses to Item 1 until Item 3 as described below:

- Item 1: Are you working/have you ever worked in an electrical/electronic engineering related field ?
- Item 2: Have you ever applied/ practised any electrical/electronic knowledge in your job scope ?
- Item 3: Are you able to perform technical tasks in the field of electrical/electronic engineering effectively ?

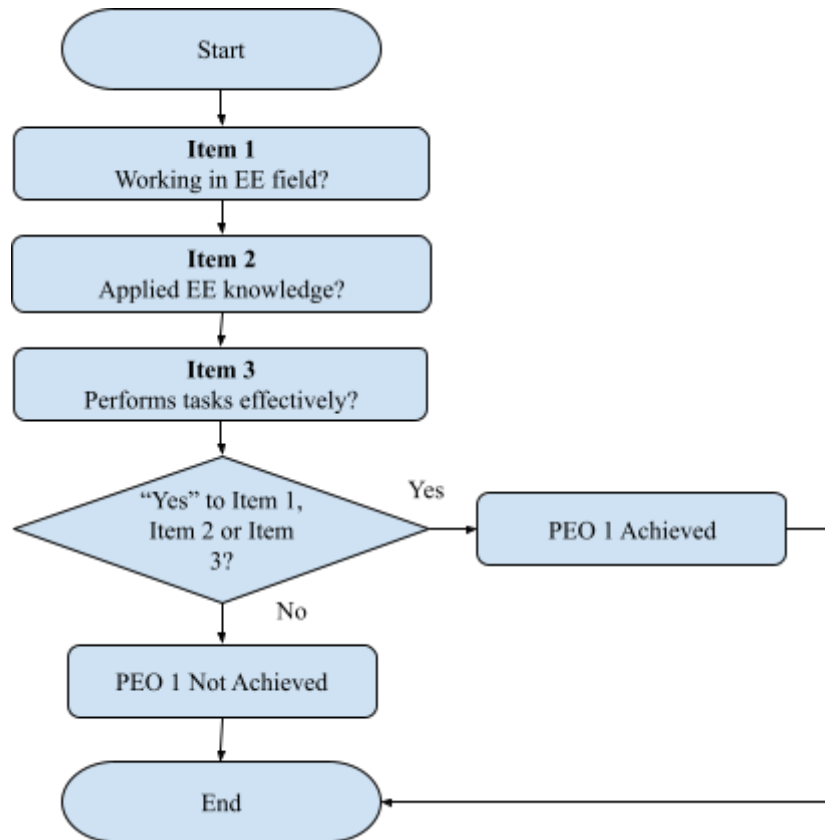


Figure 2.1: Flowchart Measurement of PEO 1

The measurement of PEO 1 is based on responses to three items. Item 1 asks whether the respondent is currently employed or has previously worked in a field related to electrical or electronic engineering. Item 2 asks whether they apply electrical or electronic knowledge within their current job scope. Item 3 asks whether they are able to perform technical tasks in the field of electrical or electronic engineering effectively.

A graduate is considered to have achieved PEO 1 if they answer "Yes" to at least one of the three items. This OR-based logic ensures that graduates who may not be directly employed in an engineering role, but still utilise their technical knowledge in their work, are duly recognised. For instance, as illustrated in Table 2.2, a respondent who answered "No" to Item 1 but "Yes" to both Item 2 and Item 3 is still classified as having achieved PEO 1, reflecting the inclusive nature of this evaluation approach.

Table 2.2: Example Respondent Combination and PEO 1 outcome

Respondent	Item 1	Item 2	Item 3	PEO 1 Outcome
Respondent 1	Yes	Yes	Yes	Achieved
Respondent 2	Yes	No	No	Achieved
Respondent 3	No	Yes	No	Achieved
Respondent 4	No	Yes	Yes	Achieved
Respondent 5	No	No	Yes	Achieved
Respondent 6	No	No	No	Not Achieved

2.4.2 PEO 2: Contributing to society with professional ethic and responsibilities

The measurement of PEO 2 as illustrated in the flowchart in the Figure 2.2 is based on the responses to Item 1 until Item 3 as described below:

- Item 1: Are you practise ethical conduct and professional responsibility when working in a team at an educational institution or in the workplace?
- Item 2: Are you a member of any professional body or international society or regulatory body (e.g: BEM/ MBOT/ IEEE / IEM/ MySet/ CIDB/NIOSH)?
- Item 3: Have you ever involved in any community or social activities (e.g: communal work / Corporate Social Responsibility activities / social work / NGOs)?

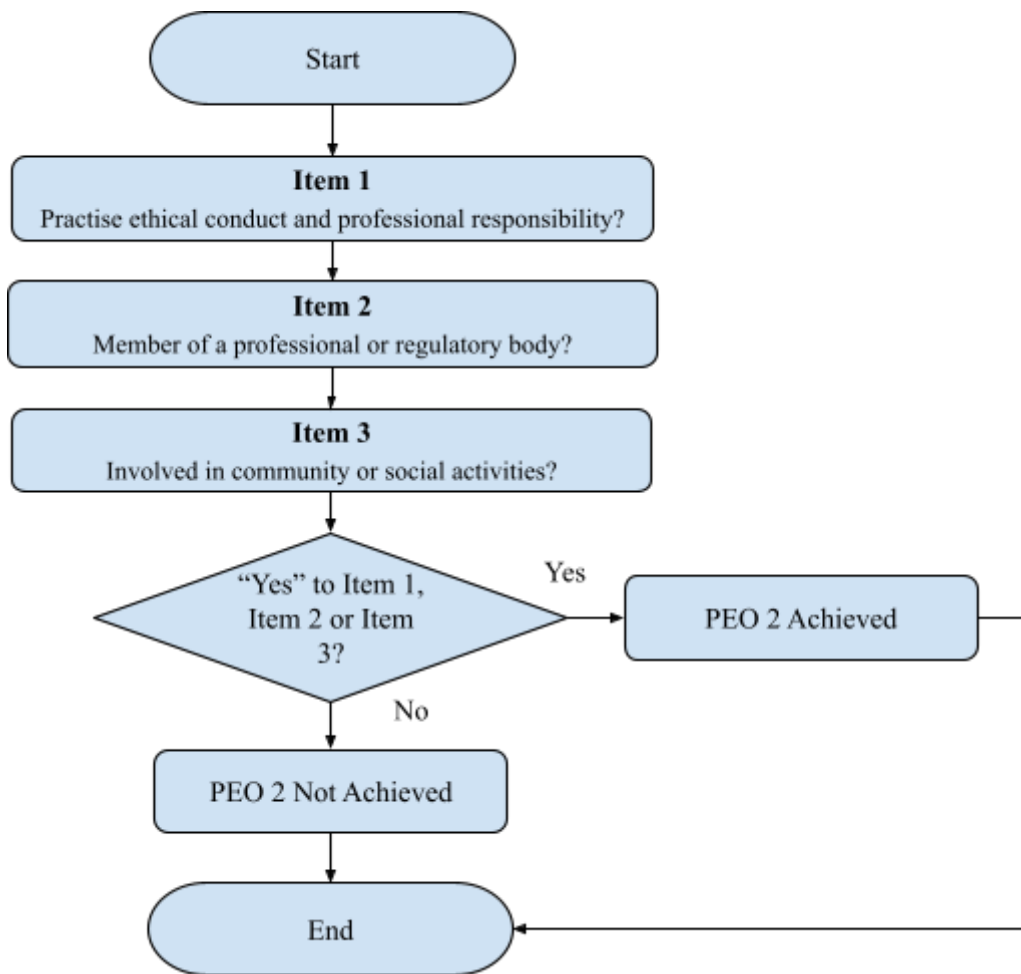


Figure 2.2: Flowchart Measurement of PEO 2

The measurement of PEO 2, which evaluates the role of graduates in their professional and societal contributions, is based on responses to three different items. A graduate is considered to have achieved PEO 2 if they answer "Yes" to at least one of the three items. Each item represents a different dimension of graduate involvement including ethical practices (Item 1), professional membership (Item 2) and participation in community or social activities (Item 3).

Table 2.3: Example Respondent Combination and PEO 2 outcome

Respondent	Item 1	Item 2	Item 3	PEO 2 Outcome
Respondent 1	Yes	Yes	Yes	Achieved
Respondent 2	Yes	No	No	Achieved
Respondent 3	No	Yes	No	Achieved
Respondent 4	No	Yes	Yes	Achieved
Respondent 5	No	No	Yes	Achieved
Respondent 6	No	No	No	Not Achieved

The example Table 2.3 illustrates how different combinations of responses determine the outcome. For instance, Respondent 1 is counted under PEO 2 for answering “Yes” to all items, while Respondent 2 meets the criteria through “Yes” responses to Items 1 only. In contrast, Respondent 6, who answered “No” to all items, does not meet PEO 2 outcome achieved. This comprehensive approach ensures a broader assessment of graduate contributions beyond technical work, capturing elements of professionalism, ethics, leadership, and community involvement.

2.4.3 PEO 3: Engaging in enterprising activities that apply engineering knowledge and technical skills

The measurement of PEO 3, which focuses on graduates’ involvement in entrepreneurship, R&D, is based on responses to three key items, namely Item 1, Item 2, and Item 3 as described below:

- Item 1: Have you ever engaged in entrepreneurship activities in the field of electrical / electronic engineering, either full-time or part-time, online or offline?
- Item 2: Have you ever involved in research and development (R&D) of any product/service/system/technical project? (e.g. market research, product quality improvement, business innovation, process improvement, design)
- Item 3: Have you ever participated in seminars, conferences, workshops, or competitions promoting entrepreneurship/ research and development (R&D)/ innovation in the field of electrical / electronic engineering?

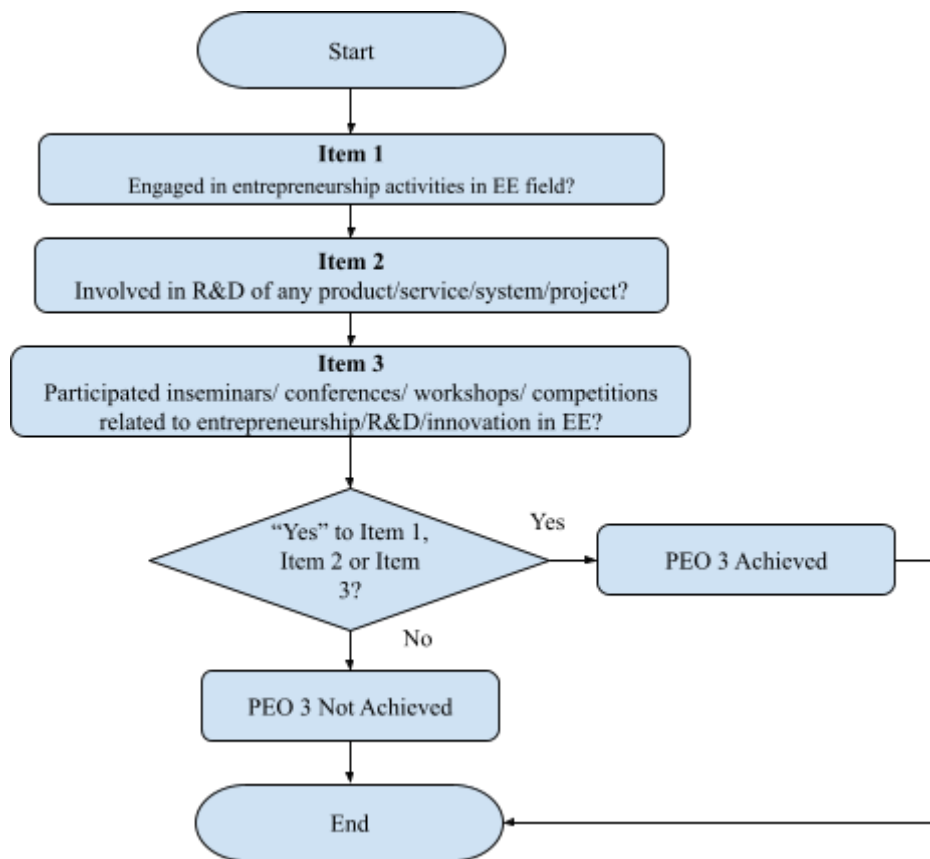


Figure 2.3: Flowchart Measurement of PEO 3

The measurement of PEO 3 is based on responses to three items. Item 1 asks whether the respondent is involved in any form of entrepreneurship activities in the field, either online or offline. Item 2 asks whether they are ever involved in R&D of any product/ service/ system/ project? Item 3 asks whether they participated in seminars/ conferences/ workshops/ competitions related to entrepreneurship, R&D or innovation in the EE field.

A graduate is considered to have achieved PEO 3 if they answer "Yes" to at least one of the three items. The decision logic is clearly shown in the flowchart in Figure 2.3, and the summary Table 2.4 at the bottom provides examples: Respondent 1 is counted achieved under PEO 3 by meeting all criteria, while Respondent 2 qualifies through Engaged in entrepreneurship activities in EE field (Item 1). Respondent 6 , who does not meet any path, is not counted as achieved. This structured approach ensures that graduates’ entrepreneurial and research contributions are accurately recognized whether through business ventures or innovation-driven activities.

Table 2.4: Example Respondent Combination and PEO 3 outcome

Respondent	Item 1	Item 2	Item 3	PEO 3 Outcome
Respondent 1	Yes	Yes	Yes	Achieved
Respondent 2	Yes	No	No	Achieved
Respondent 3	No	Yes	No	Achieved
Respondent 4	No	Yes	Yes	Achieved
Respondent 5	No	No	Yes	Achieved
Respondent 6	No	No	No	Not Achieved

2.4.4 PEO 4: Engaging in activities to enhance knowledge for successful career advancement

Figure 2.4 illustrates the measurement flowchart for PEO 4, which focuses on graduates' engagement in knowledge enhancement and career advancement activities. The measurement of PEO 4 is assessed through three items, where Items 1 and 2 are dichotomous (Yes/No) questions, while Item 3 employs a multiple-response format allowing respondents to select all applicable options. The item is as described below:

Item 1: Have you ever participated in any courses or activities to enhance your knowledge of new technology?

Item 2: Do you hold any professional certification?

Item 3: What are your achievements to date? (*You can select more than one answer option:)

Item 1 asks whether the graduate has ever participated in any courses or activities aimed at enhancing their knowledge of new technology. This item is designed to capture the graduate's commitment to continuous learning and self-improvement beyond formal education, which is a key indicator of lifelong learning behaviour. Item 2 asks whether the graduate currently holds any professional certification. Professional certification serves as tangible evidence that a graduate has pursued and attained a recognised standard of competency in their field, reflecting their commitment to professional development. Item 3 asks graduates to identify their achievements to date by selecting all applicable options from the following: salary increase, promotion, own business, further education, and not applicable. A multiple-response format is adopted for this item because graduate achievements are not mutually exclusive — a respondent may have simultaneously received a promotion and

pursued further education. Restricting the response to a single choice would underrepresent the breadth of graduate accomplishments.

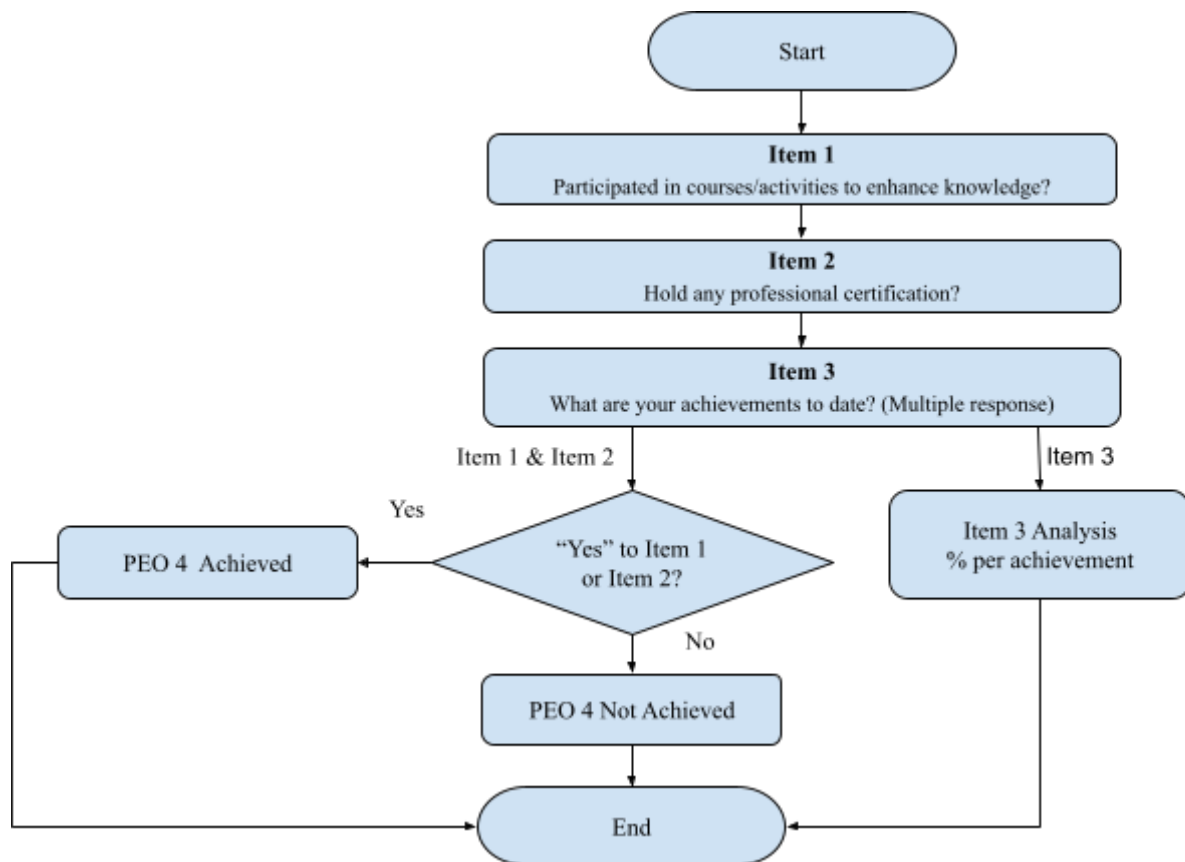


Figure 2.4: Flowchart Measurement of PEO 4

For Items 1 and 2, an OR-based decision rule is applied. A graduate is considered to have achieved PEO 4 if they respond "Yes" to either Item 1 or Item 2, or both. This approach acknowledges that graduates may demonstrate lifelong learning through different pathways — some through active participation in training and upskilling activities, and others through the attainment of formal professional certifications. Requiring both conditions to be met simultaneously would be overly restrictive and may exclude graduates who are genuinely committed to continuous professional development through one of these two legitimate pathways.

An example in Table 2.5 shows how responses are interpreted: if a graduate answers "Yes" to Item 1 but "No" to Item 2, they are still considered to have achieved PEO 4. This structure ensures that any valid form of engagement in professional or academic development is recognized as fulfilling the objective of continuous improvement and career growth.

Table 2.5: Example Respondent Combination and PEO 4 outcome

Respondent	Item 1	Item 2	PEO 4 Outcome
Respondent 1	Yes	Yes	Achieved
Respondent 2	Yes	No	Achieved
Respondent 3	No	Yes	Achieved
Respondent 4	No	No	Not Achieved

For Item 3, since respondents may select more than one option, the data is analysed by calculating the response percentage for each option independently. Each option is treated as a separate binary variable, and its frequency is expressed as a percentage of the total number of respondents. The formula applied is:

$$\text{Percentage for each option (\%)} = (\text{Number of respondents who selected the option} \div \text{Total number of respondents}) \times 100$$

Note that the sum of percentages across all options will exceed 100% due to the multiple-response nature of the item. This is expected and acceptable in multiple-response analysis. Results are reported individually for each category — salary increase, promotion, own business, further education, and not applicable — to provide a comprehensive profile of graduate achievements.

3.0 RESULTS AND ANALYSIS

This PEO review analysis was developed based on two sources of data. The first source comprises questionnaire responses collected from graduates of the Electrical Engineering Department who completed their studies in the 2021 cohort. The second source consists of interview findings obtained from industry advisers appointed by the department for each programme. Together, these two data sources provide a comprehensive basis for evaluating and reviewing the achievement of the Programme Educational Objectives.

3.1 Analysis of PEO of Questionnaire Method

For the DEP program, a total of 90 graduates were recorded from the 2021 cohort, based on data obtained from the Sistem Pengurusan Maklumat Politeknik (SPMP), Politeknik Port Dickson. Out of these, 90 alumni responded to the PEO survey. This results in a response rate of 100%. As the target is to achieve a full 100% response rate, the DEP program meets the required respondent percentage. Additionally, Table 3.1 presents the overall distribution of respondents by gender for DEP programs.

Table 3. 1: Total respondents by gender

Programme	Male	Female	Total respondent	Total graduates	Percentage of Respondents (%)
DEP	48	42	90	90	100.0%

Source of graduates: SPMP, Politeknik Port Dickson

3.1.1 PEO 1: Practicing Technician in Electrical Engineering-Related Field

PEO 1 represents graduates working as practicing technicians in electrical and/or electronic engineering fields, which is a key measure of the program's effectiveness. Table 3.2 presents the response distribution for each of the three items used to measure PEO 1. The findings are as follows:

- Item 1 :Worked in electrical/electronic engineering field: 61 respondents (68%) answered "Yes", while 29 respondents (32%) answered "No". This indicates that approximately two-thirds of graduates are directly employed in the electrical or electronic engineering field.
- Item 2 :Applied electrical/electronic knowledge: 78 respondents (87%) answered "Yes", while 12 respondents (13%) answered "No". This suggests that a large majority of graduates actively apply their technical knowledge in their current work scope, regardless of whether they are directly employed in the engineering field.
- Item 3 :Performed technical tasks in the field: 85 respondents (94%) answered "Yes", while only 5 respondents (6%) answered "No". This is the highest achievement rate among the three items, indicating that most graduates are capable of performing technical tasks effectively in their respective roles.

Table 3. 2: Percentage achievement of by element in PEO 1

PEO 1	Item/ Element	Achievement			
		Yes	%	No	%
Practicing technician in electrical engineering related field	Worked in electrical/electronic engineering field	61	68%	29	32%
	Applied electrical/electronic knowledge	78	87%	12	13%
	Performed technical tasks in the field	85	94%	5	6%

Based on Table 3.3 a graduate is classified as having achieved PEO 1 if they answered "Yes" to at least one of the three items. Out of 90 respondents, 87 graduates (97%) were classified as having achieved PEO 1, while only 3 graduates (3%) were classified as not having achieved PEO 1, having answered "No" to all three items. This is clearly illustrated in the pie chart, which shows 97% working in the field against 3% not working in the field.

The overall PEO 1 achievement rate of **97%** comfortably exceeds the Key Performance Indicator (KPI) target of more than 50% for the 2021 cohort, demonstrating that the

programme has successfully produced graduates who are practising as technicians in the electrical engineering related field.

Table 3. 3: Percentage achievement of PEO 1

PEO 1	KPI 2021 Cohort	Analysis PEO 1	Respondent	Achievement (%)
Practicing technician in electrical engineering related field	>50%	Working in field	87	97%
		Not working in field	3	3%

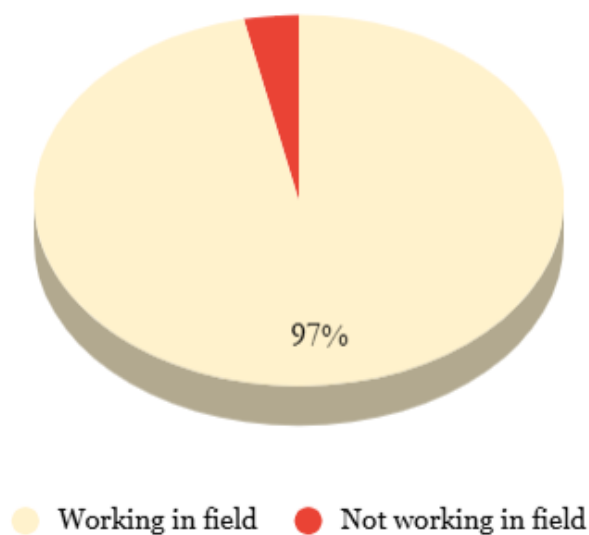


Figure 3. 1: Percentage achievement of PEO 1

3.1.2 PEO 2: Contributing to society with professional ethics and responsibilities

PEO 2 represents graduates who contribute to society with professional ethics and responsibilities, reflecting the programme's commitment to producing graduates who are not only technically competent but also ethically grounded and socially responsible. Table 3.4 presents the response distribution for each of the three items used to measure PEO 2. The findings are as follows:

- Item 1 : Ethical teamwork & professional responsibility: 89 respondents (99%) answered "Yes", while only 1 respondent (1%) answered "No". This indicates that almost all graduates practise ethical conduct and professional responsibility in their workplace or educational setting, reflecting a strong ethical foundation instilled by the programme.
- Item 2 : Professional membership: 36 respondents (40%) answered "Yes", while 54 respondents (60%) answered "No". This suggests that while a portion of graduates have joined professional or regulatory bodies such as BEM, IEM, or IEEE, the majority have yet to attain formal professional membership, which may reflect the early stage of their careers.
- Item 3 : Community & social involvement: 45 respondents (50%) answered "Yes", while 45 respondents (50%) answered "No". This indicates an equal split among graduates in terms of participation in community or social activities, suggesting that involvement in such activities is moderate among the 2021 cohort.

Table 3.4: Percentage achievement by element in PEO 2

PEO 2	Element	Achievement			
		Yes	%	No	%
Contributing to society with professional ethic and responsibilities	Ethical teamwork & professional responsibility	89	99%	1	1%
	Professional membership	36	40%	54	60%
	Community & social involvement	45	50%	45	50%

Based on Table 3.5, a graduate is classified as having achieved PEO 2 if they answered "Yes" to at least one of the three items. Out of 90 respondents, 89 graduates (99%) were classified as having achieved PEO 2, while only 1 graduate (1%) was classified as not having achieved PEO 2, having answered "No" to all three items. This is clearly illustrated in the pie chart, which shows 99% contributing to society against 1% not achieved.

The overall PEO 2 achievement rate of 99% comfortably exceeds the Key Performance Indicator (KPI) target of more than 65% for the 2021 cohort, demonstrating that the programme has successfully produced graduates who contribute to society with professional ethics and responsibilities.

Table 3.5: Percentage achievement of PEO 2

PEO 2	KPI 2021 Cohort	Analysis PEO 2	Respondent	Achievement (%)
Contributing to society with professional ethic and responsibilities	>65%	Contributing to society with professional ethic and responsibilities	89	99%
		Not involved and not contributed to society	1	1%



Figure 3.2: Percentage achievement of PEO 2

3.1.3 PEO 3: Engaging in enterprising activities that apply engineering knowledge and technical skills

PEO 3 represents graduates who engage in enterprising activities that apply engineering knowledge and technical skills, reflecting the programme's aspiration to nurture graduates with an entrepreneurial and innovative mindset. Table 3.6 presents the response distribution for each of the three items used to measure PEO 3. The findings are as follows:

- Item 1 : Engaged in electrical/electronic engineering entrepreneurship: 19 respondents (21%) answered "Yes", while 71 respondents (79%) answered "No". This indicates that only a small proportion of graduates have ventured into entrepreneurship in the electrical or electronic engineering field, which may reflect the relatively early career stage of the 2021 cohort.
- Item 2 :Involved in R&D of products, services, or systems: 16 respondents (18%) answered "Yes", while 74 respondents (82%) answered "No". This is the lowest achievement rate among the three items, suggesting that direct involvement in research and development activities remains limited among graduates at this stage.
- Item 3 :Participated in seminars, workshops, conferences, or competitions on entrepreneurship, R&D, or innovation: 23 respondents (26%) answered "Yes", while 67 respondents (74%) answered "No". This is the highest achievement rate among the three items, indicating that participation in knowledge-sharing and competitive platforms is relatively more common than direct entrepreneurship or R&D involvement.

Table 3.6: Percentage achievement by element in PEO 3

PEO 3	Element	Achievement			
		Yes	%	No	%
Engaging in enterprising activities that apply engineering knowledge and technical skills	Engaged in electrical/electronic engineering entrepreneurship	19	21%	71	79%
	Involved in R&D of products, services, or systems	16	18%	74	82%
	Participated in seminars, workshops, conferences, or competitions on entrepreneurship, R&D, or innovation	23	26%	67	74%

Based on Table 3.7, a graduate is classified as having achieved PEO 3 if they answered "Yes" to at least one of the three items. Out of 90 respondents, 38 graduates (42%) were classified as having achieved PEO 3, while 52 graduates (58%) were classified as not having achieved PEO 3, having answered "No" to all three items. This is clearly illustrated in the pie chart, which shows 42% involved in enterprising activities against 58% not involved.

The overall PEO 3 achievement rate of 42% exceeds the KPI target of more than 40% for the 2021 cohort, demonstrating that the programme has met its minimum benchmark in producing graduates who engage in enterprising activities that apply engineering knowledge and technical skills. However, the relatively narrow margin above the KPI threshold suggests that there is room for improvement, particularly in encouraging greater graduate involvement in entrepreneurship and R&D activities.

Table 3.7: Percentage achievement of PEO 3

PEO 3	KPI 2021 Cohort	Analysis PEO 3	Respondent	Achievement (%)
Engaging in enterprising activities that apply engineering knowledge and technical skills	>40%	Involved in Enterprising Activities, Research and Development	38	42%
		Not involved and contributed to society	52	58%

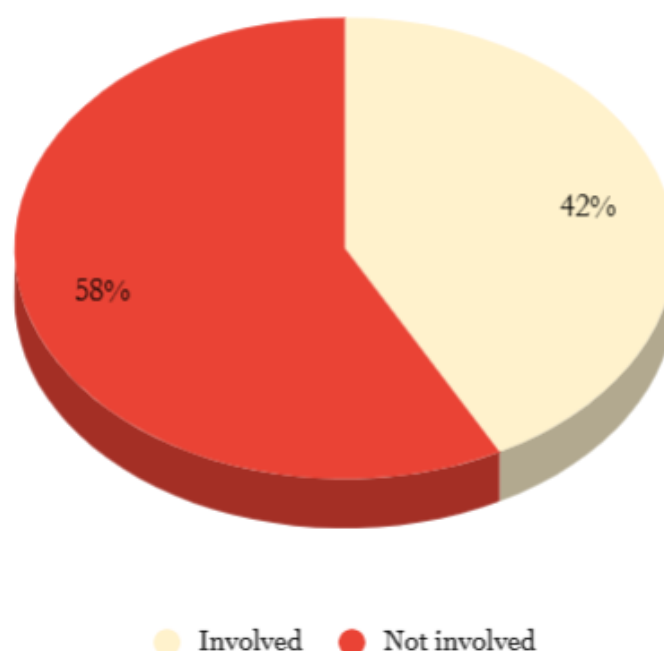


Figure 3.3: Percentage achievement of PEO 3

3.1.4 PEO 4: Engaging in activities to enhance knowledge for successful career advancement

PEO 4 represents graduates who engage in activities to enhance their knowledge for successful career advancement, reflecting the programme's commitment to nurturing a culture of lifelong learning and continuous professional development. Table 3.8 presents the response distribution for the items used to measure PEO 4. The findings are as follows:

- Item 1 : Participation in technology upskilling activities: 46 respondents (51%) answered "Yes", while 44 respondents (49%) answered "No". This indicates that slightly more than half of graduates have actively participated in courses or activities to enhance their knowledge of new technology, reflecting a moderate level of engagement in lifelong learning.
- Item 2 : Professional certification status: 30 respondents (33%) answered "Yes", while 60 respondents (67%) answered "No". This suggests that approximately one-third of graduates have attained a professional certification, indicating that formal recognition of competency is still developing among the 2021 cohort at this stage of their careers.

Table 3.8: Percentage achievement by element in PEO 4

PEO 4	Item/ Element	Achievement			
		Yes	%	No	%
Engaging in activities to enhance knowledge for successful career advancement	Participation in technology upskilling activities	46	51%	44	49%
	Professional certification status	30	33%	60	67%

In addition to Items 1 and 2, Table 3.9 captures the self-reported achievements of graduates through a multiple-response question. The distribution of responses is as follows: 52 respondents (58%) reported a salary increase, 22 respondents (24%) reported a promotion, 5 respondents (6%) reported establishing their own business, 23 respondents (26%) reported pursuing further education, 17 respondents (19%) selected not applicable, and no respondents selected other. As this is a multiple-response item, the percentages do not sum to 100% as respondents were permitted to select more than one option. Salary increase is the most frequently reported achievement, indicating that a majority of graduates have progressed in terms of remuneration since completing their studies.

Table 3.9: Percentage self-reported achievements of graduates

Achievements to date	No. of Respondent	
	Yes	Achievement%
Salary increase	52	58%
Promotion	22	24%
Own business	5	6%
Further education	23	26%
Not applicable	17	19%
Other:	0	0%

Based on Table 3.10, a graduate is classified as having achieved PEO 4 if they answered "Yes" to at least one of Items 1 or 2. Out of 90 respondents, 51 graduates (57%) were classified as having achieved PEO 4, while 39 graduates (43%) were classified as not having achieved PEO 4, having answered "No" to both items. This is clearly illustrated in the pie chart, which shows 57% involved against 43% not involved.

The overall PEO 4 achievement rate of 57% exceeds the KPI target of more than 45% for the 2021 cohort, demonstrating that the programme has successfully produced graduates who engage in activities to enhance their knowledge for successful career advancement.

Table 3.10: Percentage achievement of PEO 4

PEO 4	KPI 2021 Cohort	Analysis PEO 4	Respondent	Achievement (%)
Engaging in activities to enhance knowledge for successful career advancement	>45%	Involvement in activities to enhance knowledge for successful career advancement.	51	57%
		Not involved	39	43%

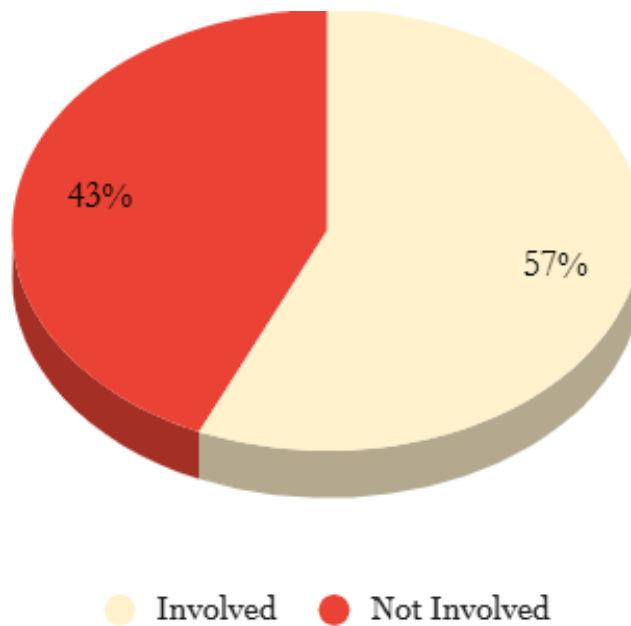


Figure 3.4: Percentage achievement of PEO 4

3.1.5 Summary

The overall analysis of the PEO achievement for the DEP programme graduates of the 2021 cohort demonstrates highly encouraging results, as presented in Table 3.11. For PEO 1, 97% of graduates are either working directly in the electrical or electronic engineering field or applying related technical knowledge in their job scope, indicating a strong alignment between the programme curriculum and industry requirements.

For PEO 2, 99% of respondents demonstrated active involvement in ethical teamwork, professional responsibility, professional membership, or community and social activities, reflecting an exceptionally high level of professional ethics and social responsibility among graduates.

Regarding PEO 3, 42% of graduates are engaged in enterprising activities, research and development, or innovation-related events in the electrical or electronic engineering field, meeting the KPI threshold and reflecting a satisfactory level of entrepreneurial and innovative initiative among the 2021 cohort.

For PEO 4, 57% of graduates have engaged in activities to enhance their knowledge for career advancement, either through technology upskilling or attainment of professional certification, exceeding the KPI target and highlighting the programme's positive influence on the long-term professional development of its graduates.

Collectively, these findings indicate that the DEP programme effectively meets its educational objectives by producing graduates who are technically competent, professionally responsible, innovative, and committed to continuous career advancement. All four PEOs have met or exceeded their respective KPIs for the 2021 cohort, as summarised in Table 3.11, reflecting the overall effectiveness and success of the DEP programme in fulfilling its educational mission.

Table 3.11: The overall achievement for DEP programme

PEO	KPI 2021 Cohort	Analysis PEO	DEP Achievement (%)		
			Respondent	Achievement (%)	Status
PEO 1: Practicing technician in electrical engineering related field	>50%	Working in field	87	97%	Achieved
		Not working in field	3	3%	
		TOTAL	90	100%	
PEO 2: Contributing to society with professional ethic and responsibilities	>65%	contributing to society with professional ethic and responsibilities	89	99%	Achieved
		Not involved and contributed to society	1	1%	
		TOTAL	90	100%	
PEO 3: Engaging in enterprising activities that apply engineering knowledge and technical skills	>40%	Involved in Enterprising Activities, Research and Development	38	42%	Achieved
		Not involved and did not contributed to society	52	58%	
		TOTAL	90	100%	

PEO 4: Engaging in activities to enhance knowledge for successful career advancement	>45%	Involvement in activities to enhance knowledge for successful career advancement.	51	57%	Achieved
		Not involved	39	43%	
		TOTAL	90	100%	

3.2 Analysis of Respondent Interview Protocol Method

A presentation session on the findings of the PEO achievement for the 2021 cohort was conducted online on 05 May 2026. Four stakeholders representing the DEP programme, comprising members of the IAP and alumni, attended the session. All participants possess extensive professional experience in industries and technical fields relevant to the DEP programme.

This study is part of an initiative to support the Department of Electrical Engineering (DEE) in strengthening the programme and ensuring that the field of study offered at polytechnics remains aligned with current industry demands. Accordingly, the study examined stakeholders' perspectives and feedback regarding the achievement of the PEOs for the DEP programme. The respondents' profiles, based on input from key stakeholders such as the IAP and alumni, are presented in Table 3.12. The feedback collected during the session has been instrumental in identifying programme strengths, areas for improvement and strategic actions to enhance the relevance and effectiveness of the DEP programme in fulfilling industry expectations.

Table 3.12: Stakeholders Respondent Profiles

Respondents	Category	Name	Position & Organization	Year of Experience
Respondent 1	IAP	Mohamed Shajahan Bin Mohd Iqbal	Chief Executive Officer (CEO), 3OPP (M) Sdn. Bhd.	35 years

Respondent 2	IAP	En. Mohamed Firdaus Bin Mohamed Shah	Director, Jana Atur Sdn. Bhd.,	22 years
Respondent 3	alumni	Ir. Ts. Muhammad Izat Fikri Bin Wahab	Project, Facilities Operation & Maintenance, Malaysia Airlines Berhad Engineering Services	11 years
Respondent 4	alumni	Tc. Muhammad Iqbal Bin Abdul Halip	Project Director, KS IT Solutions Sdn. Bhd.	6 years

To achieve the objectives of this study, an analysis of the PEO achievement data was carried out, complemented by interviews with the IAP and alumni of the DEP programme. These interviews aimed to gather insights for improving the attainment of the PEO. The findings from the interviews are organised into several sections, each corresponding to a specific PEO. The PEOs were assessed through a questionnaire distributed to graduates of the 2021 cohort. This evaluation was conducted five years after graduation in accordance with the standard timeframe for PEO assessment.

All respondents participated in the PEO presentation session. All respondents generally agreed with the findings presented and acknowledged that the analysis accurately reflected the current performance of the DEP programme. Although all respondents agreed with the findings presented, detailed recommendations were primarily provided by Respondent 4 through the discussion session and the Google Form feedback.

3.2.1 Stakeholders Feedback on PEO 1

For PEO1, feedback from alumni and industry representatives indicates that graduates of the DEP Programme have successfully secured employment in fields related to their area of study. Graduates are also perceived to possess technical competencies and practical skills that meet current industry requirements. In addition, industry representatives acknowledged the strengths of DEP graduates in

terms of hands-on skills, technical task execution, and their ability to adapt to real working environments. This can be evidenced through the following feedback excerpt:

... berkaitan dengan PEO1 ni, saya rasa okeylah sebab saya sendiri pun memang kerja dalam bidanglah setakat ni, daripada saya Diploma Komunikasi pun di Poli PD...
(Respondent 4)

This excerpt indicates that DEP graduates have successfully obtained employment directly related to their field of study. The situation demonstrates that the objective of PEO1 has been achieved as graduates can function as technical workforce personnel in industries related to electronics and telecommunications. The real working experience shared by alumni in relevant industries also reflects the good employability of DEP graduates.

Furthermore, the industry also provided positive feedback regarding the technical capabilities of DEP graduates as follows:

... Setakat ni pun kalau saya interview dengan student-student daripada Poli PD pun memang saya gembiralah kalau nak ambil mereka sebab salah satunya saya nampak sebab dia orang ni hands-on banyak. So senang untuk kita bila dia masuk, senang nak bagi arahan dan juga tak perlu banyak kita perlu latihan pada dia... (Respondent 4)

This feedback shows that DEP graduates possess strong practical or hands-on skills, which are highly important in the technical industry. Graduates are seen as being able to quickly understand operational tasks and require minimal training upon entering the workforce. This demonstrates that the practice-based learning approach implemented in the DEP programme has successfully fulfilled current industry needs.

In addition, the respondent also stated that the programme implemented is relevant to industry requirements:

...secara keseluruhannya, program yang dilaksanakan adalah relevan dan selari dengan keperluan industri, khususnya dalam melahirkan graduan yang kompeten dari aspek teknikal dan aplikasi praktikal. Pihak institusi disaran untuk terus memperkukuh elemen pendedahan industri, teknologi semasa serta kemahiran komunikasi profesional bagi memastikan graduan

kekal berdaya saing dan memenuhi keperluan pasaran kerja yang sentiasa berkembang...
(Respondent 4)

This excerpt illustrates that the DEP curriculum is on the right track in producing graduates who are technically and practically competent. Nevertheless, the industry also suggested that elements related to current technologies, industrial exposure, and professional communication should continue to be strengthened to ensure graduates remain relevant and competitive.

Overall, the findings for PEO1 indicate that DEP graduates have successfully achieved the programme objective as technical workforce personnel in electronics and telecommunications-related fields. Graduates are recognised for having good hands-on skills, relevant technical competencies, and the ability to adapt to industry requirements. However, the institution is encouraged to continuously strengthen exposure to current technologies, professional communication, and industry collaboration through CQI initiatives to ensure graduates remain competitive in future industrial environments.

3.2.2 Stakeholders Feedback on PEO 2

Based on stakeholders' feedback, DEP graduates were found to demonstrate a commendable level of professional ethics and the ability to collaborate effectively within a team environment. In addition to possessing strong technical competencies, the graduates also exhibited awareness of social responsibility through their involvement in community engagement programmes and Corporate Social Responsibility (CSR) initiatives. These findings indicate that the DEP programme has successfully produced graduates who are not only technically competent, but also equipped with professional values, interpersonal skills, and a strong sense of responsibility towards society.

This can be observed through the following feedback:

...secara umum, graduan menunjukkan tahap etika profesional yang baik serta mampu bekerjasama dalam pasukan dengan efektif. namun, penambahbaikan berterusan disaran khususnya dalam aspek komunikasi profesional agar lebih yakin, jelas dan bersesuaian dengan persekitaran industri.... (Respondent 4)

This statement indicates that DEP graduates possess positive professional attitudes and can work effectively in teams. Interpersonal and teamwork skills are highly valued in the industry, as most technical tasks require cross-functional collaboration and effective communication among departments.

Furthermore, the respondent also highlighted the graduates' involvement in CSR-related activities as follows:

...organisasi kami terlibat dalam pelaksanaan program tanggungjawab sosial korporat (CSR). Kami juga bekerjasama dengan agensi kerajaan dalam menjayakan pelbagai inisiatif CSR. Penglibatan graduan adalah melalui penyertaan dalam program-program tersebut, termasuk memberi sokongan teknikal dan membantu pelaksanaan aktiviti bersama komuniti... (Respondent 4)

This feedback demonstrates that the graduates actively contribute to society through participation in community engagement activities and CSR programmes. Such involvement reflects their social awareness and ability to apply technical knowledge and skills in supporting local communities. Nevertheless, the industry also suggested that professional communication skills should continue to be strengthened to enhance graduates' confidence and readiness in adapting to real industrial working environments.

Overall, PEO2 was found to be successfully achieved as the graduates demonstrated good professional ethics, effective teamwork abilities, and active participation in community and CSR-related activities. However, professional communication skills still require further enhancement to improve graduates' confidence, professionalism, and effectiveness within the industrial environment.

3.2.3 Stakeholders Feedback on PEO 3

Feedback from alumni and industry stakeholders indicates that the entrepreneurship elements embedded within the DEP programme are recognised as valuable in developing graduates who are competitive, adaptable, and capable of creating additional career opportunities beyond conventional employment. Nevertheless, stakeholders emphasised that graduates require greater exposure to entrepreneurship opportunities related to telecommunications,

electronics, IT, and emerging digital technologies to better understand the career potential within their field of specialisation.

This was highlighted by the respondent as follows:

...berkaitan dengan PEO 3 ni pandangan sayalah sebab saya dah jadi alumni ni. Sebenarnya daripada segi aktiviti keusahawanan tu inisiatif yang bagus daripada segi poli lah untuk buat ke bidang apa ada subjek ni... (Respondent 4)

This statement indicates that the institution's effort in integrating entrepreneurial elements into the programme is viewed positively by stakeholders. Such an approach contributes towards producing graduates who are not solely dependent on employment opportunities but are also capable of creating their own economic and business opportunities.

However, the respondent further suggested that entrepreneurial exposure should be more closely aligned with the students' field of specialization:

...cuma kat sini kalau contoh mereka ni dapat kesedaran tu daripada segi bidang mereka, macam contoh DEP (Diploma Kejuruteraan Elektrik Perhubungan) lah, telekomunikasi. So kalau contoh mereka dapat buat apa-apa berkaitan yang melibatkan aktiviti keusahawanan yang elektronik ke atau apa-apa yang berkaitan dengan telekomunikasi, is much better lah... (Respondent 4)

This feedback demonstrates that entrepreneurship activities directly related to telecommunications, networking, electronics, fibre optics, IT services, and digital technologies would provide greater relevance to DEP graduates.

In addition, the respondent shared concerns regarding the lack of career direction awareness among graduates upon completion of their studies:

... sebab saya sendiri pun masa selepas saya keluar daripada, maksudnya selepas graduate, memang saya tak nampak direction sebab salah satunya tak nampak maksudnya kesedaran tahu bila DEP ni sebenarnya kerja dalam bidang apa. Kita bila sebut macam contoh DEP ni lah, saya ambil diploma perhubungan. Saya dulu daripada dulu saya ingat macam, oh kerja

kedai telefon kot? Tapi bila dah kerja dalam bidang, sebenarnya telekomunikasi ni dia meluas. Dia banyak kepada IT, dia banyak kepada telco, internet provider dan juga data center... (Respondent 4)

The excerpt reflects that some graduates are still uncertain about the actual career opportunities available within the DEP field. This situation highlights the need for enhanced career exposure and industry awareness initiatives to be introduced earlier during the students' academic journey. In response to this issue, the respondent recommended that the institution strengthen its collaboration with industry partners:

... jadi kat sini yang saya nampak, antara orang kata macam R&D ataupun aktiviti-aktiviti yang boleh beri kesedaran kepada graduan ini sendiri sebenarnya Poli PD boleh membuat kolaborasi dengan industri sendiri untuk memberikan macam ceramah ke apa-apa untuk sedarkan mereka pasal bidang-bidang ni... (Respondent 4)

In addition, the respondent emphasized that career exposure initiatives should be expanded across all fields of study to help graduates gain clearer direction regarding career opportunities after graduation:

... saya tak cakap pasal DEP lah, mungkin semua keseluruhan lah. Mungkin jemput beberapa bidang kerja yang ada ni. So sekurang-kurangnya bagi mereka kesedaran. Sebenarnya sebab bila mereka dah keluar ni, kadang-kadang mereka ni tak ada orang kata guidance tahu, nak bekerja dalam apa, nak kerja sebagai apa dan sebagainya. Jadi mereka ada yang mempunyai inisiatif sendirilah untuk buat research... (Respondent 4)

The respondent further explained that the culture of research and awareness of industry developments should be nurtured earlier among students:

... tapi betullah, daripada segi R&D atau research ni kalau daripada segi graduan Poli PD ni dia kurang sikit sebab benda tu kita tak cuba amalkan daripada awal. Tapi kalau boleh diperbaiki daripada segi mungkin kita beri kesedaran kepada graduan bahawa macam mana industri ni works dan perkembangan industri apa teknologi terbaru, kadang-kadang mereka mungkin lebih minat... (Respondent 4)

Another important issue highlighted by the respondent expressed the view that continuous support and exposure from the institution are essential in helping graduates understand the actual working environment and industry expectations:

...kita kena bagi orang kata support lah daripada mereka supaya memahami macam mana industri ni sebenarnya bekerja. Itu pandangan sayalah... (Respondent 4)

The respondent also emphasised the rapid growth of data centre and AI-related industries:

...untuk DEP ni, program dia sebenarnya bagi saya tengah berkembang dalam masa 5 ke 10 tahun ni saya nampak memang orang kata industri memang akan ambillah DEP punya program, terutama dalam telekomunikasi. Tuan-tambah dalam industri sekarang, data center kalau dekat Johor memang tengah banyaklah, tengah tumbuh macam cendawan. Lepas tu kebanyakannya memang data center akan lebih kepada AI. So apa kaitan dengan telekomunikasi ni, walaupun nama telekomunikasi tapi dia pun secara langsung dia masuk dengan IT. Jadi bila kita lebih kepada IT ni, setakat ni sistem-sistem IT ni memang orang kata dia menaik memang menaik sangat-sangat lajulah... (Respondent 4)

This feedback demonstrates that the DEP programme is highly relevant to current and future industry demands, particularly within the rapidly expanding telecommunications, IT, data centre, and AI-related sectors. The respondent emphasized that the increasing growth of data centres, especially in Johor, presents significant employment opportunities for DEP graduates due to the strong integration between telecommunications and IT technologies.

In relation to this, the respondent further suggested that greater career awareness initiatives should be introduced to help students better understand the broad employment opportunities available within the DEP field:

...jadi kalau dapat sedarkan kepada pelajar-pelajar DEP ni supaya peluang pekerjaan mereka memang tengah banyak, dalam masa kemungkinanlah saya nampak dalam masa 2 ke 3 tahun ni memang akan ada lebih banyak peluang pekerjaan. Jadi kalau boleh dapat orang kata macam tadi lah buat forum khas untuk sedarkan mereka berkaitan dengan kerja-kerja bidang yang ada dekat luar ni, memang mereka akan interested sebab saya sendiri pun inisiatif dulu pun saya cari sendiri apa sebenarnya kerja-kerja dalam bidang DEP ni saya sendiri. Macam tu... (Respondent 4)

This statement indicates the importance of organising dedicated career forums, industrial talks, and awareness programmes to expose students to the actual career prospects available in the telecommunications and IT industries. Such initiatives could enhance students' understanding of industry demands, strengthen career motivation, and help graduates make more informed career decisions upon graduation.

Overall, the findings for PEO3 indicate a positive achievement, as graduates demonstrate strong potential in technical entrepreneurship and possess broad career opportunities within the telecommunications and IT industries. Nevertheless, the institution should further strengthen career awareness initiatives, industry collaboration, and exposure to emerging technologies to ensure that graduates are better informed about career pathways and entrepreneurial opportunities related to the DEP field.

3.2.4 Stakeholders Feedback on PEO 4

Feedback on PEO4 indicates that DEP graduates demonstrate a strong awareness of the importance of lifelong learning and continuous professional development. Graduates were found to actively enhance their competencies through professional certifications, involvement in professional organizations, further studies, and exposure to emerging technologies related to the telecommunications and IT industries. This situation reflects that graduates are motivated to continuously improve their level of professionalism and career advancement.

This can be observed through the following feedback:

...tapi untuk jadi certified technician, at least kena ada pengalaman kerja tiga tahun lah. Jadi bila once dah settle tiga tahun punya tempoh, dan saya apply lah. Aplikasi itu dia akan ada process flow lah, semua report, lepas tu interview semua tu... (Respondent 4)

This statement indicates that graduates understand the industry's requirements for professional certification and work experience in enhancing their credibility within technical careers.

In addition, the respondent also highlighted involvement in professional bodies:

...so benda ni sebenarnya bagi saya, saya ambil memang untuk orang kata nampak profesional lah saya dalam industri telco ni. Maksudnya saya bukan jual liur-liur basi lah, saya jual liur yang mahal kiranya. So, after that, saya pun ada juga buat research-research juga berkaitan dengan IEEE, BEM, dan salah satunya ada yang terbaru ni, tak ada lah baru sebenarnya... (Respondent 4)

...dia ada tapi jarang orang dengar lah, MTAM (Malaysian Technical Association Association). So ini pun is a good initiative lah. Setakat ni yang macam MTAM ni pun dia tak ada requirement yang strict sangat. Actually, budak diploma pun memang boleh apply lah. So at least kat sini supaya nampak profesional on that lah... (Respondent 4)

This feedback demonstrates that graduates are aware of the importance of expanding their knowledge and professional networking through engagement with professional bodies such as IEEE, the Board of Engineers Malaysia (BEM), and the Malaysian Technical Association (MTAM).

Furthermore, the respondent shared aspirations to further enhance professional recognition:

...after this maybe selepas saya dah habis saya punya degree part time ni, saya akan apply untuk Ts (Technologist) ke, Ir (Engineer) ke, atau yang lain-lain lah. So saya nampak kat sini kalau ikutkannya sepanjang tempoh lima tahun saya dah graduan ni memang memang ada lah jalan-jalan untuk dapatkan sijil-sijil profesional lah... (Respondent 4)

This excerpt illustrates that graduates possess clear career planning and a strong awareness of the importance of continuous academic and professional advancement.

Moreover, the respondent also emphasized that graduates have shown positive efforts in enhancing their skills:

...secara umum, graduan menunjukkan usaha yang baik dalam meningkatkan kemahiran serta mengikuti perkembangan teknologi baharu, selaras dengan keperluan industri yang sentiasa berubah. Kesedaran terhadap kepentingan pembelajaran berterusan dilihat semakin positif, namun ia perlu diperkukuh secara lebih konsisten. Khususnya dalam bidang

telekomunikasi, perkembangan teknologi yang pesat memerlukan graduan sentiasa peka dan proaktif dalam menambah baik kompetensi diri serta tahap profesionalisme. Inisiatif sendiri seperti mengikuti latihan, pensijilan dan pendedahan kepada teknologi semasa adalah penting bagi memastikan mereka kekal relevan dan berdaya saing dalam industri... (Respondent 4)

In addition, the respondent highlighted the growing opportunities available for graduates in technical and entrepreneurial fields:

...berdasarkan situasi industri dan ekonomi semasa, graduan mempunyai peluang yang baik untuk terlibat dalam aktiviti keusahawanan berkaitan bidang elektrik dan elektronik, sama ada secara sepenuh masa atau sambilan, terutamanya dalam perkhidmatan teknikal seperti rangkaian, fiber optik dan automasi yang kini semakin mendapat permintaan. Walau bagaimanapun, walaupun berasaskan kejuruteraan, graduan juga perlu dilengkapi dengan asas keusahawanan dan kefahaman perniagaan. Pendedahan kepada cara pasaran berfungsi adalah penting supaya mereka dapat mengenal pasti industri sasaran serta memilih syarikat yang bersesuaian. Sehubungan itu, institusi disaran untuk memperkukuh elemen keusahawanan dan pendedahan industri agar graduan lebih bersedia, berdaya saing dan mempunyai hala tuju kerjaya yang jelas.... (Respondent 4)

This feedback demonstrates that graduates recognise the importance of continuous learning, professional certification, and lifelong competency development in ensuring long-term employability within the rapidly evolving telecommunications and information technology industries.

Overall, PEO4 demonstrates positive achievement as graduates actively improve their competencies through professional certifications, further studies, and participation in professional organizations. Nevertheless, the institution is encouraged to further strengthen the culture of lifelong learning and exposure to professional certification pathways to ensure that graduates remain relevant and competitive within future industries.

3.2.5 Summary

In general, the input gathered from industry stakeholders and alumni indicates that the DEP programme has successfully achieved its intended PEOs and continues to produce graduates who are relevant to current industry needs. Stakeholders generally acknowledged that DEP graduates possess strong technical competencies, practical skills, professional ethics, teamwork abilities and adaptability to workplace requirements.

The findings further indicate that graduates actively contribute to society, demonstrate entrepreneurial awareness, and engage in lifelong learning and professional development activities. Stakeholders also recognised the relevance of the DEP programme in supporting workforce requirements within the telecommunications, information technology, and emerging technology sectors.

Despite these positive findings, stakeholders identified several areas for improvement. Professional communication skills should be further strengthened. Graduates should also be provided with greater exposure to emerging technologies. Industry engagement and career awareness initiatives should be enhanced. More emphasis should be placed on entrepreneurial knowledge. Participation in professional certification programmes should be encouraged. Continuous professional development activities should also be promoted.

Overall, the stakeholder feedback provides valuable input for the CQI process and supports the ongoing enhancement of the DEP programme to ensure that graduates remain competent, industry-ready, and capable of meeting future technological and professional challenges.

3.3 Proposed Continuous Quality Improvement

Based on the feedback provided by industry stakeholders and alumni, graduates of the DEP programme were found to possess strong technical and practical competencies that align with current industry requirements. Nevertheless, industry representatives identified several areas requiring further improvement to ensure that graduates remain relevant, competitive, and capable of meeting the evolving demands of the industry. The key areas identified include professional communication skills, self-confidence, exposure to current and emerging technologies, stronger industry collaboration, and greater emphasis on industry-based

learning approaches. This feedback serves as valuable input for the implementation of CQI initiatives to ensure that the curriculum and programme delivery continue to evolve in line with current industry needs.

This can be observed through the following feedback:

...graduan Politeknik mempunyai kekuatan dari segi kemahiran praktikal (hands-on) serta pengetahuan teknikal yang relevan dengan keperluan industri semasa. Mereka juga cepat menyesuaikan diri dan mampu melaksanakan tugas dengan baik di peringkat operasi. Secara keseluruhannya, graduan memenuhi keperluan asas industri. Cadangan: Institusi disaran untuk terus mengekalkan pendekatan pembelajaran berasaskan amali serta memperluas kolaborasi dengan industri bagi memastikan silibus sentiasa selari dengan keperluan semasa... (Respondent 4)

This statement indicates that Polytechnic graduates possess significant strengths in terms of practical skills and technical competencies that are relevant to industrial requirements. The graduates were also perceived as being adaptable and capable of performing operational tasks effectively within the workplace environment. This situation demonstrates that the practice-oriented learning approach implemented in the DEP programme has successfully produced graduates who meet the fundamental requirements of the industry. In addition, the industry representatives suggested that the institution should continue maintaining the practical-based learning approach while expanding collaboration with industry partners to ensure that the curriculum content remains relevant to current technological advancements.

However, the industry stakeholders also identified several competency gaps that require further improvement, as reflected in the following feedback:

... jurang utama adalah dari aspek komunikasi profesional, pendedahan kepada teknologi terkini serta kefahaman terhadap keperluan sebenar industri dan operasi perniagaan. Selain itu, keyakinan diri dan kemahiran berfikir secara kritikal masih boleh dipertingkatkan. Cadangan: Perlu ditambah elemen komunikasi profesional, pembentangan teknikal, serta pendedahan kepada teknologi semasa melalui latihan industri, pensijilan dan program bersama industri... (Respondent 4)

This feedback indicates that although the graduates possess strong technical competencies, there are still areas that require enhancement, particularly in professional communication, self-confidence, critical thinking, and understanding of actual industrial operations. These aspects are important as industries today not only require technically competent employees but also individuals who are able to communicate effectively, think critically and understand market demands as well as business operations. Therefore, the industry representatives recommended further strengthening graduates' professional communication skills. Technical presentation competencies should also be enhanced. Furthermore, exposure to current and emerging technologies should be increased through industrial training, professional certification programmes and industry collaboration activities.

Furthermore, the respondent also proposed several recommendations for curriculum enhancement:

...kurikulum sedia ada adalah baik namun boleh dipertingkatkan dengan penekanan kepada pembelajaran berasaskan projek industri sebenar, integrasi teknologi terkini serta elemen keusahawanan. Ini penting bagi memastikan graduan bukan sahaja kompeten secara teknikal tetapi juga memahami kehendak pasaran. Cadangan: Perlu diwujudkan lebih banyak "industry-driven projects", program pensijilan profesional serta modul keusahawanan dan pemahaman pasaran bagi meningkatkan kesiapsiagaan graduan... (Respondent 4)

The stakeholder feedback obtained for PEO 1 to PEO 4 provides valuable input for the CQI process. The identified strengths and areas for enhancement have been reviewed by the department, and the responsible units have been identified to facilitate the implementation of appropriate improvement initiatives. The summary of stakeholder feedback and the corresponding responsible units is presented in Table 3.13.

Table 3.13: Summary of Stakeholder Feedback and Responsible Units for CQI
Implementation

PEO	Stakeholder's Feedback	Stakeholder	Responsible Unit
PEO 1	Graduates demonstrated strong hands-on skills, technical competencies, and adaptability to industry requirements. However, enhancement in current technology exposure and professional communication is still required.	Respondent 4	DEE
PEO 2	Graduates exhibited good professional ethics, teamwork, and social responsibility through CSR and community involvement. Nevertheless, communication skills and self-confidence should be further strengthened.	Respondent 4	DEE
PEO 3	Graduates showed potential in entrepreneurship and broad career opportunities within telecommunications and IT industries. However, greater career awareness, industry exposure, and understanding of entrepreneurial opportunities are needed.	Respondent 4	DEE
PEO 4	Graduates demonstrated positive awareness towards lifelong learning, professional certifications, and career development. However, continuous professional development culture should be further reinforced.	Respondent 4	DEE
Overall	Industry stakeholders recommended improvements in professional communication, critical thinking, exposure to current technologies, industry-driven projects, entrepreneurship elements, and stronger	Respondent 4	DEE / UKE-BK

	industry collaboration to ensure curriculum relevance and graduate competitiveness.		
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3.4 Determination of PEO Achievement KPI for the 2022 Cohort

The determination of the final PEO achievement target percentages for the 2022 cohort was based on the analysis of the PEO achievement results for the 2021 cohort and three key references. First, the baseline recommendations provided by the Unit Kejuruteraan Elektrik (UKE), Bahagian Kurikulum (BK), were taken into consideration. Second, the proposed target percentages were discussed and refined through consultation with the IAP during the presentation of the PEO achievement analysis. Finally, the Programme Advisory Committee (PAC) reviewed the proposed targets and approved the final PEO achievement benchmarks for the 2022 cohort.

During the consultation session, the stakeholders expressed satisfaction with the overall achievement of the DEP PEOs in the first assessment cycle. They acknowledged that all four PEOs had achieved their respective targets and agreed that the proposed performance benchmarks were appropriate for monitoring future programme performance.

Based on the review and discussion of PEO achievement trends across the five engineering programmes, all respondents agreed that the overall performance patterns were comparable. After careful consideration of the recommendations and the achievement trends of the 2021 cohort, the DEE agreed to adopt the proposed KPI targets for the 2022 cohort, as presented in Table 3.14. These targets represent a collaborative and evidence-based approach to supporting CQI while ensuring that future PEO evaluations remain realistic, measurable, and aligned with stakeholder expectations.

Table 3.14: KPIs for PEO Achievement of the 2022 Cohort

PEO	Achievement (%)	
	Baseline UKE	Key Performance Indicator
PEO 1 Practicing Technician in Electrical Engineering Related Field	40	> 50
PEO 2 Contributing to society with professional ethics and responsibilities	40	> 65
PEO 3 Engaging in enterprising activities that apply engineering knowledge and technical skills	25	> 40
PEO 4 Engaging in activities to enhance knowledge for successful career advancement	40	> 45

4.0 DISCUSSION AND CONCLUSION

The review of PEOs for the DEP programme at Politeknik Port Dickson was conducted using two key methods: a questionnaire distributed to graduates of the 2021 cohort and structured interviews with members of the IAP and selected alumni. This analysis aimed to assess the extent to which the DEP programme has fulfilled its educational goals and how well it aligns with the evolving expectations of the engineering industry.

For PEO 1, which aims to produce graduates who are practicing technicians in the electrical engineering field, the study found that 97% of graduates were employed in relevant industries, surpassing the 50% KPI. Stakeholder feedback indicated that graduates have successfully achieved the intended outcomes of PEO 1, particularly in terms of practical skills, technical competence and adaptability to workplace demands. However, stakeholders also emphasized the importance of strengthening graduates' exposure to current and emerging technologies, as well as enhancing their professional communication skills, to ensure continued relevance in a rapidly evolving industry environment. A summary of the analysis and stakeholder interview findings related to PEO 1 is presented in Table 4.1.

Table 4.1: The summary of the analysis and the results of the interviews for PEO 1

PEO	Achievement (%)		
	KPI 2021 Cohort	Achievement 2021 Cohort	KPI 2022 Cohort
	> 50	97	> 50
PEO 1 Practicing Technician in Electrical Engineering Related Field	Interview Findings:		
	Graduates demonstrated strong hands-on skills, technical competencies, and adaptability to industry requirements. However, enhancement in current technology exposure and professional communication is still required.		

PEO 2 recorded an achievement of 99% for the 2021 cohort, significantly exceeding the established KPI of 65% and surpassing the revised KPI of 65% set for the 2022 cohort.

Stakeholder interview findings indicated that graduates demonstrated good professional ethics, effective teamwork, and a strong sense of social responsibility through their participation in community service and CSR activities. These findings suggest that graduates have successfully attained the intended outcomes of PEO 2. Nevertheless, stakeholders highlighted the need for continuous improvement in communication skills and self-confidence to further enhance graduates' professional effectiveness and societal contributions. A detailed summary of the analysis and stakeholder interview findings related to PEO 2 is presented in Table 4.2.

Table 4. 2: The summary of the analysis and the results of the interviews for PEO 2

PEO	Achievement (%)		
	KPI 2021 Cohort	Achievement 2021 Cohort	KPI 2022 Cohort
	> 65	99	> 65
PEO 2 Contributing to society with professional ethics and responsibilities	Interview Findings:		
	Graduates exhibited good professional ethics, teamwork, and social responsibility through CSR and community involvement. Nevertheless, communication skills and self-confidence should be further strengthened.		

The assessment results indicate that PEO 3 was successfully achieved by the 2021 cohort, recording an achievement rate of 42%, which exceeded the established KPI of more than 40%. Stakeholder feedback revealed that graduates demonstrated potential in entrepreneurial activities and were able to leverage their engineering knowledge and technical skills across diverse career pathways, particularly within the telecommunications and information technology industries. Stakeholders also recognised the broad employment opportunities available to graduates in these sectors. Nevertheless, greater efforts are needed to enhance graduates' career awareness, industry exposure, and understanding of entrepreneurial opportunities to further strengthen their engagement in enterprising activities and support lifelong career development. These proposed improvements are outlined in Table 4.3, which summarises the stakeholder interview findings related to PEO 3.

Table 4. 3: The summary of the analysis and the results of the interviews for PEO 3

PEO	Achievement (%)		
	KPI 2021 Cohort	Achievement 2021 Cohort	KPI 2022 Cohort
	> 40	42	> 40
PEO 3 Engaging in enterprising activities that apply engineering knowledge and technical skills	Interview Findings:		
	Graduates showed potential in entrepreneurship and broad career opportunities within telecommunications and IT industries. However, greater career awareness, industry exposure, and understanding of entrepreneurial opportunities are needed.		

As for PEO 4, which emphasizes lifelong learning and career advancement, the achievement rate for the 2021 cohort was 57%, exceeding both the established KPI of 45% and the revised KPI of 45% for the 2022 cohort. This result indicates that a substantial proportion of graduates actively engaged in activities that enhanced their knowledge and supported their professional growth, including pursuing further studies, obtaining professional certifications, and participating in career development initiatives.

Stakeholder interview findings further revealed that graduates demonstrated positive awareness and commitment towards lifelong learning, professional development, and career advancement. These findings suggest that the programme has been effective in fostering a culture of continuous learning and supporting graduates in adapting to evolving industry demands. Nevertheless, stakeholders highlighted the need to further strengthen the culture of continuous professional development among graduates to ensure sustained career progression and long-term employability. A detailed summary of the analysis and stakeholder interview findings related to PEO 4 is presented in Table 4.4.

Table 4. 4: The summary of the analysis and the results of the interviews for PEO 4

PEO	Achievement (%)		
	KPI 2021 Cohort	Achievement 2021 Cohort	KPI 2022 Cohort
	> 45	57	> 45
PEO 4 Engaging in activities to enhance knowledge for successful career advancement	Interview Findings:		
	Graduates demonstrated positive awareness towards lifelong learning, professional certifications, and career development. However, continuous professional development culture should be further reinforced.		

The assessment of the PEOs for the DEP programme at Politeknik Port Dickson demonstrates that the programme has successfully achieved its intended educational objectives, as summarized in Table 4.5. Based on the analysis of graduate survey data and stakeholder interview findings, all four PEOs recorded achievement rates that exceeded their respective KPI targets. These results indicate the effectiveness of the programme in producing graduates who are technically competent, professionally responsible, enterprising, and committed to lifelong learning and continuous professional development. Table 4.5 summarises the achievement status of all PEOs for the 2021 cohort, where each PEO exceeded the established KPI target and was therefore considered achieved.

Table 4. 5: Summary of PEO Achievement for the 2021 Cohort

PEO	KPI	Achievement	Status
PEO1	>50%	97%	Achieved
PEO2	>65%	99%	Achieved
PEO3	>40%	42%	Achieved
PEO4	>45%	57%	Achieved

The overall findings suggest that the DEP programme remains relevant to current industry requirements and has been effective in preparing graduates for employment, professional

practice, ethical responsibilities, entrepreneurial engagement, and career advancement. The positive feedback obtained from industry stakeholders and alumni further supports the programme's ability to produce graduates who possess the competencies and attributes expected by employers.

Nevertheless, stakeholders identified several areas for continuous improvement, including greater exposure to emerging technologies, enhancement of professional communication skills, increased industry and entrepreneurial awareness, and the promotion of lifelong learning practices. These recommendations provide valuable input for CQI initiatives aimed at strengthening curriculum delivery, industry collaboration, and graduate development.

Overall, the assessment confirms that the DEP programme continues to meet its educational objectives and remains aligned with industry expectations. The findings will serve as an important reference for future curriculum enhancement and quality assurance efforts to ensure that DEP graduates remain competitive, adaptable, and relevant in an increasingly dynamic technological environment.

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6.0 REPORT VERIFICATION

It is hoped that the PEO performance report for DEP programme Department of Electrical Engineering, Politeknik Port Dickson graduated in the 2021 cohort will contribute towards improving quality in education and training in Polytechnic Malaysia as well as strengthening the planning of polytechnic studies programmes in the future.

Prepared by;



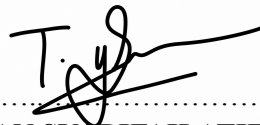
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PEO Evaluation Committee

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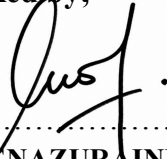
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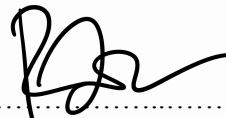
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GRADUATE ACHIEVEMENT AND STAKEHOLDER PERSPECTIVES ON PROGRAMME EDUCATIONAL OBJECTIVES: COHORT 2021

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