



KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI



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

DIPLOMA IN ELECTRICAL ENGINEERING -DET

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 Electrical Engineering - DET. 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 the 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 and electrical discipline as well as 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 Electrical Engineering (DET) is a three-year full-time programme comprising of five semesters course work with one full semester of industrial training.

1.2.1 Synopsis

The DET programme covers the broad discipline of electrical engineering which includes electrical and electronic principles, computer fundamental and programming, computer aided design, semiconductor devices, wiring installation, power system, electrical machine and programmable logic controller. The green technology elements are also incorporated in the curriculum to provide awareness toward the importance of sustainable energy.

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 DET 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	Statement	% Target KPI
		2021 Cohort
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 DET 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 ?

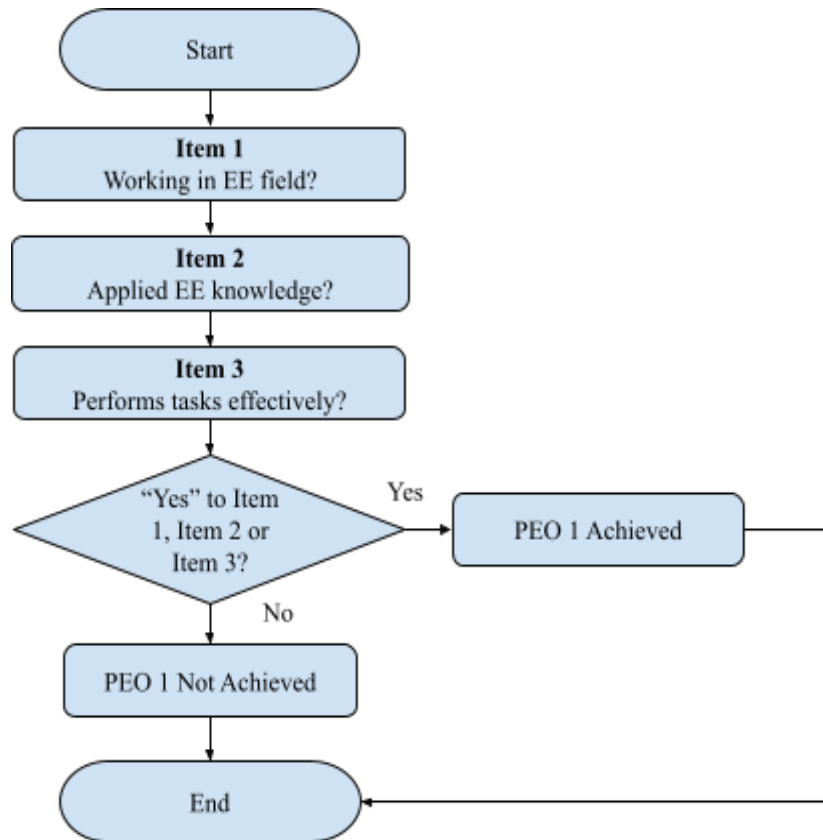


Figure 2.1: Flowchart Measurement of PEO 1

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)?

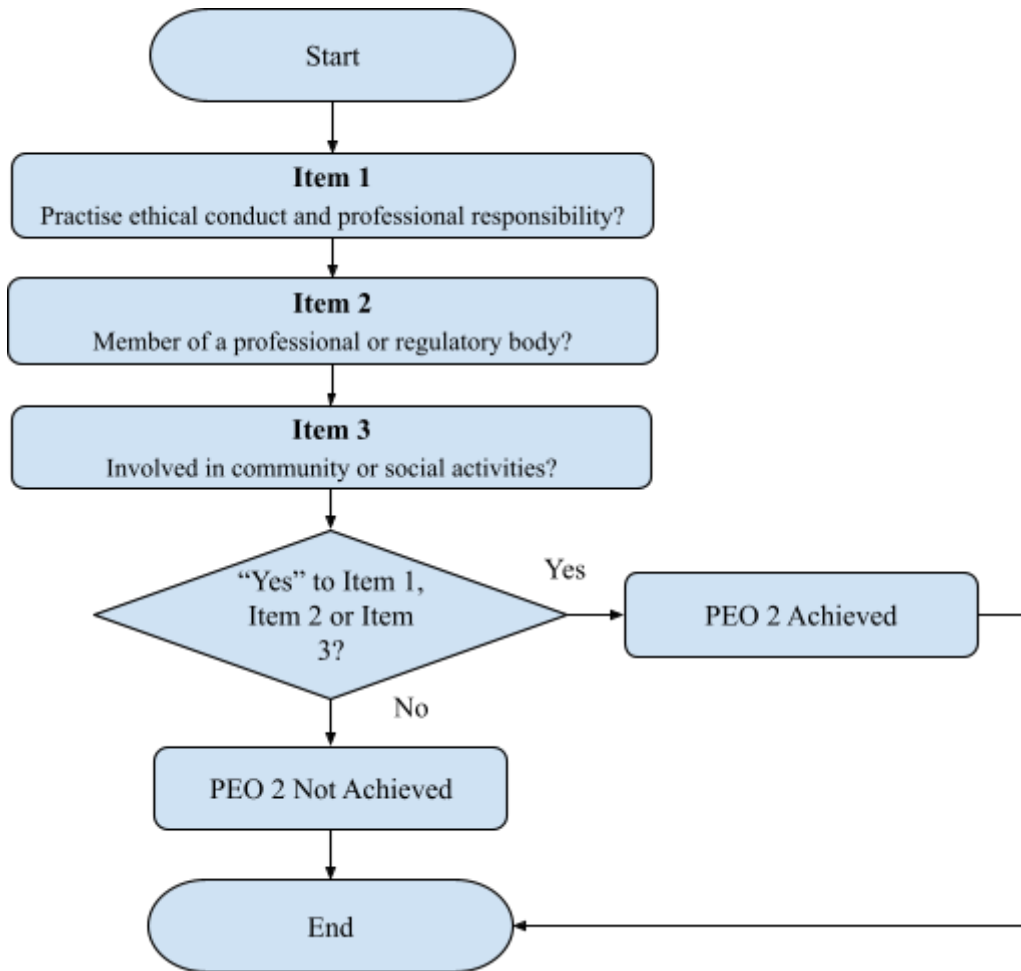


Figure 2.2: Flowchart Measurement of PEO 2

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?

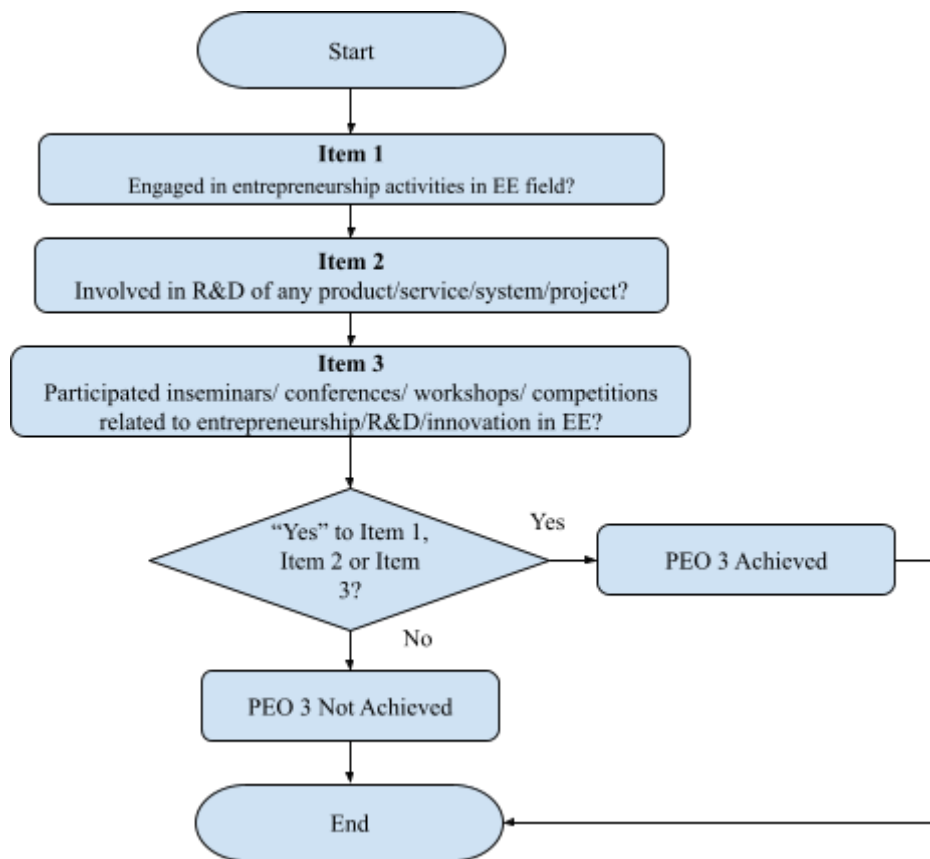


Figure 2.3: Flowchart Measurement of PEO 3

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.

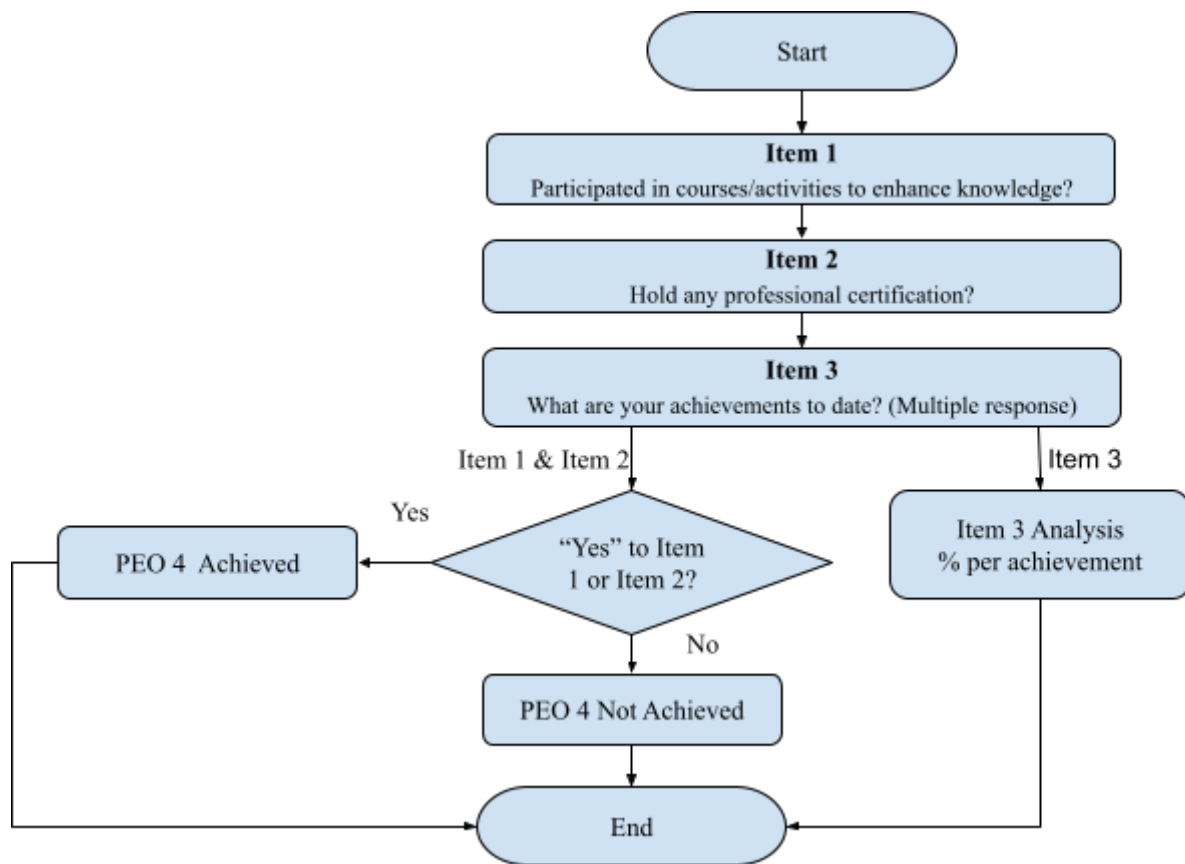


Figure 2.4: Flowchart Measurement of PEO 4

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 DET program, a total of 171 graduates were recorded from the 2021 cohort, based on data obtained from the Sistem Pengurusan Maklumat Politeknik (SPMP), Politeknik Port Dickson. Out of these, 171 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 DET program meets the required respondent percentage. Additionally, Table 3.1 presents the overall distribution of respondents by gender for DET programs.

Table 3. 1: Total respondents by gender

Programme	Male	Female	Total respondent	Total graduates	Percentage of Respondents (%)
DET	152	19	171	171	100%

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: 150 respondents (88%) answered "Yes", while 21 respondents (12%) 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: 158 respondents (92%) answered "Yes", while 13 respondents (8%) 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: 162 respondents (95%) answered "Yes", while only 9 respondents (5%) 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	150	88%	21	12%
	Applied electrical/electronic knowledge	158	92%	13	8%
	Performed technical tasks in the field	162	95%	9	5%

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 171 respondents, 166 graduates (97%) were classified as having achieved PEO 1, while only 5 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	166	97%
		Not working in field	5	3%

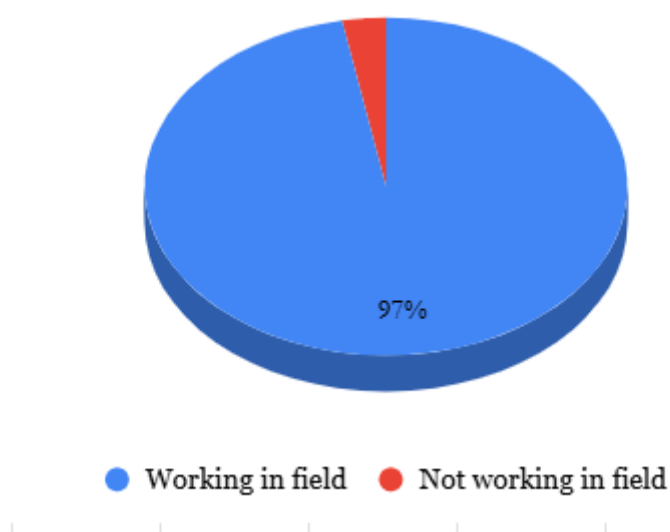


Figure 3. 1: Percentage achievement of PEO 1

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: 168 respondents (98%) answered "Yes", while only 3 respondent (2%) 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: 90 respondents (53%) answered "Yes", while 81 respondents (47%) answered "No". This suggests that while a portion of graduates have joined professional or regulatory bodies such as BEM, IEM, or IEEE, almost half have yet to attain formal professional membership, which may reflect the early stage of their careers.

Item 3 : Community & social involvement: 111 respondents (65%) answered "Yes", while 60 respondents (35%) 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	168	98%	3	2%
	Professional membership	90	53%	81	47%
	Community & social involvement	111	65%	60	35%

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 171 respondents, 170 graduates (99%) were classified as having achieved PEO 2, while only 1 graduate (1%) was classified as not 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	170	99%
		Not involved and not contributed to society	1	1%

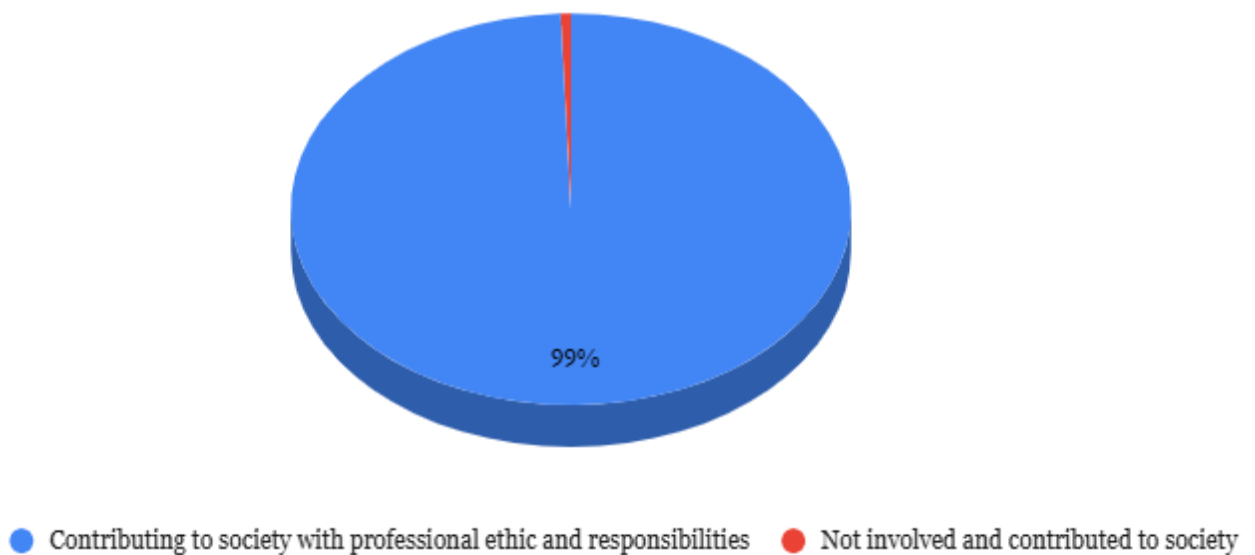


Figure 3.2: Percentage achievement of PEO 2

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: 78 respondents (46%) answered "Yes", while 93 respondents (54%) answered "No". This is the highest achievement rate among the three items, indicating that 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: 62 respondents (36%) answered "Yes", while 109 respondents (64%) 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: 76 respondents (44%) answered "Yes", while 95 respondents (56%) answered "No". This indicates that only a small proportion of graduates 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	78	46%	93	54%
	Involved in R&D of products, services, or systems	62	36%	109	64%
	Participated in seminars, workshops, conferences, or competitions on entrepreneurship, R&D, or innovation	76	44%	95	56%

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 171 respondents, 112 graduates (65%) were classified as having achieved PEO 3, while 59 graduates (35%) 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 65% involved in enterprising activities against 35% not involved.

The overall PEO 3 achievement rate of 65% 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	112	65%
		Not involved and contributed to society	59	35%

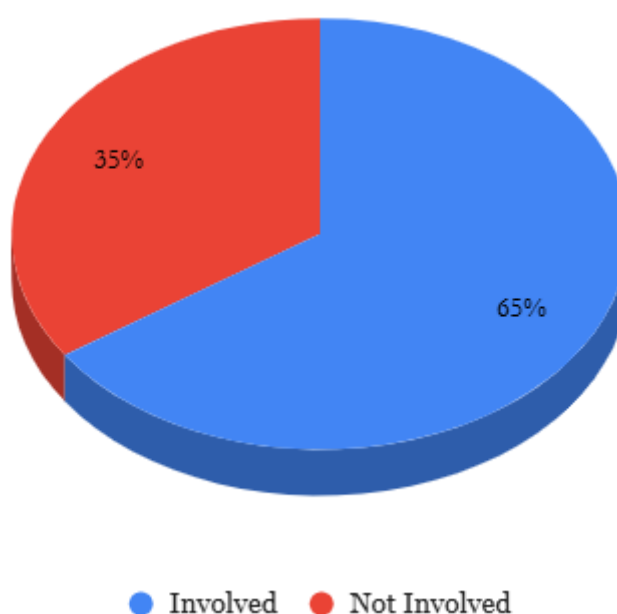


Figure 3.3: Percentage achievement of PEO 3

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: 116 respondents (68%) answered "Yes", while 55 respondents (32%) 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: 76 respondents (44%) answered "Yes", while 95 respondents (56%) answered "No". This suggests that close to half of graduates have attained a professional certification, indicating that while formal professional recognition is still developing among the 2021 cohort, a considerable proportion have already taken steps toward achieving recognised competency standards in their field.

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	116	68%	55	32%
	Professional certification status	76	44%	95	56%

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: 138 respondents (81%) reported a salary increase, 63 respondents (37%) reported a promotion, 15 respondents (9%) reported establishing their own business, 43 respondents (25%) reported pursuing further education, 8 respondents (5%) selected not applicable, and 3 respondents (2%) selected other, specifying roles such as Army, Project Engineer, and Professional Training and Education for Growing Entrepreneurs. 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 at 81%, indicating that a

large majority of graduates have progressed in terms of remuneration since completing their studies, which reflects positively on the programme's contribution to graduates' career advancement.

Table 3.9: Percentage self-reported achievements of graduates

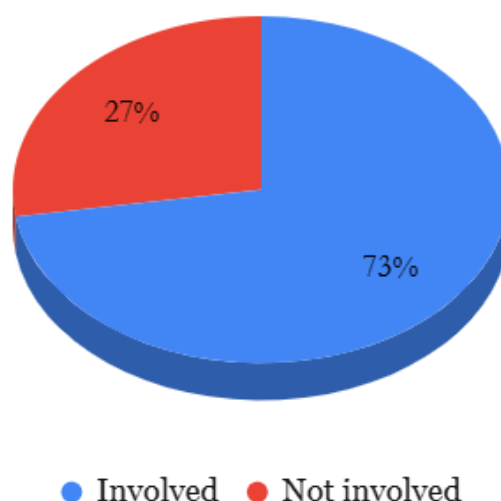
Achievements to date	No. of Respondent	
	Yes	Achievement%
Salary increase	138	81%
Promotion	63	37%
Own business	15	9%
Further education	43	25%
Not applicable	8	5%
Other: Join Army, Project Engineer, Professional Training and Education for Growing Entrepreneurs	3	2%

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 171 respondents, 124 graduates (73%) were classified as having achieved PEO 4, while 47 graduates (27%) were classified as not having achieved PEO 4, having answered "No" to both items. This is clearly illustrated in the pie chart, which shows 73% involved against 27% not involved.

The overall PEO 4 achievement rate of 73% 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.	124	73%
		Not involved	47	27%

**Figure 3.4: Percentage achievement of PEO 4**

3.1.5 Summary

The overall analysis of the PEO achievement for the DET 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, 65% 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, 73% 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 DET 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 DET programme in fulfilling its educational mission.

Table 3.11: The overall achievement for DET programme

PEO	KPI 2021 Cohort	Analysis PEO	DET Achievement		
			No. of Respondent	Achievement (%)	Status
PEO 1: Practicing technician in electrical engineering related field	>50%	Working in field	166	97%	Achieved
		Not working in field	5	3%	
		TOTAL	171	100%	
PEO 2: Contributing to society with professional ethic and responsibilities	>65%	contributing to society with professional ethic and responsibilities	170	99%	Achieved
		Not involved and contributed to society	1	1%	
		TOTAL	171	100%	

PEO 3: Engaging in enterprising activities that apply engineering knowledge and technical skills	>40%	Involved in Enterprising Activities, Research and Development	112	65%	Achieved
		Not involved and did not contributed to society	59	35%	
		TOTAL	171	100%	
PEO 4: Engaging in activities to enhance knowledge for successful career advancement	>45%	Involvement in activities to enhance knowledge for successful career advancement.	124	73%	Achieved
		Not involved	47	27%	
		TOTAL	171	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. Five stakeholders representing the DET programme, comprising members of the IAP and alumni, attended the session. All respondents possess professional experience in the electrical engineering industry or other fields relevant to the programme.

This study forms part of the Department of Electrical Engineering (DEE) CQI initiative in strengthening the programme and ensuring that the field of study offered at polytechnics remains aligned with current industry demands. Accordingly, it examined stakeholders' feedback regarding the achievement of the PEOs for the DET 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 DET programme in fulfilling industry expectations.

Table 3.12: Stakeholders Respondent Profiles

Respondents	Category	Name	Position & Organization	Year of Experience
Respondent 1	IAP	Tn. Hj. Helmi Zakuan bin M Haroon Fahmie	Technical Consultant, Kaizer Electrical Engineering	18 years
Respondent 2	IAP	Ts. Mohammad Fakhri bin Abdul Ghani	Assistant Manager Consulting Sales Southern	11 years
Respondent 3	alumni	En. Muhammad Hishammudin bin Mat Zin	Jurutera Elektrik Bridge Data Centres Malaysia Sdn. Bhd.	3 years
Respondent 4	alumni	Muhammad Nabil bin Nazim	Automation Technician Vepro Group Sdn. Bhd.	4 years
Respondent 5	alumni	Muhammad Noor Akmam bin Mohtar	IT Technical Duta-Ulu Kelang Expressway, Kuala Lumpur	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 DET 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 DET programme. However, a few respondents provided additional suggestions and recommendations to further enhance the clarity and effectiveness of the PEOs, either by sharing their views during the presentation session or through feedback submitted via the Google Form.

3.2.1 Stakeholders Feedback on PEO 1

The evaluation of PEO 1 focuses on graduates' ability to demonstrate sound technical knowledge and competencies in the field of electrical and electronic engineering. Feedback from the stakeholder highlighted the importance of ensuring that the assessment instrument accurately reflects the intended outcome and provides a realistic measurement of graduate achievement. While the overall attainment was acknowledged, concerns were raised regarding the use of the term “competent” and the appropriateness of the assessment approach used to measure this attribute.

...merujuk kepada PEO 2014, knowledgeable and technically competent in electrical and electronic, perkataan competent ini saya rasa terlalu besar untuk kita buat pengukuran kerana kalau just experience tiga tahun atau lima tahun ni kompetensi tu diukur dengan satu persijilan yang profesional. Saya rasa mungkin dari segi apa ni achievement tu saya tiada apa sangat nak komen, cuma dari segi perkataan competent yang wujud dalam PEO statement itu telah memerangkap pada soalan-soalan yang dibuat dalam soal selidik ini sebab iya hanya YA dan TIDAK. Saya tak tahu apa level competent yang dia boleh, so pengalaman saya daripada yang intern dengan company saya ini, nak katakan achievement to competency memang jauh sekalilah, walaupun dah lima tahun pun masih lagi tak boleh di propose to be a competent person dalam bidang electrical especially... (Respondent 1)

The stakeholder noted that the term “competent” may be too broad and difficult to measure through a simple survey, particularly when competency in the electrical field is often associated with professional certification and extensive industry experience. The use of binary responses such as “Yes” and “No” may not adequately capture the actual competency level of graduates, potentially leading to an overestimation of achievement.

The stakeholder further emphasised that the assessment should be aligned with the specific nature of each engineering discipline and should involve feedback from relevant industry practitioners to ensure a more accurate evaluation of graduates' competencies.

...saya setuju dengan pendapat daripada En Jasrul Jamani tadi sebab ianya terbuka terlalu luas dan pengukurannya itu tidak menjurus kepada perspektif kepada bidang masing-masing. Contoh dikatakan oleh Tc. Muhammad Iqbal mungkin bidang tertentu, scope kerja sangat related dengan apa yang dipelajari di Politeknik. Tetapi untuk electrical ni bila sebut tentang wiring especially, dia agak jauh ketinggalan dari segi kita kena retrain balik semula dan intern itu pun ada juga isu-isu lain yang terlibat dari segi attitude dan sebagainya. Cuma saya tengok itulah saya kata tadi kalau soalan ini jangan sampai terperangkap dari segi mendapatkan peratus yang tinggi sebab YA dan TIDAK ini biasanya dia jawab tiada pengukuran, mungkin boleh tambah juga satu daripada bidang ini untuk mendapatkan information daripada stakeholder atau kontraktor-kontraktor yang sebenar dari segi menilai kompetensi.... (Respondent 1)

In addition, concerns were raised regarding the alignment between curriculum content and current industry requirements.

...dan yang kedua saya nak tanya juga, ketika tuan puan membuat semakan kurikulum ada tak mendapat pertimbangan atau pandangan daripada IAP ataupun sesiapa yang tuan puan lantik sebagai pakar industri untuk melihat content of the kurikulum itu selari tak dengan apa yang berlaku pada hari ini. Kadang kita lihat content tu termasuk yang baru tapi kadang kita meninggalkan prinsip subjek itu sendiri, menyebabkan bila kita tanya secara asasnya basic contohnya electrical circuit 1, student itu tidak dapat menjawab apa beza ohm's law and kirchhoff's law, jadi seolah-olah mereka tidak dapat memahami apakah prinsip asas. Teknologi akan datang sentiasa berubah but prinsip tetap di situ, jadi prinsip itu yang perlu ada penekanan. Saya nampak kurikulum ini juga perlu follow untuk mendapatkan maklumat, adakah pihak industri sama-sama bersetuju jika tuan review atau menambah baik dalam bentuk pembangunan kurikulum.... (Respondent 1)

The stakeholder stressed that although technology continuously evolves, fundamental engineering principles remain essential. Despite these concerns, the stakeholder acknowledged that graduates generally possess the technical knowledge and practical skills

required to perform effectively in the workplace. The feedback suggests that future improvements should focus on enhancing the assessment methodology rather than questioning the relevance of the programme outcomes themselves. Therefore, future curriculum reviews should continue to involve industry experts to ensure that graduates possess strong engineering fundamentals while meeting current industry competency requirements.

Overall, the stakeholder acknowledged the achievement of PEO 1 but recommended a review of the assessment instrument, particularly regarding the measurement of competency. The assessment should incorporate more discipline-specific indicators and industry-based evaluations to ensure a more accurate representation of graduate capabilities. Furthermore, continuous curriculum review with industry participation is essential to maintain the relevance and effectiveness of graduate preparation.

3.2.2 Stakeholders Feedback on PEO 2

PEO 2 evaluates graduates' professional engagement, communication abilities and participation in professional organisations. Feedback from the stakeholder focused primarily on the quality of the assessment instrument and the need for more structured and measurable evaluation criteria.

...So far bila saya nampak ada dua maklumbalas PEO ini yang berkaitan dengan soalan yang diberi pandangan oleh panel-panel IAP tadi banyak benarnya sebab saya melihat dari segi pengalaman saya sebagai speaker dan penceramah buat item soalan, saya nampak soalan-soalan ini tidak memenuhi syarat-syarat SMARTO, maknanya mestilah spesifik, boleh measurable, reliable, ada masa yang boleh diukur, dan boleh di observable boleh diperhatikan maknanya apabila kita mahu bina soalan tu mestilah menepati sekurang-kurangnya daripada lima, empat ciri-ciri tadi supaya orang yang menjawab soalan tadi nampak apa sebenarnya hala tuju soalan itu... (Respondent 1)

The stakeholder highlighted that several assessment items did not sufficiently fulfil the SMARTO principles, namely being Specific, Measurable, Achievable, Reliable, Time-bound

and Observable. As a result, respondents may interpret the questions differently, leading to inconsistencies in the collected data.

...item yang akan datang perlu review balik. Saya bersetuju dengan pandangan yang lain tadi, sebenarnya soalan ini perlu review semula untuk menggunakan prinsip SMARTO tadi supaya tidak lah masing-masing mengaggap perlu ke CIDB. Setakat ini semua orang perlu ambil sebab akan duduk dalam mana-mana industri sebagai langkah keselamatan. Sebab saya nampak conclusion pada perbincangan hari ini, pihak Polipd perlu bawa/ panjangkan perkara ini kepada pihak atasan untuk melihat semula bentuk soalan ini dan perlu dinilai. Terima kasih kepada puan yang berkata terlibat membuat soalan, ada kemungkinan pada masa akan datang perlu ada seorang pegawai daripada bahagian penilaian hadir untuk menilai kualiti soalan itu sahaja... (Respondent 1)

The stakeholder recommended that future assessment items be reviewed and redesigned according to recognised assessment principles to improve the validity and reliability of the findings. The feedback also suggested involving personnel with expertise in assessment and evaluation during the instrument development process to enhance question quality. Although concerns were raised regarding the quality of the assessment instrument, stakeholders generally agreed that graduates have demonstrated professional ethics, effective communication skills, and positive workplace behaviour. Therefore, the recommendations mainly focus on improving the accuracy and reliability of future assessments rather than the achievement of the PEO itself.

The findings indicate that the achievement of PEO 2 should continue to be assessed using more robust and structured instruments. Future assessments should adopt SMARTO principles to ensure that the collected data accurately reflect graduates' professional engagement and development. Strengthening the quality assurance process in questionnaire development will contribute to more meaningful and actionable assessment outcomes.

3.2.3 Stakeholders Feedback on PEO 3

PEO 3 focuses on graduates' entrepreneurial awareness, leadership potential, and ability to explore career opportunities within the electrical engineering sector. The stakeholder emphasised the importance of exposing students to the diverse career pathways available within the industry.

...Saya sebenarnya pernah usulkan satu cadangan, tapi saya rasa dah hilang dan sebab dah lima ke enam tahun lepas. Untuk bahagian saya, kontraktor elektrik, kita ada lima bidang competent atau lima bidang kerja yang ada dalam pekerjaan elektrik. Jadi saya pernah cadangkan supaya saya nak memanggil kelima-lima bidang ini untuk berdiskusi dengan pelajar-pelajar DET khususnya untuk memberi gambaran pada pelajar-pelajar, dalam bidang elektrik kontraktor ini, apakah bidang kerja dia bukan setakat wiring sahaja. Kita ada underground cable, pencahayaan lampu iklan, dan beberapa lagi item saya tak berapa ingat, jadi kita ada lima item di situ... (Respondent 1)

The stakeholder noted that many students are only aware of limited career opportunities within the electrical engineering field and may not fully understand the breadth of employment and entrepreneurial prospects available. Exposure to various industry sectors would enable students to make more informed career decisions.

... kalau kita dapat mengadakan satu simposium ataupun forum dengan pelajar-pelajar untuk menunjukkan hala tuju. Kalau berminat dalam perniagaan, apa mereka perlu buat dan apa juga pilihan yang mereka ada berdasarkan minat ataupun keinginan. Jadi saya rasa perlu diambil pertimbangan. Saya setuju dengan cadangan Tc. Muhammad Iqbal tadi kalau pelajar tiada peluang dan tidak tahu nak jadi apa, tapi bila dia dah keluar baru dia nampak apa itu pasaran kerja yang ada yang berkaitan dengan kursus yang sedang diambil. Jadi saya cadangkan kalau boleh review semula cadangan saya yang dahulu lebih kurang enam tahun lepas untuk mengadakan satu forum kepada semua pelajar khususnya DET untuk melihat hala tuju kemudian pilihan atas mereka sama ada nak menjadi usahawan atau sebaiknya. Jadi yang penting kita bagi ruang untuk pencerahan bidang pembelajaran yang dia belajar dan peluang usahawan yang berkaitan dengan program yang diikuti itu... (Respondent 1)

The stakeholder proposed organising forums, symposiums, and industry-sharing sessions involving practitioners from various sectors of the electrical industry. Such initiatives would provide students with better career guidance and entrepreneurial awareness while helping them understand the pathways available after graduation. The stakeholder believed that increased industry exposure would help students better understand the diverse career opportunities available within the electrical engineering sector. Such exposure may also encourage entrepreneurial participation and support graduates in making informed career decisions after graduation.

Overall, the stakeholder emphasised the need to strengthen students' exposure to industry career pathways and entrepreneurial opportunities. Greater engagement with industry practitioners through forums and professional sharing sessions would support students in making informed career choices and foster entrepreneurial awareness aligned with industry needs. Such initiatives would also strengthen academia-industry collaboration and improve graduates' career readiness.

3.2.4 Stakeholders Feedback on PEO 4

PEO 4 evaluates graduates' commitment to lifelong learning and continuous professional development. Feedback from the stakeholder highlighted the need for greater clarity regarding the definition and scope of professional certifications used within the assessment.

...Saya nak refer soalan no 2, adakah anda mempunyai sijil profesional. Di peringkat JPPKK, Diploma Politeknik, apakah profesional certificate yang ditakrifkan? Kalau tempoh dalam lima tahun kajian sebenarnya apakah profesional certificate yang diharapkan oleh pihak Politeknik supaya pelajar ini boleh dapat? Saya nak kongsi satu ruang ini, tapi saya nak tahu dulu apa yang boleh Politeknik senaraikan apakah bentuk profesional certificate.... (Respondent 1)

The stakeholder questioned the definition of “professional certificate” used in the survey and highlighted the possibility of differing interpretations among respondents. Without a clear

definition, graduates may report a wide range of certifications that vary significantly in terms of recognition and professional value.

...Saya nak cuba elaborate sedikit, kita mengaggap profesional certificate adalah satu organisasi yang mengeluarkan dia punya certificate dianggap profesional, tapi kadang-kadang ada juga certificate itu tidak diiktiraf di Malaysia. Cuma apa yang saya nak share atau tanya dengan Politeknik, apakah takrifan sijil profesional ini diperingkat Politeknik. Sebab kalau kita lihat sekarang ini di peringkat national kita nampak yang ada contoh dia ini kontraktor bidang suruhanjaya tenaga, this one pun kita assume sebagai profesional certificate sebab dia kompetensi, contoh kalau dari segi diving kita ada padi. Kita juga ada jabatan pembangunan kemahiran yang menilai kompetensi di peringkat yang tertentu daripada level tahap sijil hingga diploma. Cuma saya tak tahu takrifan apa yang digunakan oleh Politeknik yang menetapkan sijil profesional. Adakah dia datang daripada sijil di Malaysia sendiri atau luar negara atau sebagainya. Itulah kita nak faham tentang itu. Jadi mungkin perlu ada satu penjelasan which level is professional certificate....
(Respondent 1)

The stakeholder further emphasized that professional certifications may originate from various sources, including professional bodies, competency-based certification agencies, industry regulators, and skills development institutions. Therefore, a clear definition and classification system should be established to ensure consistency in data collection and interpretation. A standardized definition would improve the consistency of responses and ensure that the assessment accurately reflects graduates' engagement in lifelong learning and professional development activities.

In addition, clarification was provided that competency-based certifications in Malaysia may be obtained through both formal training and recognized work experience.

...sebenarnya sijil kemahiran di Malaysia ini tidak semestinya follow kurikulum yang ada dalam pusat pentauliah. Experience ke experience kerja itu juga telah dapat menggambarkan. Jadi maknanya setuju dia tiada extra, sama sahaja...(Respondent 1)

This observation highlights the importance of recognizing multiple pathways for professional and competency development throughout graduates' careers.

The stakeholder acknowledged the importance of professional certification as an indicator of lifelong learning and professional growth. However, clearer guidelines are required regarding the definition and scope of professional certifications used in the assessment process. Establishing a standardized framework for professional certification recognition would improve the consistency, reliability, validity and comparability of future PEO assessment results.

3.2.5 Summary

The stakeholder interview session provided valuable insights into the achievement of the Programme Educational Objectives (PEOs) and the effectiveness of the current assessment approach. Overall, stakeholders agreed that the DET programme continues to produce graduates with relevant technical knowledge, professional attributes, entrepreneurial awareness, and commitment towards lifelong learning.

For PEO 1, stakeholders acknowledged the importance of maintaining strong technical foundations while recommending improvements to the assessment instrument to better measure graduate competency and industry readiness. In relation to PEO 2, stakeholders highlighted the need to strengthen the quality of assessment items by incorporating recognised assessment principles such as SMARTO to improve data validity and reliability.

For PEO 3, stakeholders emphasised the importance of increasing students' exposure to career pathways and entrepreneurial opportunities within the electrical engineering sector through stronger industry engagement activities. Meanwhile, for PEO 4, stakeholders recommended establishing clearer definitions and classifications of professional certifications to ensure consistent interpretation and more accurate measurement of lifelong learning achievements.

Overall, the feedback obtained supports the continued relevance of the DET programme while providing useful recommendations for CQI. These recommendations will contribute to enhancing assessment practices, strengthening industry collaboration, and ensuring that the programme remains responsive to current and future industry needs. Collectively, these

findings provide strong evidence to support future curriculum enhancement and continuous quality improvement initiatives for the DET programme.

3.3 Proposed Continuous Quality Improvement

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	The instrument is too general and does not adequately reflect the programme's area of specialisation. Recommendation: Review and refine the instrument items to align more specifically with the programme's field of specialisation.	Respondent 1	UKE-BK

	Graduate competency assessment should involve employers or industrial supervisors. Recommendation: Develop an Employer Survey as a supporting instrument for PEO assessment.	Respondent 1	UKE-BK
PEO 2	The definition and classification of professional certifications are unclear, resulting in inconsistent interpretation among respondents. Recommendation: Develop a standardised definition and classification of professional certifications to improve consistency in future PEO assessments.	Respondent 1	UKE-BK
	The assessment instrument is overly general and does not fully comply with the SMARTO principles. Recommendation: Enhance the instrument by incorporating assessment items that are more specific, measurable, and observable, thereby improving the validity and reliability of PEO achievement measurement.	Respondent 1	UKE-BK

PEO 3	Recommendation: Organize industry forums, symposiums, and career-sharing sessions with industry practitioners to enhance students' awareness of career pathways and entrepreneurship opportunities, while strengthening collaboration and engagement with industry partners.	Respondent 1	DEE / UKE-BK
PEO 4	The definition of professional certification should be clarified to ensure consistent interpretation among graduates. Recommendation: Establish clear guidelines and a standardised framework for recognising professional certifications used in the PEO assessment.	Respondent 1	DEE / UKE-BK

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 DET 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 DET 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 Industry Advisory Panel (IAP) and selected alumni. This analysis aimed to assess the extent to which the DET 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 practising technicians in electrical engineering-related fields, the study found that the achievement rate for the 2021 cohort was 97%, significantly exceeding the established KPI of 50%. This result indicates that graduates have successfully acquired the technical knowledge and competencies required by industry. Stakeholders acknowledged the achievement of PEO 1 while recommending improvements to the assessment instrument, particularly in measuring graduate competency and programme-specific technical capabilities. Stakeholders also recommended involving employers or industrial supervisors in future assessments to provide a more comprehensive evaluation of graduate competency. These findings are further detailed in Table 4.1, which summarises the analysis and stakeholder interview findings related to PEO 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:		
	1) The instrument is too general and does not adequately reflect the programme's area of specialisation. 2) Graduate competency assessment should involve employers or industrial supervisors.		

A detailed summary of the analysis and stakeholder interview findings related to PEO 2 is presented in Table 4.2. PEO 2 recorded an achievement of 99% for the 2021 cohort, exceeding both the established KPI and the revised KPI of 65%. The findings indicate that graduates have demonstrated professional ethics, workplace responsibility, and positive professional behaviour.

Nevertheless, stakeholders highlighted several issues related to the assessment instrument, particularly the ambiguity surrounding the definition of professional body membership. Confusion may arise between professional bodies such as MBOT, BEM, IEM, and IEEE, and other organisations such as CIDB and NIOSH. In addition, stakeholders recommended that future assessment instruments should be redesigned based on SMARTO principles to improve the validity, reliability, and consistency of data collection.

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:		
	1) The definition and classification of professional certifications are unclear, resulting in inconsistent interpretation among respondents. 2) The assessment instrument is overly general and does not fully comply with the SMARTO principles.		

The assessment results indicate that PEO 3 was successfully achieved by the 2021 cohort, recording an achievement rate of 65%, which exceeded the established KPI of more than 40%. Stakeholder feedback emphasised the importance of exposing students to a broader range of career pathways and entrepreneurial opportunities within the electrical engineering industry. It was suggested that industry forums, symposiums, and career-sharing sessions involving practitioners from different sectors be organised regularly to enhance students'

awareness of employment opportunities and entrepreneurship prospects. These initiatives would strengthen industry engagement while supporting graduates in making informed career decisions. A summary of the analysis and stakeholder interview findings related to PEO 3 is presented in Table 4.3.

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	65	> 40
PEO 3 Engaging in enterprising activities that apply engineering knowledge and technical skills	Interview Findings:		
	Organize industry forums, symposiums, and career-sharing sessions with industry practitioners to enhance students' awareness of career pathways and entrepreneurship opportunities, while strengthening collaboration and engagement with industry partners.		

As for PEO 4, which focuses on lifelong learning and career advancement, the achievement rate for the 2021 cohort was 73%, exceeding both the established KPI and the revised KPI of 45%. This achievement demonstrates that graduates remain committed to continuous learning and professional development after graduation. Stakeholders acknowledged the importance of lifelong learning in ensuring graduates remain relevant within an increasingly dynamic technological environment.

However, they also recommended increasing exposure to current and emerging technologies within the electrical engineering field to further strengthen graduates' professional growth and adaptability. 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	73	> 45
PEO 4 Engaging in activities to enhance knowledge for successful career advancement	Interview Findings:		
	The definition of professional certification should be clarified to ensure consistent interpretation among graduates.		

The assessment of the PEOs for the DET programme at Politeknik Port Dickson demonstrates that the programme has successfully achieved its intended educational objectives. 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 findings indicate that the programme remains effective in producing graduates who possess strong technical competencies, professional ethics, entrepreneurial awareness, and a commitment to lifelong learning. 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%	65%	Achieved
PEO4	>45%	73%	Achieved

The overall findings suggest that the DET programme continues to be relevant to current industry needs and expectations. Nevertheless, several opportunities for improvement were identified, including enhancing the specificity of assessment instruments, strengthening industry participation in graduate competency evaluation, increasing students' exposure to industry career pathways and entrepreneurship opportunities, and expanding exposure to emerging technologies. These recommendations provide valuable input for CQI initiatives and will support future curriculum enhancement and programme development.

Overall, the assessment confirms that the DET programme continues to meet its educational objectives and remains aligned with industry expectations. The findings will serve as an important reference for future quality assurance and curriculum review activities to ensure that DET graduates remain competitive, adaptable, and responsive to technological and industrial change

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6.0 REPORT VERIFICATION

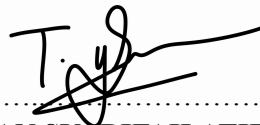
It is hoped that the PEO performance report for DET programme Department of Electrical Engineering, Politeknik Port Dickson graduated in the 2021 cohort will contribute towards improving quality in education and training in Polytechnic Malaysia as well as strengthening the planning of polytechnic studies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

Prepared by;



(Ts. Dr. NORHANANI ABD RAHMAN)

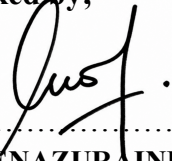
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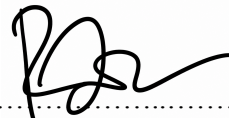
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