LAPORAN KAJIAN PENCAPAIAN

***PROGRAMME EDUCATONAL OBJECTIVES* (PEO)**

NYATAKAN NAMA PROGRAM SILA ISIKAN NAMA INSTITUSI

1.0 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.

**(Isikan nama institusi) Vision**

To be a towering TVET institution globally.

**(Isikan nama institusi) 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.

* 1. **The overview of Programme Educational Objectives (PEOs)**

There are five (5) programmes offered at Department of Electrical Engineering (DEE),

(Isikan nama institusi) namely, (Isikan nama program yang terlibat di institusi cth: Diploma in wwww - W, Diploma in xxxx - X, Diploma in yyy - Y, Diploma in zzzz – Z. The objectives of a programme should produce balanced TVET graduates that are set across four (4) Programme Educational Objectives (PEOs) as indicated in Table 1.1.

**Table 1. 1** Programme Educational Objectives (PEO)

|  |  |
| --- | --- |
| PEO1 | Practicing Technician in Electrical Engineering Related Field |
| PEO2 | Contributing to society with professional ethics and responsibilities |
| PEO3 | Engaging in enterprising activities that apply engineering knowledge and technical skills |
| PEO4 | Engaging in activities to enhance knowledge for successful career advancement |

* 1. **Objective of Study**

To carry out this study, several objectives have been identified as below.

i. To identify the frequency ability of practicing technician in electrical engineering related field among graduates (PEO1). ii. To identify the frequency ability of contributing to society with professional ethic and responsibilities among graduates (PEO2).

* + 1. To identify the frequency ability of engaging in enterprising activities that apply engineering knowledge and technical skills among graduates (PEO3).
    2. To identify the frequency ability of engaging in activities to enhance knowledge for successful career advancement among graduates (PEO4).

2.0 DATA COLLECTION METHOD

The findings of this study are to outline the answers to the research questions, which are to determine whether students achieve all the PEOs. To answer the question of the study, the reviewers used Dichotomous question or Close-ended question to answer the PEO1-PEO4 to explain the respondent's work in the field of engineering, questionnaire on professional ethics, enterprising activities that apply engineering knowledge and successful career advancement. Data analysis from Analysis Programme Educational Objective (PEO) (Pilot Test) (2019) as a pilot test result is carried out through the frequency distribution process which is to show frequency and percentage which is used as a key performance indicator (KPI) for the achievement of PEO 2021. The data obtained is analysed based on the achievement of each PEO. One of all items in a PEO that reaches ‘Yes’ will be counted as the PEO is achieved. In addition, interview analysis was also conducted on the industry in support of research findings and improvement recommendations.

**2.1 Study Design**

For this study, the evaluation instruments were designed based on the objectives of the study as well as answering the research questions. The set of valuation instruments was divided into three parts i.e., Part A, B, and C. Part A is a section of respondents' demographic information containing only ten items divided into two categories, namely, background information and employment information.

**2.1.1 PEO1: Practicing Technician in Electrical Engineering Related Field**

PEO1 is an instrument in Part C i.e., knowledge and technical skills, this section includes two question items as stated below:

1. Are you working in the electrical and /or electronic field?
2. If yes, select the sector below:

Engineering / Manufacturing / Education / Information Technology / Computing /

Sales and Marketing / Transportation / Logistic / Defence / Security / Services / Training / Consultation / Other

1. Starting Position

Technician / Assistant Engineer /Supervisor

For Question 2, only respondents who answered 'Yes' will be considered to determine the percentage working in the field of (Isikan bidang kajian yang dilaksanakan cth: Electrical and Electronics).

**2.1.2 PEO2: Contributing to society with professional ethics and responsibilities**

PEO2 is a Part C2 instrument. Part C2 contains statements regarding competency, corporate social responsibility (CSR) and ethics. This part in total contains three items as described below:

1. Are you a member of any professional body or regulatory body (e.g: BEM/ IEEE/ MySet/ CIDB)
2. Have you ever practiced safety and health at your workplace? (e.g: personal protective equipment (PPE)
3. Have you ever been involved in any community activities? (e.g: Committee member of any residential area, NGOs)

The achievement of PEO2 only considers the percentage of respondents who answered 'Yes' and 'No' to see the actual achievement percentage for the PEO2.

**2.1.3 PEO3: Engaging in enterprising activities that apply engineering knowledge and technical skills**

Part C3 is an instrument in the analysis of PEO 3. This part is about entrepreneurship, communication and leadership, comprises the following four question items:

1. Are you involved in any form of business (including online/ part time)?

1. Do you have any experience in any of these activities? (eg. report writing/ presentation/ being a panel/ speaker for a forum/ communication via email).
2. Have you ever worked in a group or team at your workplace/during your further studies?
3. Have you ever led a team or group at your workplace/during your further studies? (eg: demonstrate procedure / give instructions to colleague)

Answers to non-working responders in Questions 1 and 2 need to be categorized into Not Applicable (NA) as the instrument of the question does not address the role of the respondent. The achievement of PEO3 does not need to take into account the percentage of NA, and only takes into account the percentage of respondents who answered ‘Yes’ and ‘No’ to see the actual percentage of achievement for PEO3.

**2.1.4 PEO4: Engaging in activities to enhance knowledge for successful career advancement**

PEO4 is an instrument in Part C4 which is Career Advancement. Analysis of respondent data based on three elements to refer to the career improvement of graduate’s careers for working, pursuing education and entrepreneurs. This section covers three question items as listed below:

1. What is your achievement thus far?
2. Have you ever been involved in the research or development of any products/ services/ system/ technical project?
3. Currently, are you furthering your study to a higher level than Diploma?

3.0 RESULTS AND ANALYSIS DATA

This PEO review analysis study was developed based on two analytical methods, the first of which is data from the results of questionnaires for graduates of the electrical engineering department who graduated in (Isikan graduan pelajar yang terlibat. Cth: batch 2016 and 2017). The survey was prepared by (Isikan nama Jabatan terlibat/ Institusi) and was opened for responses in late 2020. Meanwhile, the second analysis data is the result of interviews by industry advisers for each program appointed by the department that was conducted by (Isikan nama Jabatan terlibat/ institusi).

This study targets the collection of data to measure the proximity of graduates to the Program Objective (OP) / Program Educational Objective (PEO). The range of mean marks used as a measure is as follows:

|  |  |
| --- | --- |
| **Range of Min** | **Interpretation of mean scores** |
| 1.00 – 1.89 | Very Low |
| 1.90 – 2.69 | Low |
| 2.70 – 3.49 | Moderate |
| 3.50 – 4.29 | High |
| 4.30 – 5.00 | Very High |

*Source: Zaihan & Hilmun (2016)*

**3.1 Analysis of PEO of Questionnaire Method**

Up to 2019, there were about 1329 total graduates since the performance of the PEOs will only be counted for graduates with 3 to 5 years of working experience after graduation, thus data from the students that graduated in 2016 and 2017 are considered for the evaluation of the PEO’s achievement. In total, there are about 779 graduates or alumni who are expected to have working experience in the engineering field (Unit Peperiksaan (Isikan nama Institusi), 2019). Nonetheless, based on the data, only 200 respondents out of 779 graduates responded to the PEO’s survey form.

In addition, Table 3.1 shows the overall distribution of respondents by gender for four programmes in X.

**Table 3. 1** Total respondent by gender

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme** | **Male** | **Female** | **Total respondents** | **Total graduates** |
| W | 69 | 13 | 82 | 379 |
| X | 21 | 29 | 50 | 190 |
| Y | 20 | 13 | 33 | 172 |
| Z | 21 | 14 | 35 | 38 |
|  | **Total** |  | **200** | **779** |

**3.1.1 PEO1: Practicing Technician in Electrical Engineering Related Field**

PEO1 is a practicing technician in electrical engineering related field. PEO1 describes a technician who works in any industry with a job function in electrical or electronic discipline. Based on the collection data shown in Table 3.2, the achievement of the PEOs were based on the key performance indicator of 2016 and 2017 of JKE graduates.

**Table 3. 2** Percentage achievement of PEO1 for four programs

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PEO**  **CURRICULUM JUNE 2019** | **Analysis PEO** | **Achievement (%)** | | | | | | | |
| **W** | | **X** | | **Y** | | **Z** | |
| **T** | **A** | **T** | **A** | **T** | **A** | **T** | **A** |
| **PEO1**  Practicing  Technician in  Electrical  Engineering  Related Field | Working in electrical and/or electronic field | **>50%** | **68%** | **>50%** | **84%** | **>50%** | **33%** | **>50%** | **48%** |
| Working in other fields |  | 16% |  | 8% |  | 30% |  | 26% |
| Further studies or unemployed |  | 16% |  | 8% |  | 37% |  | 26% |

\*T – Target, A – Achievement

Overall, the percentage achievement for W and X programmes has met the indicator target more than 50%. In fact, about 68% W graduates and 84% from X graduates have been involved with work in the electrical or electronic field, while others are working in other fields, further study and unemployed. The results for the Y and Z programmes did not reach their target, which was 33% and 48%, respectively. This is due to more graduates from Y and Z programmes having opportunities for further study to higher levels and work not in the field, so, this indicates the percentage of PEO1 to be achieved is low. The results indicate the strength of PEO1, in which the programme has successfully produced professional workforces, capable and competently working in the field.

**3.1.2 PEO2: Contributing to society with professional ethics and responsibilities**

PEO2 is a contributing to society with professional ethics and responsibilities. PEO2 describes the graduate’s involvement in community activities which includes engineering and non-engineering work related to society, health and safety. During the activities, graduates instill awareness of the safety and health culture and suggest solutions pertaining to the environment and sustainability to the community. In performing the activities, the graduates adhere to professional ethics and responsibilities by following rules and regulations of the field. Table 3.3 shows the result indicates the strength of PEO2, in which all programmes have successfully performed the appropriate ethical responsibility.

**Table 3. 3** Percentage achievement of PEO2 for four programmes

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PEO**  **CURRICULUM JUNE 2019** | **Analysis PEO** |  | | **Achievement (%)** | | | | | |
| **W** | | **X** | | **Y** | | **Z** | |
| **T** | **A** | **T** | **A** | **T** | **A** | **T** | **A** |
| **PEO2**  Contributing to society with professional ethics and | Contributing to society with professional ethics and  responsibilities | **>50%** | **100%** | **>50%** |  |  | **82%** |  | **97%** |
|  |  |
| **100%** | **>50%** |
| **>50%** |
|  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |
| responsibilities | Not involved and contributed to society |  | **0%** |  | **0%** |  | **18%** |  | **3%** |
|  |
|  |
|  |

\*T – Target, A – Achievement

The finding also indicates only 18% and 3% of the graduates from Y and Z programmes were not involved and contributed to society. Indeed, the graduates recognized the importance of sharing their responsibility through engagement with the community, with more than 80% of batch 2016 and 2017 alumni from all programmes having contributed to society with professional ethics and responsibilities. The result shows that W and X programmes recorded 100% of graduates achieving PEO2. Overall, the percentage achievement PEO2 has met the indicator target more than the expectation.

**3.1.3 PEO3: Engaging in enterprising activities that apply engineering knowledge and technical skills**

PEO3 is engaging in enterprising activities that apply engineering knowledge and technical skills. PEO3 describes the enterprising activities which require effective communication and contribution as a team member. Enterprising activities involved business in engineering, research and development (R&D) and technical projects. Enterprising activities can be online or offline business. It also can be pursued either full time or part time basis. Summary of the current graduate’s employment involved in entrepreneurship and R&D activities respective to PEO3 is tabulated in Table 3.4.

**Table 3. 4** Percentage achievement of PEO3 for four programmes

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PEO**  **CURRICULUM**  **JUNE 2019** | **Analysis PEO** | **Achievement (%)** | | | | | | | |
| **W** | | **X** | | **Y** | | **Z** | |
| **T** | **A** | **T** | **A** | **T** | **A** | **T** | **A** |
| **PEO3**  Engaging in enterprising  activities that apply engineering knowledge  and technical  skills | Involved in entrepreneurial / R & D activities | **>30%** |  |  | **58%** |  |  |  | **71%** |
| **79%** | **>30%** | **>30%** | **52%** | **>30%** |
|  |  |  |  |  |
| Not involved in entrepreneurship  / R & D activities |  | **21%** |  | **40%** |  | **33%** |  | **20%** |
| Did not answer because of unemployment status |  | **0%** |  | **2%** |  | **15%** |  | **9%** |

\*T – Target, A – Achievement

The results for the W, X, Y, and Z programmes, respectively, showed approximately 79%, 58%, 52%, and 71%, of graduates engaged in business opportunities and R&D activities. In terms of PEO3, the graduates have successfully participated in entrepreneurship activities that apply engineering knowledge and technical skills and show that they do not just work without engaging in any activity. Overall, PEO3 successfully achieved more than 30% achievement target.

**3.1.4 PEO4: Engaging in activities to enhance knowledge for successful career advancement**

PEO4 is an activity to enhance knowledge for successful career advancement. PEO4 describes the future achievement of the graduates. The graduates have the opportunities to further their studies to a higher level such as advanced diploma, degree, master or PhD. Graduates can also upgrade their knowledge by attaining professional certification. For career advancement criteria, the graduates are expected to hold senior positions such as senior technician, project manager consultant and supervisor. As presented in Table 3.5, the result indicated percentage achievement of PEO4 for four programmes is more than 80% achievement.

**Table 3.5** Percentage achievement of PEO4 for four programmes

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PEO**  **CURRICULUM**  **JUNE 2019** | **Analysis PEO** | **Achievement (%)** | | | | |  | | |
| **W** | | **X** | | **Y** |  | **Z** | |
| **T** | **A** | **T** | **A** | **T** | **A** | **T** | **A** |
| **PEO4**  Engaging in activities to  enhance knowledge for successful career advancement | Further study, self- employed, holding a senior position post and salary increment, involve in technical project or involve in R&D and upgrade technical knowledge | **>30%** | **100%** | **>30%** | **98%** | **>30%** | **85%** | **>30%** | **91%** |
| Not achieved |  | **0%** |  | **2%** |  | **15%** |  | **9%** |

\*T – Target, A – Achievement

Based on collected data, 85% of graduates from Y programme achieve PEO4, which is either further study, self-employed, holding a senior position post and salary increment, involved in technical projects or involved in R&D and upgrading technical knowledge. Indeed, the graduates recognized the importance of engaging in activities to enhance knowledge for successful career advancement when averaged above 91-100% from W, X, and Z programmes indicated that they are satisfactorily achieved by the batch 2016 and 2017 alumni within 3 years of graduating date. According to the data collected, the majority of working graduates receive a salary increment after three years of employment, while the rest get a promotion and get a better job.

4.0 DISCUSSION AND CONCLUSION

A survey of PEO (PEO1-PEO4) achievements for polytechnic programs offered at polytechnics was provided to graduates who have completed in 2016 and 2017. This data was taken in 2020 by graduates of the XX, (Isikan nama institusi) for the (Isikan nama program) W, X, Y and Z programs. The results of the analysis were compared to the department's KPI determined from the pilot test against the graduates in the June 2019 session. For verification, data triangulation is performed in conjunction with the industry advisory panel for each program to obtain the PEO related industry feedback.

The analysis found that PEO1 - practicing technician in the (Isikan nama bidang program) related field meets department KPIs of more than 50% except for XXX 33% and XXX 48% programs, due to the percentage of graduates who continue their studies and who work not in the field. All respondents agreed and supported the 50% setting for PEO1 achievement.

Through the analysis of PEO2 - contributing to society with professional ethics and responsibilities found that the entire program had reached a departmental KPI percentage of over 50%. High percentage contributions to all four programs indicate that graduates are contributing to society with professional ethics and responsibilities. Respondents also suggested that in order to further strengthen the preparation of graduates to the world of industry, they should be given exposure to the form or format of industry reports as the initial preparation of students in preparing reports, especially in English reports. Additionally, graduates should have information about the professional body path and the opportunity to obtain a professional certificate through their respective fields.

PEO3 - engaging in enterprising activities that apply engineering knowledge and technical skills shows that the department's KPI setting is only 30% due to the characteristics of this PEO3 more to involve graduates in entrepreneurial or R&D activities in the industry. Analytical data shows that all programs have reached that percentage target.

Engaging in activities to enhance knowledge for successful career advancement of PEO4 shows that the data analysis results have met the department's KPI requirements of over 30%. The industry is in dire need of graduates who have best communication skills between students and other industry networking such as contractor, consultant, and client as added value to them in promotion. In addition, the importance of good work ethic and proper procedure should be applied to the student. They also need to be interested in the latest technology and installation.

5.0 CONCLUSION

It is hoped that this report for W, Y, X and Z programmes, Politeknik/ Kolej Komuniti (sila isikan nama institusi) in 2016 and 2017 (sila isikan batch graduan) will contribute towards improving quality in education and training in Polytechnic/ Community College Malaysia as well as strengthening the planning of polytechnic/ community college studies programmes in the future.

6.0 REFERENCES

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