# Analysis of The Implementation of Industry-Academia Programme For Diploma In Civil Engineering Students at Politeknik Sultan Haji Ahmad Shah Towards Developing Holistic Graduates

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## Abstract

**Introduction/Main Objectives:** This study aims to examine the effectiveness of the Industrial Visiting Lecturer Programme (PPI) for the Diploma in Civil Engineering (DKA) at Politeknik Sultan Haji Ahmad Shah (POLISAS) in producing holistic graduates.

**Background Problems:** The study was conducted based on the PPI activities for the June 2022 Session involving the Diploma in Civil Engineering Programme. A total of 446 DKA students participated in the PPI programme and were selected as respondents. Five main programmes were implemented for semester two(2) until semester five (5).

**Research Methods:** The research employed a quantitative descriptive design. The instrument used was a questionnaire based on a Likert scale ranging from 1 to 5, representing poor to excellent. The questionnaire was developed by the Department of Polytechnic and Community College Education (JPPKK) and the data was analyzed using Statistical Package for the Social Sciences (SPSS) version 19.0. The analysis involved median and standard deviation values. The validity and reliability of the instrument were assessed using Cronbach Alpha.

**Finding/Results:** Data were analysed using mean and standard deviation. The findings indicate that all items recorded median values between 4.1 and 4.4, reflecting a high level of satisfaction. The standard deviation value was low (0.7), indicating consistency in the respondents' responses. The Cronbach Alpha value was 0.910, indicating high reliability of the instrument.

**Conclusion:** In conclusion, the study proves that industrial exposure directly contributes to students' academic development, character building, and employability — which are dominant attributes in producing holistic graduates

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**Keywords:** Industrial Visiting Lecturer Programme (PPI), Diploma in Civil Engineering, Polisas, holistic graduates.

## Introduction

The Polytechnic and Community College Department Strategic Plan (2022–2025) emphasises the importance of industry-oriented programme implementation as an effort to improve the quality of TVET graduates. This initiative aligns with the Malaysian Education Development Blueprint (Higher Education) 2015–2025 which outlines holistic graduate development as one of the ten transformational shifts. A holistic graduate is defined as one with relevant technical knowledge and skills, critical and creative thinking, strong ethics and morality, leadership, patriotism, language and communication mastery, as well as cultural and civilisation literacy.

However, the issue of mismatch between graduate output and industry needs continues to be reported when employers state that many graduates remain insufficiently competent in terms of knowledge, skills and attitude. This misalignment becomes more challenging to address due to the rapidly changing labour ecosystem influenced by technological advancement and transitions in workforce requirements.

To close this gap, the JPPKK Strategic Plan (2022–2025) proposes five graduate transformation approaches, including industry collaboration in curriculum development as well as academic activity execution, to strengthen experience-based learning and enhance student employability.

Therefore, the implementation of the Industrial Visiting Lecturer Programme (PPI) for Diploma in Civil Engineering students at POLISAS is expected to serve as an important medium in integrating theory and practice through direct professional knowledge transfer. This initiative also supports ETAC (2020) which outlines industry involvement as a compulsory component for curriculum development to reinforce learning outcomes and enhance graduate employability. Through this programme, students are able to strengthen technical applicability, improve professional communication and build industry networks — core attributes of holistic graduate identity.

The objective of this study is to determine the dominant attributes that contribute to the formation of holistic graduates through industry lecturer participation among Diploma in Civil Engineering students at POLISAS. In addition, this research aims to assess the effects of industry engagement activities on student character, skills development and employability empowerment. The study also analyses the relationship between dominant attributes and programme effectiveness in producing holistic graduates.

Based on these objectives, several research questions were formulated to guide the investigation. Corresponding hypotheses were developed to enable empirical testing on the relationship between dominant attributes and the impact of industry exposure on student development. This methodological approach supports structured and robust research execution.

Yassin (2014) highlighted that human capital development should be implemented strategically to produce knowledgeable and highly skilled workforce with balanced moral character. Holistic development is not limited to technical skills but involves personality shaping, critical reasoning and ethical maturity. Ahmad Nabil (2012) stressed that industry evaluates workers based on technological competency and employability skills, while Ahmad Rizal et al. (2008) reported employability failure arises from lack of job-aligned competencies. Therefore, industrial exposure must be extensively embedded into polytechnic education to ensure students excel academically while possessing relevant human skills.

Studies by Zaliza Hanapi & Arasinah Kamis (2017) also showed a skills mismatch between technical and employability competencies among community college graduates leading to unemployment among technical graduates.

# Research Methods

### Research Design

This study employed a descriptive quantitative research design because it aimed to assess students' perceptions regarding the impact of the Industrial Visiting Lecturer Programme (PPI) on the attributes of holistic graduate formation. Quantitative research was chosen because it allows data to be collected systematically using questionnaire instruments and analysed using mean score and standard deviation statistics.

### Population and Study Sample

The study population consisted of students who participated in PPI programmes/activities with industry lecturers at the institution. Purposive sampling was used because only students involved in the programme were selected as respondents. The sample size was based on the total respondents recorded in the research dataset, which was 446 students consisting of semester 2 until semester 5. The sample was sufficient to represent the overall population because it included students who were directly involved in programme implementation (Krejcie, R.V. et al., 1970).

The main instrument used was a questionnaire form based on a 1–5 Likert Scale, constructed according to the attributes of holistic graduate development. *Table 1* shows the sections contained in the questionnaire.

**Table 1 Sections in the Questionnaire**

| Section | Construct | Number of Items |
|---------|-----------|-----------------|
| **Section** A | Respondent Demoghrafics | 3 |
| **Section** B | Softskills & Communication | 4 |
| **Section** C | Leadership, Professional Networking & Ability to collaborate with industry | 4 |

Source: Author's Data, 2025

**Table 2  Demografic Profile**

| Questions | Variables |
|-----------|-----------|
| Gender | Male |
|  | Female |
| Semester | 2 |
|  | 3 |
|  | 4 |
|  | 5 |
| Age | 17-19 |
|  | 20-22 |
|  | 23 and above |

Source: Author's Data, 2025

The Likert scale provided five values to ensure a balanced and symmetrical assessment range. The balanced scale ensured that respondents had equal opportunity to express positive and negative perceptions, including a neutral selection if deemed appropriate. This balance helps minimise response bias and increases data reliability (Boone & Boone, 2020). Table 3 shows the Likert measurement scale.

**Table 3 Likert Scale Measurement**

| Scale | Interpretation |
|---|---|
| 1 | Strongly Disagree |
| 2 | Disagree |
| 3 | Neutral |
| 4 | Agree |
| 5 | Strongly Agree |

Source: Author's Data, 2025

## Data Collection Process

Data collection for this study was conducted using a questionnaire distributed to respondents via two methods which was through Google Form links after the completion of industry-led programmes. Prior to answering, respondents were given a brief explanation about the purpose and objective of the study so that they clearly understood the scope and importance of their involvement. After all questionnaire forms had been completed, the data was recorded and transferred into Microsoft Excel for further analysis purposes. A data cleaning process was also conducted to ensure that no errors, missing information, or invalid responses existed that could affect data accuracy.

## Data Analysis Technique

Data were analysed using descriptive statistics through the Statistical Package for the Social Sciences (SPSS) in terms of mean, standard deviation, and construct comparison to identify the most dominant construct (Rahman & Muktadir, 2021). Mean interpretation scale:

**Table 4 Mean Intrepretation Score**

| Mean Score | Interpretation |
|---|---|
| 3,67-5.00 | High |
| 2.34-3.66 | Medium |
| 1.00-2.33 | Low |

Source: Processed Data (SPSS), 2025

## Instrument Validity and Reliability

The validity of the questionnaire was determined through Expert Review involving experienced lecturers in the fields of education and industry. Reliability was tested using Cronbach Alpha to determine the consistency level of the questionnaire items. A Cronbach Alpha value ≥ 0.80 indicates a reliable instrument (Rak & Wrześniowski, 2023).

# Result

This section presents data analysis and research findings based on the questionnaire instrument measuring the effectiveness of industry lecturer involvement in developing holistic graduates. The analysis used descriptive statistics involving mean value, standard deviation (SD), and instrument reliability (Cronbach Alpha).

**Reliability Test**

Cronbach Alpha testing was conducted on 8 questionnaire items covering two constructs. *Table 5* is the reliability analysis in SPSS table format.

**Table 5 Instrument Realiability Validity Analysis**

| Cronbach Alpha | N of items |
|---|---|
| 0.910 | 8 |

Source: Processed Data (SPSS), 2025

The value $\alpha = 0.910 > 0.80$ shows that the instrument has very high reliability, stable and consistent to be used in the study (Tomasz Rak & Szymon Wrzesniowski, 2023).

**Frequency and Percentage Distribution of Respondents by Demographic Profile**

Table 6 shows the frequency and percentage of respondents by demographic profile. This table displays the distribution across variables based on the demographic items answered by respondents.

**Table 6 Frequency and Percentage of Respondents by Demoghrafic Profile**

| No Item | Variables | Frequency | Percent (%) |
|---|---|---|---|
| Gender | Male | 205 | 45.9 |
| | Female | 241 | 54.1 |
| Semester | 2 | 115 | 25.7 |
| | 3 | 51 | 11.4 |
| | 4 | 102 | 22.9 |
| | 5 | 178 | 40 |
| Age | 17-19 | 166 | 37.2 |
| | 20-22 | 278 | 62.3 |
| | 23 and above | 2 | 0.05 |

Source: Processed Data (SPSS), 2025

A total of 446 respondents were involved in this survey. A total of 205 respondents (45.9%) were male while 241 were female (54.1%). Approximately 178 respondents (40%) were from semester 5 while 51 respondents were from semester 3 (11.4%). Overall, there were 278 respondents (62.3%) between the age of 20 to 22, and the lowest percentage was for respondents aged 23 and above (0.05%).

**Holistic Attributes Data – Soft Skills**

**Table 7 Holistic Graduate Attribute Data- Softskills**

| Item Code | Item | Mean | Std. Deviation | Intrepretation |
|---|---|---|---|---|
| S1 | Confidence in giving opinions | 4.16 | 0.66 | High |
| S2 | Sharing ideas openly | 4.20 | 0.67 | High |
| S3 | Increased motivation and creative thingking | 4.27 | 0.60 | High |
| S4 | Focused, alert and productive during the programme | 4.28 | 0.61 | High |
| | Average | 4.23 | 0.636 | |

Source: Processed Data (SPSS), 2025

Table 7 shows statistical analysis for soft-skill holistic attributes. The average mean and standard deviation values are 4.23 and 0.636.

**Holistic Attribute Data – Leadership, Professional Networking & Industrial Collaboration**

**Table 8 Holistic Graduate Attribute Data – Leadership, Professional Networking & Industrial Collaboration**

| Item Code | Item | Mean | Std. Deviation | Intrepretation |
|---|---|---|---|---|
| S5 | Understand professional responsibilities | 4.31 | 0.59 | High |
| S6 | Interaction skills with industry | 4.19 | 0.65 | High |
| S7 | Understand the importance of industry relations | 4.24 | 0.63 | High |
| S8 | Preparation for real-world employment | 4.27 | 0.63 | High |
| | Average | 4.25 | 0.625 | |

Source: Processed Data (SPSS), 2025

Table 8 shows the statistical analysis for holistic attributes related to leadership, professional networking and industrial collaboration. The average mean and standard deviation values are 4.25 and 0.625.

## Discussion

The results of the questionnaire analysis show that both holistic graduate attributes studied were at a high level. Emphasis on the involvement of industry lecturers was found to play a significant role in increasing the formation of student capability in producing holistic, entrepreneurial and balanced graduates who possess relevant technical knowledge and skills, critical and creative thinking, and strong ethics and morals (*Malaysia Education Blueprint (Higher Education), 2015–2025*).

**Soft Skills & Communication**

The results of the study show that the Soft Skills & Communication construct recorded an overall mean value of 4.23, which is at a high level. The item with the highest score was

"helping oneself become more alert, focused and productive during learning activities" with a mean of 4.28, followed by increased motivation and creative thinking (mean 4.27). This shows that the involvement of industry lecturers successfully improved students' perseverance, focus, and intellectual sharpness during the learning process.

Items related to open idea sharing (mean 4.20) and confidence in giving opinions (mean 4.16) also recorded high values, indicating improvement in students' ability to voice opinions professionally. The low standard deviation values (0.60–0.67) prove that student responses were nearly uniform, showing the industrial intervention effect on communication development was consistent and widespread.

Overall, these findings confirm that industry-exposure based programmes successfully develop students to become more confident, proactive and creative, in line with soft skill elements under the Holistic Graduate Framework (MOHE, 2015). This is also supported by findings from a study on student perceptions of the effectiveness of the Industrial Visiting Lecture Programme in TVET Higher Education (Jamaah Suud et al., 2022) which found positive gains in communication and learning motivation.

The findings also reinforce research regarding soft-skill mastery which proved that higher education institutions must provide more comprehensive exposure to soft skills to enable students to identify problems, barriers and participation that can contribute to motivational improvement and problem solving (Ong Ai Ling et al., 2020). A study on *University–Industry collaboration for academic success and employability* also showed that industry collaboration enhanced student soft skills (including communication, adaptability and work ethics) and employability outcomes (Imran Maqbool Khan et al., 2025). Local studies have also shown that soft skills such as communication and teamwork are among the key attributes required by employers in Malaysia for the development of holistic graduates (Idris Osman et al., 2022).

## Leadership, Professional Networking & Ability to Collaborate with Industry

The second construct recorded a slightly higher mean value of 4.25 compared to the first construct. The highest item was "understanding professional responsibility" with a mean score of 4.31, followed by "student readiness to enter employment" (mean 4.27). These findings show that involvement with industry lecturers not only enhances interpersonal skills, but also builds understanding of workplace ethics and real-world professional standards.

In addition, items related to understanding industrial relationships and industry interaction skills obtained mean values between 4.19–4.24, indicating respondent awareness of the importance of building professional connections and collaborative networking. The standard deviation values (0.59–0.65) suggest consistent student perceptions regarding the benefits of industry collaboration towards employability.

These findings align with the study Enhancing student employability through collaboration between universities and industry which found that university-industry partnerships help students build early professional networks, connect with industry mentors, peers and job opportunities, thereby supporting transition from student life into employment (Sangeetha Manoharan & Gurupandi Muthukkannu, 2024). Another study found that employability showed the strongest relationship with communication, leadership, critical thinking and problem solving which are highly important in holistic graduate development (Idris Osman et al., 2022).

Overall, these findings clearly show that the PPI programme nurtures student understanding of real work practices, strengthens industrial networking skills, and supports leadership and

employability readiness — aligned with TVET graduate aspirations towards balanced, competitive and future-ready individuals.

## Conclusion

In conclusion, statistical analysis proved that the involvement of industry lecturers has a positive and significant impact on the development of holistic graduates. Both constructs recorded mean scores exceeding 4.20, indicating that students not only improved communication and soft skills, but also gained awareness of professional responsibility and were better prepared to enter the workforce.

A reliability value of Alpha 0.910 confirmed that the questionnaire instrument was stable and valid for academic research. Therefore, the PPI programme has been proven to be an effective medium for strengthening holistic graduate elements, in line with TVET education agenda and the aspiration of the Ministry of Higher Education to produce high-quality, competent and competitive graduates.

For improvement, future research can apply inferential statistical tests such as T-test to obtain stronger findings. Data could also be strengthened using mixed method approaches by integrating qualitative research elements.

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