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Evaluation of the Implementation of Work-Based Learning in the Automotive Engineering Specialisation Programme at Mandiri Private Vocational School

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ABSTRACT

Field Work Practice (FWP) is essential in vocational education for connecting school-based learning with workplace experience, yet comprehensive evaluations of FWP in Automotive Engineering remain limited. This study evaluated FWP implementation in the Automotive Engineering Program at SMK Swasta Mandiri using the CIPPO (Context, Input, Process, Product, and Outcome) model. A mixed-methods sequential explanatory design was employed. The quantitative phase involved 155 Grade XII students who had completed FWP, while the qualitative phase involved 10 informants comprising one principal, one FWP Working Group head, and eight supervising teachers. Data were collected through questionnaires, interviews, observations, and documentation, and analyzed using descriptive statistics and the Miles, Huberman, and Saldaña model. Overall FWP implementation reached 82.01%, indicating a good to very good category. Context scored 85.60% (very good), input 80.66% (good), process 79.08% (good), product 80.77% (good), and outcome 83.93% (very good). Qualitative findings indicated that variations in preparation, work activities, and industry operating conditions resulted in unequal learning experiences among students. FWP was implemented well overall but requires greater standardization of learning experiences and monitoring. The findings support CIPPO as a comprehensive evaluation framework and provide practical guidance for strengthening school–industry orientation, monitoring, competency assessment, FWP site evaluation, and graduate tracer studies.

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1. INTRODUCTION

Vocational education plays a strategic role in preparing a workforce that is competent, adaptable and suited to the needs of the labour market. The advent of the Fourth Industrial Revolution, automation and digital transformation has changed the skills

requirements of the workforce, meaning that graduates need not only hard skills but also soft skills such as discipline, communication, collaboration, problem-solving and adaptability [1]. These changes are particularly relevant to the field of automotive engineering, which is currently evolving from conventional mechanical work towards the use of digital diagnostic technology, electronic control systems, data-driven maintenance, electric vehicles and safety technology. Consequently, Vocational Secondary Schools (SMKs) are required to provide education that is aligned with technological developments and the needs of the business and industrial sectors (DUDI). Bridging the Competency Gap: Preparing Vocational Automotive Education for the Electric Vehicle Era.

One form of work-based learning is the Work Placement Programme, which provides students with the opportunity to apply the skills they have learnt at school in a real-world work environment. For automotive engineering students, the internship enables them to interact directly with equipment, work procedures, technology, safety standards and industrial culture. The Merdeka Curriculum designates the FWP as a compulsory subject that links school-based learning with authentic work experience [2]. Its success depends heavily on the programme's alignment with industry needs, the availability of resources, the quality of supervision and monitoring, and the involvement of schools and industry partners.

Previous research has shown that dual-system education and work-based learning can enhance the relevance of vocational education to the needs of the labour market when supported by strong school–industry partnerships [3]. The effectiveness of work-based learning is also influenced by learners' readiness, supervision, the suitability of the placement, and monitoring [4], whilst collaboration between schools and industry is a key factor in the programme's success [5]. These findings suggest that work-based learning is a multidimensional programme influenced by conditions before, during, and after the placement. However, previous research has largely emphasised competencies or employability and has not consistently evaluated the context, resources, processes, immediate outcomes, and programme impacts simultaneously. Evaluative studies with such a scope remain limited, even though programme evaluation is necessary to identify strengths, constraints, and a basis for improving the delivery of work-based learning [6].

These limitations highlight the importance of using a more comprehensive evaluation framework. The CIPP model (Context, Input, Process, Product) enables the evaluation of programme needs and objectives, resource readiness, implementation processes, and direct outcomes. However, for work-based learning programmes, the evaluation must also consider the benefits following the programme's completion. In this study, 'product' is understood as direct outputs, such as the attainment of competencies, marks, reports or journals, and certificates, whilst 'outcome' reflects broader impacts, such as employability, career planning, professional networks, competitiveness, and the transition into the world of work. Therefore, the CIPPO model (Context, Input, Process, Product, Outcome) provides more comprehensive information as it can demonstrate whether the direct outcomes of work experience placements translate into relevant benefits for students' readiness and future prospects. The inclusion of the 'outcome' dimension is crucial because good 'product' outcomes do not automatically indicate the long-term success of a programme.

At SMK Swasta Mandiri, the Automotive Engineering Specialisation Programme's work placement is carried out over six months through partnerships with various industry and business organisations. Initial observations revealed several issues, namely: sub-optimal industry involvement in preparatory training; insufficient teacher supervision; student activity logs that were not fully organised; and a gap between some students' competencies and the demands of jobs in the industry. These conditions indicate that certain aspects of implementation require improvement. However, these initial findings do not imply that the programme as a whole has failed, as a programme may be rated as 'good' or 'very good' overall whilst still having certain indicators that are weak. Consequently, an evaluation is required to distinguish the programme's overall achievements from the areas requiring improvement.

In light of this gap, this study offers a novel approach by evaluating the automotive engineering work placement programme using the CIPPO model, which comprehensively integrates five dimensions. This approach not only assesses whether the programme is implemented and produces competencies, but also identifies whether these outcomes contribute to students' employability and their transition into the world of work. This study also employs a mixed-methods approach to integrate quantitative measurements with qualitative explanations of the factors supporting and hindering implementation.

This study aims to evaluate the implementation of the Industrial Training Programme in the Automotive Engineering Specialisation Programme at Mandiri Private Vocational School based on the five dimensions of CIPPO, namely: (1) context, the alignment of programme objectives and needs; (2) input, the readiness of resources and programme support; (3) process, the quality of delivery, guidance and monitoring; (4) product, direct outcomes in the form of competences and programme outputs; and (5) outcome, the programme's benefits in terms of employability, career planning, professional networks, competitiveness and the transition into the world of work.

This study makes three contributions. Theoretically, it expands the application of the CIPPO model in the evaluation of vocational education by distinguishing between 'products' and 'outcomes'. Methodologically, the integration of quantitative and qualitative methods results in a more comprehensive evaluation. In practical terms, the study's findings can serve as a basis for schools and industry partners to improve the planning, preparation, placement, supervision, monitoring and follow-up of work placements, as well as to strengthen the relevance of automotive engineering education to the needs of the labour market.

2. METHOD

This study is an evaluative study employing a mixed-methods approach and a sequential explanatory design, with the quantitative phase serving as the main stage, followed by a qualitative phase to explain and confirm the quantitative findings. This design was chosen because quantitative data can demonstrate the level of programme achievement, but cannot provide an in-depth explanation of the supporting factors, constraints and reasons behind such achievements. The evaluation utilised the CIPPO model (Context, Input, Process, Product, Outcome), which covers contextual suitability, resource readiness, implementation, direct outcomes and programme impact [7], [8].

The research was conducted at SMK Swasta Mandiri, Deli Serdang Regency, North Sumatra, in October 2023. The population consisted of 253 Year 12 students on the Automotive Engineering Specialisation Programme who had completed a six-month work placement; 155 students were selected as the sample using the Slovin formula at a 5 per cent error rate [9] and simple random sampling based on a list of students who met the inclusion criteria, namely having completed their work placement during the same period, whilst students who had not completed their work placement or provided incomplete data were excluded. The qualitative phase involved 10 informants selected through purposive sampling, comprising one headteacher, one chair of the Work Placement Task Force, and eight supervising teachers.

The research was conducted in five stages: a questionnaire, preliminary quantitative analysis, selection of informants based on their involvement and findings requiring clarification, interviews/observations/documentation, and integration of results. Data were collected using a five-point Likert scale questionnaire, structured interviews, observations and documentation. The questionnaire covered the five dimensions of CIPPO: context (needs and objectives), input (learners, mentors, facilities, resources and partnerships), process (preparation, implementation, mentoring, monitoring and evaluation), product (competencies and direct outputs), and outcome (employability, career, professional networks, competitiveness and labour market transition). Scores are interpreted using the Respondent Achievement Level (RAL). Content validity achieved an average Aiken's V of 0.888; item validity was tested using the Corrected Item–Total Correlation; and Cronbach's Alpha reliability ranged from 0.816 to 0.876 [10].

Quantitative data were analysed descriptively using IBM SPSS Statistics 24 and Microsoft Excel, and then categorised as 'very good', 'good', 'adequate', 'poor' and 'very poor' [11]. Qualitative data were analysed using the Miles, Huberman and Saldaña model through data reduction, data presentation, and the drawing and verification of conclusions [12]. Quantitative findings, particularly indicators with low scores or requiring further explanation, formed the basis for the focus of qualitative data collection. The two phases were then integrated during the interpretation stage to explain the outcomes and their underlying factors. Data validity was strengthened through triangulation of sources and techniques, whilst research ethics were upheld through voluntary participation, provision of information about the research, confidentiality of identity, and the use of data for academic purposes.

3. RESULTS AND DISCUSSION

3.1. Results

This section presents the results of an evaluation of the implementation of the Field Work Placement (FWP) in the Automotive Engineering Specialisation Programme at SMK Swasta Mandiri, based on the five dimensions of the CIPPO framework (Context, Input, Process, Product and Outcome). A quantitative analysis was carried out on 155 students. Prior to the analysis, six negative statements were reverse-scored so that all items had the same direction of interpretation.

3.1.1. Overall Evaluation of CIPPO Dimensions

The descriptive statistics for the five-dimensional CIPPO composite are presented in Table 1.

Table 1. Descriptive Statistics for the CIPPO Dimensions Composite

CIPPO Dimension	N	Amount of Items	Mean	SD	Minimum	Maximum	TCR (%)	Category
Context	155	10	4.280	0.743	2.10	5.00	85.60	Very Good
Input	155	7	3.366	0.415	2.00	4.00	67.32	Good
Process	155	13	3.872	0.567	2.31	4.54	77.44	Good
Product	155	6	3.383	0.394	2.33	4.00	67.66	Good
Outcome	155	4	4.197	0.928	2.00	5.00	83.94	Very Good

Source: Research data, processed following reverse scoring.

Based on Table 1, the Context dimension achieved a TCR of 85.60 per cent and falls within the ‘very good’ category. The Outcome dimension achieved a TCR of 83.94 per cent and falls within the ‘very good’ category. Meanwhile, the Process dimension achieved a TCR of 77.44 per cent, Product 67.66 per cent, and Input 67.32 per cent, all of which fall within the ‘good’ category.

3.1.2. Indicator-Level Results

An indicator-level analysis was conducted to identify variations in achievement for each item across the five CIPPO dimensions. The results of the analysis include N, Mean, SD, Minimum, Maximum, TCR, and category, as presented in Table 2.

Table 2. Descriptive Statistics at the Indicator Level for the Five CIPPO Dimensions

Dimension	Indicator	N	Mean	SD	Min	Max	TCR (%)	Category
Context	X1.1.1	155	4.510	0.942	2	5	90.19	Very Good
	X1.1.2	155	3.858	1.113	1	5	77.16	Good
	X1.1.3	155	4.484	0.963	1	5	89.68	Very Good
	X1.2.1	155	4.045	1.229	1	5	80.90	Very Good
	X1.2.2	155	3.981	1.198	1	5	79.61	Good
	X1.2.3	155	4.406	1.155	1	5	88.13	Very Good
	X1.2.4	155	4.342	1.307	1	5	86.84	Very Good
	X1.2.5	155	4.439	0.883	1	5	88.77	Very Good
	X1.3.1	155	4.200	0.871	2	5	84.00	Very Good
	X1.3.2	155	4.535	0.962	2	5	90.71	Very Good
Input	X2.1.1	155	4.484	0.678	2	5	89.68	Very Good
	$X2.1.2_r$	155	1.942	1.207	1	5	38.84	Less
	X2.1.3	155	3.535	1.180	1	5	70.71	Good
	X2.2.1	155	3.897	1.135	1	5	77.94	Good
	X2.2.2	155	4.194	0.947	1	5	83.87	Very Good
	X2.2.3	155	3.787	1.233	1	5	75.74	Good
	$X2.2.4_r$	155	1.723	1.430	1	5	34.45	Less
Process	$X3.1.1_r$	155	2.581	1.216	1	5	51.61	Enough
	X3.1.2	155	3.742	1.248	1	5	74.84	Good

Dimension	Indicator	N	Mean	SD	Min	Max	TCR (%)	Category
	X3.1.3	155	4.277	1.054	1	5	85.55	Very Good
	X3.1.4	155	4.213	1.238	1	5	84.26	Very Good
	X3.2.1	155	3.710	1.446	1	5	74.19	Good
	X3.2.2	155	4.290	1.145	1	5	85.81	Very Good
	X3.2.3	155	4.387	1.041	1	5	87.74	Very Good
	X3.2.4	155	4.290	1.279	1	5	85.81	Very Good
	X3.2.5	155	4.045	1.028	2	5	80.90	Very Good
	X3.2.6	155	4.323	1.206	1	5	86.45	Very Good
	X3.3.1	155	4.258	1.110	1	5	85.16	Very Good
	$X3.3.2_r$	155	2.884	1.081	1	5	57.68	Enough
	X3.3.3	155	3.335	1.153	1	5	66.71	Good
Product	X4.1.1	155	4.355	1.005	1	5	87.10	Very Good
	$X4.1.2_r$	155	1.677	1.151	1	5	33.55	Less
	$X4.1.3_r$	155	2.355	1.098	1	5	47.10	Enough
	X4.1.4	155	3.413	1.115	1	5	68.26	Good
	X4.1.5	155	4.077	0.990	1	5	81.55	Very Good
	X4.1.6	155	4.419	1.044	1	5	88.39	Very Good
Outcome	X5.1.1	155	4.148	1.110	2	5	82.97	Very Good
	X5.1.2	155	4.581	0.874	1	5	91.61	Very Good
	X5.1.3	155	4.026	1.222	1	5	80.52	Very Good
	X5.1.4	155	4.032	1.384	1	5	80.65	Very Good

Note: $_r$ = negative items that have undergone reverse scoring.
Source: Research data, processed following reverse scoring.

In the Context dimension, the TCR for indicators ranges from 77.16% to 90.71%, falling into the 'good' to 'very good' categories. The highest TCR value is found in X1.3.2 at 90.71%, whilst the lowest is found in X1.1.2 at 77.16%. In the Input dimension, the TCR for the indicators ranges from 34.45% to 89.68%. The highest value is found in X2.1.1 at 89.68%, whilst the lowest values are found in $X2.2.4_r$ at 34.45% and $X2.1.2_r$ at 38.84%. In the Process dimension, the TCR indicators range from 51.61% to 87.74%. The highest value is found in X3.2.3 at 87.74%, whilst the lowest values are found in $X3.1.1_r$ at 51.61% and $X3.3.2_r$ at 57.68%.

In the Product dimension, the TCR indicators range from 33.55% to 88.39%. The highest value is found in X4.1.6 at 88.39%, whilst the lowest values are found in $X4.1.2_r$ at 33.55% and $X4.1.3_r$ at 47.10%. In the Outcome dimension, all indicators fall into the 'very good' category, with TCR values ranging from 80.52 per cent to 91.61 per cent. The highest value is found in X5.1.2 at 91.61 per cent, whilst the lowest value is found in X5.1.3 at 80.52 per cent. Overall, the quantitative results indicate that Context and Outcome are the dimensions with the highest achievement, whilst Input and Product have the lowest composite scores. At the indicator level, several negative items that have undergone reverse scoring show relatively low achievement, particularly in the Input, Process and Product dimensions.

3.2. Discussion

3.2.1. Contextual Evaluation of the Field Work Programme Implementation

The evaluation results show that the context dimension achieved a TCR of 85.60 per cent and falls within the 'very good' category. This finding indicates that the objectives and direction of the Field Work Programme implementation are generally in line with the functions of vocational education, namely to provide real-world work experience and to link learning in schools with the needs of the business and industrial sectors (DUDI). This alignment is important because work-based learning places authentic workplace experience at the heart of the process of competence development and the transition of learners into the world of work [13].

This finding is consistent with that of Nasicha et al. [14], who demonstrated that the 'context' aspect in the evaluation of work placement programmes fell into the 'good' category. However, the findings of this study also provide a more specific perspective, as the context of work placements within the Automotive Engineering Vocational Programme relates not only to the general alignment between schools and industry, but also to the alignment of work experience with developments in automotive technology. In this field, the required competencies increasingly encompass electronic diagnostics, control systems, electric vehicle technology, battery systems, and the use of digital diagnostic equipment. Recent studies on vocational automotive education indicate that the transition to electric vehicles has increased the demand for competencies in high-voltage safety, battery management systems, electric motor diagnostics, and charging infrastructure [15].

Therefore, the 'excellent' context category does not necessarily mean that all students have received the same exposure to the latest automotive technology. Interview results indicate that the types of tasks assigned to students depend on the operational conditions of each partner organisation. Some students are able to gain a more varied range of experience, whilst others may be more heavily involved in routine maintenance tasks. These differences highlight an issue of equity in learning experiences that requires attention. These findings are consistent with research confirming that experience-based learning makes a significant contribution to improving the employability of vocational education graduates [16].

These findings underscore the importance of aligning the curriculum with the needs of the industry, in line with the 'link and match' principle [17]. However, such alignment should not be limited to administrative compatibility between schools and industry. Schools need to ensure that every work placement site provides a minimum level of learning exposure that is consistent with the learning outcomes for Automotive Engineering. In this way, school–industry partnerships serve not only as a means of placing students but also as a mechanism for ensuring the quality of the learning experience.

3.2.2. Evaluation of Inputs to the Implementation of the Work Placement Programme

The input dimension achieved a TCR of 80.66 per cent and fell into the 'good' category. These results indicate that students, preparatory training, and resources supporting the Field Work Programme are generally available. The preparatory training covers the administration of the Field Work Programme, work ethics, health and safety, and an

introduction to the industrial environment. This preparedness is a crucial component, as students need to possess both technical and non-technical readiness before adapting to the work environment.

This finding is consistent with Habibi et al. [18], who identified student readiness and organisational readiness as key elements in the implementation of work-based learning. The preparatory training also demonstrates efforts to link schools with industry. This supports the view that vocational education partnerships with industry can help bridge the gap between the competencies provided by schools and the demands of the workplace [19]. However, qualitative findings reveal that industry involvement in the preparatory sessions is not uniform. Not all partners provide supplementary material with the same intensity, as they adapt to their companies' operational conditions. This finding is significant as it demonstrates that the quality of programme inputs is determined not only by what the school provides but also by the capacity of each industry partner.

Thus, the results of this study reinforce the finding that strengthening partnerships is necessary in vocational education [20]. Effective partnerships need to be translated into concrete operational standards, such as joint school–industry orientation modules that cover, at a minimum, work culture, health and safety, operational standards, the technology used, and the competencies that learners must achieve. In the context of Automotive Engineering, these standards should also include an introduction to developments in vehicle technology, diagnostic equipment, and relevant safety procedures. Consequently, students will not be entirely reliant on the specific characteristics of individual companies to acquire the same minimum competencies.

3.2.3. Evaluation of the Implementation Process of the Work Placement Programme

The process dimension achieved a TCR of 79.08 per cent and fell into the 'good' category. This dimension is one of the components that scored relatively lower compared to the context and outcome dimensions. In general, students have participated in work activities, followed procedures, communicated with supervisors, and been involved in completing tasks within the industry. These findings support Ismayanti et al. [4], who emphasise the importance of the roles of supervising teachers and industry instructors in the implementation of the Field Work Programme. Supervision enables students to receive guidance when facing both technical and non-technical issues. The research results are also consistent with the concept of work-based learning, which positions direct involvement in the work environment as a means of developing vocational competences [21].

Nevertheless, the findings of this study need to be interpreted with caution. The available data indicate that monitoring has taken place, but this study did not objectively measure the frequency of visits, the duration of monitoring, the quality of feedback, or the follow-up actions taken after each visit. Therefore, these findings are not yet sufficient to conclude that the monitoring mechanism has been proven effective. A more accurate statement is that monitoring has become an integral part of the FWP implementation mechanism.

A more significant issue arises from the variation in work activities amongst partners. Trainees do not always undertake the same type of work, as the company's operational

conditions heavily influence activities. In the automotive sector, these conditions have the potential to result in greater disparities in learning experiences compared to vocational fields where work is relatively more uniform. Trainees at workshops or companies with digital diagnostic facilities and the latest vehicle technology may gain different experiences from those who spend more time carrying out routine servicing tasks.

Consequently, the success of the work placement process cannot be assessed solely on whether trainees are present and carrying out tasks, but also on the quality and relevance of the work they perform in relation to the targeted competencies. Findings regarding communication, collaboration and problem-solving skills are also consistent with the World Economic Forum [22], which identifies these competencies as essential skills in the world of work. However, these competencies must be ensured through carefully designed and monitored work activities, rather than being assumed to develop simply because students are placed within the industry.

3.2.4. Evaluation of the 'Product' Dimension of the Field Work Programme Implementation

The 'product' dimension achieved a TCR of 80.77 per cent and was classified as 'good'. This finding indicates that the direct outputs of the field work programme have been assessed positively by the students. These outputs include the completion of tasks, the application of work procedures, the preparation of reports, and fieldwork certificates.

However, the term 'product' must be clearly distinguished from 'outcome'. In this study, 'product' is more accurately understood as the direct results of the programme, such as the attainment of the competencies being trained, the completion of work, reports, and certificates. Meanwhile, 'outcome' relates to broader and more sustainable benefits, such as career readiness, professional networks, and opportunities for transition into the world of work.

Therefore, the statement that the Field Work Programme "enhances competencies" needs to be qualified. This study utilised students' perceptions and qualitative data to evaluate programme outcomes, but did not employ pre-test–post-test assessments, direct competency tests, or a control group. Consequently, the findings indicate that students perceive an improvement in their competencies and have gained opportunities to apply these competencies within the industry; however, they do not yet demonstrate a causal increase in competencies.

These findings are consistent with those of Hindarto et al. [23], who demonstrated a positive relationship between the implementation of work placements, mastery of competencies, and the development of a work ethic. However, the study by Cahyadi et al [24], on school–industry partnerships in the Light Vehicle Engineering programme showed that the 'product' component was actually the lowest-scoring component, even though the programme as a whole was categorised as 'good'. This discrepancy suggests that success in context and process does not necessarily automatically result in the same level of product achievement across every programme.

In the context of this study, the 'product' component can be strengthened by using a competency rubric developed jointly by schools and industry. This rubric needs to

distinguish between attendance, completion of tasks, and the actual mastery of technical competencies. Continuous evaluation, as recommended by Septian et al. [25], is also necessary to ensure that the outcomes of the FWP remain relevant to changes in automotive technology.

3.2.5. Outcome Evaluation of the Field Work Programme Implementation

The outcome dimension achieved a TCR of 83.93 per cent and fell into the 'very good' category. This finding indicates that students perceived the benefits of the field work programme in terms of work experience and career orientation. Interview results showed that some students had the opportunity to interact with professionals, build relationships, and obtain information regarding job opportunities and career development.

These findings are consistent with those of Adristy and Rozi [26], who demonstrated that work placement experience is linked to employability through work experience, adaptability, and an understanding of job requirements. These results also support Aprianto [27], who emphasised that the success of vocational education is determined not only by academic achievement but also by graduates' ability to adapt and compete in the world of work.

Nevertheless, the very positive outcomes in this study should not be interpreted as evidence that work placements have increased actual employment rates. This study has not tracked graduates' employment status, the time taken to find work, the alignment of their jobs with the automotive sector, or career continuity. Therefore, the outcomes are more accurately interpreted as perceptions of the benefits regarding career readiness and the formation of professional networks, rather than as evidence of long-term impact [19].

From this perspective, the addition of the 'outcome' dimension provides information that would not be obtained if the evaluation were limited to the conventional CIPP framework. Learners may complete their work and obtain a certificate as a 'product', but a separate question is whether that experience results in career readiness, networking opportunities, and opportunities for transition into the world of work. Therefore, 'product' and 'outcome' should not be treated as synonymous concepts.

3.2.6. Synthesis of Findings and Discrepancies between Baseline Conditions and Evaluation Scores

One of the key findings of this study is the tension between the initial observation results and the aggregate evaluation results. At the initial stage, several issues were identified, such as sub-optimal industry involvement in training, insufficient monitoring of teachers, incomplete activity logs, and competency gaps. However, the quantitative results indicate that all dimensions fall within the 'good' or 'very good' categories.

These discrepancies do not necessarily indicate data inconsistency. One possible explanation is that the problems identified in the initial stage may have only arisen in specific indicators and were not significant enough to lower the overall score for a given dimension. Consequently, the aggregate score may appear high despite the presence of certain specific shortcomings.

Another possibility is social desirability bias. As pupils were evaluating a programme run by the school and involving their teachers, the possibility that they might have given more positive responses cannot be entirely ruled out. This limitation is an important reason not to interpret quantitative scores as the sole evidence of the programme's success.

This is where the integration of mixed-methods research becomes crucial. Quantitative data indicate overall levels of achievement, whilst interviews, observations and documentation help to explain the circumstances underlying those scores. Consequently, the research findings should be understood as indicating that, on the whole, the programme is performing well, but that there are still variations and weaknesses in certain aspects of its implementation.

3.2.7. Implications for Equity in Learning Experiences

The finding that students' work activities vary according to the operational conditions of partner organisations has broader implications for the quality of work-based learning. When facilities, technology, types of work and the intensity of supervision differ between companies, students may potentially receive unequal learning experiences despite participating in programmes of the same duration.

This issue is particularly relevant to Automotive Engineering due to the rapid pace of technological development. A study by Nursyafti et al [15] shows that vocational automotive education faces a skills gap relating to electric vehicles, including high-voltage safety, battery management, electric motor diagnostics, and charging facilities. Therefore, schools need to ensure that students placed with partners with limited technology still receive additional experience or training to meet minimum competency standards.

These findings also reinforce the importance of industry supervision. Research on supervised work experience indicates that such experience is associated with higher levels of employability skills and emphasises the importance of supervision by experts [28]. Thus, standardisation does not mean that all students must perform identical tasks, but rather that all students need to achieve the same minimum competency standards through relevant work experience.

3.2.8. Practical and Policy Implications

Based on these findings, programme improvements should be directed towards indicators that still show weaknesses, rather than merely at enhancing partnerships in general. Firstly, schools and industry need to standardise the pre-work placement orientation modules used jointly. Secondly, a minimum frequency for teacher monitoring and a mechanism for documenting follow-up actions need to be established. Thirdly, schools could utilise digital work placement journals to enable more systematic monitoring of students' activities. Fourthly, a joint school–industry competency rubric needs to be developed to assess technical and non-technical competencies.

Fifthly, each work placement location needs to be evaluated periodically based on facilities, technology, workplace safety, variety of tasks, and the quality of supervision. Sixthly, schools need to conduct tracer studies to determine the long-term benefits of work placements on graduates' transition into the world of work. The policy implications differ

from the interpretation of the results. If the interpretation indicates that the programme, taken as a whole, has performed well, then the practical implication is how to maintain these achievements whilst reducing variations in quality between work placement locations.

3.2.9. Theoretical and Methodological Contributions

Theoretically, this study expands the application of the CIPPO evaluation framework by distinguishing between immediate outcomes (products) and long-term benefits (outcomes). This distinction ensures that the evaluation of work-based learning does not stop at the question of whether learners complete the programme and achieve immediate outcomes, but also considers whether the experience provides benefits in terms of career readiness and learners' connections with the world of work.

Methodologically, the use of sequential explanatory mixed methods allows quantitative results to be explained through qualitative data. Input and process scores, for example, become more meaningful when linked to findings regarding inconsistencies in preparation, variations in work activities, monitoring, and the conditions of industry partners. Thus, the mixed-methods approach functions not merely as a combination of two data collection techniques, but as a mechanism for explaining why certain quantitative patterns emerge.

3.2.10. Limitations of the Study and Directions for Future Research

This study has several limitations. Firstly, the study was conducted at only one vocational school, so the transferability of the findings to other schools remains limited. Secondly, the quantitative data were primarily derived from self-report questionnaires completed by students, so the possibility of perceptual bias and social desirability remains. Thirdly, the representation of industry supervisors was still limited, so the industry perspective is not yet fully balanced with the perspectives of the school and the students.

Fourthly, the study did not employ pre- and post-work placement competency assessments; consequently, claims regarding competency improvement cannot be confirmed causally. Fifthly, the study did not utilise a control group or a comparison group. Sixthly, the outcome data do not yet include long-term information regarding graduates' employment status, time taken to find work, the alignment of their jobs with the automotive sector, and career progression. Future research could employ a longitudinal or pre-test–post-test design, involve several schools and a greater number of industry partners, incorporate direct assessments by industry supervisors, and integrate tracer study data. Research could also compare students based on the characteristics of their work placement locations to determine whether variations in industrial facilities and technology result in differences in competency attainment.

Overall, the CIPPO evaluation indicates that the implementation of the Work-Based Learning (WBL) programme within the Automotive Engineering Specialisation Programme at SMK Swasta Mandiri is, on the whole, in the 'good' to 'very good' category; however, this does not mean that all aspects of the programme are optimal. The 'very good' rating for context highlights the programme's fundamental relevance, whilst the 'good' ratings for inputs and outputs indicate that there is still scope to strengthen preparatory training and

ensure evidence of competency attainment. The ‘good’ rating for process also suggests that, whilst the programme is performing well, the variation in work activities and supervision highlights the need for standardisation of the learning experience. Meanwhile, the ‘very good’ rating for outcomes reflects the perceived benefits in terms of career readiness and professional networking, but cannot yet be treated as evidence of long-term employment.

Thus, the main contribution of this research is not merely to demonstrate that the work placement programme has been running well, but to highlight which aspects still need to be standardised so that the quality of the learning experience does not depend too heavily on the characteristics of individual industry partners. This is particularly important for the Automotive Engineering Programme, as technological changes, including the development of electric vehicles and digital diagnostic systems, require continuously updated work experience [15].

4. CONCLUSION

This study evaluates the implementation of the Work Placement Programme (FWP) within the Automotive Engineering Specialisation Programme at SMK Swasta Mandiri using the CIPPO model (Context, Input, Process, Product and Outcome). The results indicate that the implementation of the FWP is generally in the ‘good’ to ‘very good’ category, with the context and outcome dimensions rated as ‘very good’, whilst the input, process and product dimensions are rated as ‘good’. These findings suggest that the programme has been effective in supporting students’ work experience and career readiness. However, there is still a need for standardisation of school–industry training, strengthened monitoring and mentoring, and the harmonisation of learning experiences across industry partners.

In theory, the use of CIPPO provides a more comprehensive evaluation by distinguishing between ‘products’ as direct results and ‘outcomes’ as benefits for career readiness. In practice, these findings can serve as a basis for schools and industry to improve the management of work-based learning through joint orientation, digital monitoring, competency rubrics, evaluation of work-based learning placements, and tracer studies. This study was limited to a single school and relied partly on self-reported data; consequently, the results cannot be generalised to all vocational education institutions. Further research is recommended to conduct comparative and longitudinal studies across schools, involving industry supervisors and graduates, utilising pre- and post-work placement competency assessments, and analysing graduates’ employment outcomes following the completion of their education.

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