Evaluation of Partnership Management of Vocational Education on Vehicle Engineering Department with the Industry

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Abstract
The development of the era in the industrial revolution 4.0 has caused many changes in the sectors of life that have an impact on human activities. In order to fulfill the competency of the 21st century industrial world, humans are required to be able to compete in all fields. This adaptability is a real challenge in the world of education, especially vocational education. Vocational education must collaborate with the industrial world to continue to follow the development of the era. This study aims to assess the management of partnerships between the world of education and the industrial world. This CIPP Evaluation Research uses a mix method research model, with a concurrent triangulation strategy design. The study was conducted in April-May 2025 involving teachers, industry players and students from the light vehicle engineering department at SMK in Magetan City. The data collection method used questionnaires and interviews. The results of the study showed that the aspects of Context, Input, Process and Product received good assessments from schools and industry, only improvements were needed in the facilities and infrastructure that were still considered lacking by schools that were in accordance with industry standards, and the intensity of interaction and communication between schools and industry which was still lacking. Monitoring and evaluation from schools were still considered low intensity.

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Abstrak
Perkembangan jaman pada revolusi industri 4.0 menyebabkan terjadi banyak perubahan sektor kehidupan yang berdampak pada aktivitas manusia. Dalam rangka pemenuhan kompetensi dunia industri abad 21, maka manusia diharuskan mampu berkompetisi dalam semua bidang. Kemampuan adaptasi ini menjadi tantangan nyata dalam dunia pendidikan terutama pendidikan kejuruan. Pendidikan kejuruan harus menjalin kerjasama dengan dunia industri untuk terus mengikuti perkembangan jaman. Penelitian ini bertujuan untuk menilai manajemen kemitraan antara dunia pendidikan dengan dunia industri. Penelitian Evaluasi CIPP ini menggunakan model penelitian mix method, dengan desain concurrent triangulation strategy. Penelitian dilaksanakan bulan April-Mei 2025 dengan melibatkan guru, pelaku industri dan siswa dari jurusan teknik kendaraan ringan di SMK di kota Magetan. Metode pengumpulan data menggunakan kuisioner dan wawancara. Hasil penelitian menunjukkan aspek Contect, Input, Proses dan Produk mendapatkan penilaian Good dari sekolah dan industri, hanya saja perlu perGoodan di bagian srana dan prasarana yang dirasa masih kurang oleh sekolah yang sesuai dengan standar industri, serta intensitas interaksi dan komunikasi antara sekolah dengan industri yang masih Worse. Monitoring dan evaluasi dari sekolah dirasa masih dalam intensitas rendah.

I. INTRODUCTION

In the industrial revolution 4.0, many applications of technology began to appear which had an impact on human activities (Neumann et al., 2021). In order to fulfill the competencies of the 21st century industrial world, humans are required to be able to compete in all fields (Arifin & Setiawan, 2020). This is also in line with what was expressed by (Rahayuningsih & Muhtar, 2022) who stated that in the 21st century industry, humans are needed who are able to adapt in all things. This ability to adapt is a real challenge in the world of education, especially vocational education. In a partnership, of course, there are factors that influence, both individual and organizational factors. Data obtained from observations during student internships, obtained several notes by the industrial world regarding student performance that can affect the partnership between the world of education and the world of industry. The industry feels that students need to improve their disciplinary attitudes at work, including the ability to work flexibility, leadership, adaptation,

language and creativity. There are 9 aspects of nature needed by workers in industry 4.0, including leadership, adaptation, language skills, flexibility, critical thinking, entrepreneurship, resilience, creative and innovative, full of thought (Subramaniam et al., 2021). Some impacts of Partnership between education and industry need to be assessed periodically to ensure the quality of the partnership. Assessment can be done using evaluation techniques.

Evaluation is defined as the process of describing, obtaining, reporting, and displaying descriptive information and assessments related to the benefits and values of various objects (Stufflebeam & Coryn., 2014). Evaluation is an activity that aims to collect various types of information related to something running and working, the information obtained is then used to determine the right way out in making further decisions (Arikunto, 2018). More concisely, it is stated that educational evaluation is the process of determining the value of an education, so that the quality and results are known. Evaluation is used to assess partnerships and links & matches between schools and the industrial world.

Many aspects influence the partnership between the world of education and the world of industry. Aspects that influence the relationship between the world of education and the world of industry include internship programs, the level of professionalism of personnel, leadership, and opportunities for collaboration between graduates (Magarian & Seering, 2022). The factor of individual readiness in the world of work is also one of the determining aspects of a good relationship between the world of education and the world of industry (Shodiq & Sutiman, 2022). A good relationship between the world of education and the world of industry can also increase students' confidence in carrying out programs in the partnership such as internship programs (Li et al., 2022).

Several previous studies have explained learning evaluations that can affect partnerships between education and industry. Research (Zhu et al., 2021) explains that STEM learning can be used by education to better prepare students to enter the workforce, so that partnerships between education and industry become better. This study aims to assess, describe and describe how the partnership between education and industry in the light vehicle engineering department in Magetan.

II. METHOD

This Evaluation Research uses a mix method research model, with a concurrent triangulation strategy design, which is a research model by combining and connecting qualitative and quantitative methods in a balanced way to answer the problem formulation. In the concurrent triangulation design, two data collection methods are carried out at one stage/phase of the research and at the same research time. Data integration can be done so that researchers can collect two types of data (quantitative and qualitative or vice versa) simultaneously, in one stage of data collection and then compare them. The Evaluation Model used is the CIPP (Context, Input, Process, Product) model.

This study uses a mix method with a quantitative and qualitative approach. Quantitative using survey by questionnaire to collect data from students. Interview uses in a qualitative approach to collect data from school and industry. The research was carried out in April-May 2025. The population was the head of the expertise program, totaling four people; instructors or assistants for internships in the industry, totaling four people; and all 160 grade XI students of engineering vocational high schools in Magetan City.

The data collection method uses a questionnaire and interview. The questionnaires was prepared to reveal respondents' responses to current conditions. This response is in the form of students, schools, and industries where they carry out internships. Filling out the questionnaire was done by using Google Form. The questionnaire and interview lists was validated by asking experts whoa are university lecturers to give their opinions about the questionnaire. The r-table value of 40 respondent with the significance level of 0.001 (1%) is 0.4026. In accordance with the rules of instrument validity, if r count ≥ r table then it is considered valid. The questionnaire is valid, where r count > r table. The reliability was tested by selecting a sample consisting of 40 students. Cronbach's alpha was estimated to test the reliability of the scale, and its value was 0.9487 for the whole scale. The research design shown below.

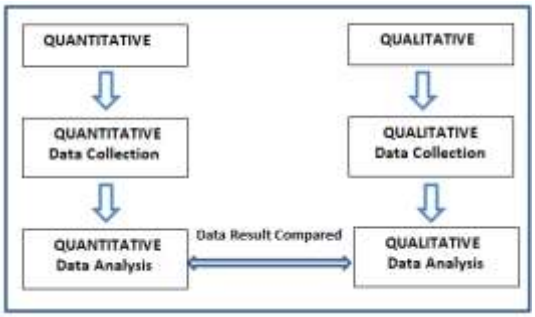

Figure 1. Research Design

In this questionnaire, using the highest score of 4 and the lowest score of 1 according to the Likert scale conversion. To find out the criteria for interpreting the ideal average score, it is necessary to find the range or interval of each criterion and the interpretation of each score. The assessment criteria are based on five categories based on the normal curve. The questionnaire assessment criteria with the ideal average interval are described in table 1.

Table 1. Evaluation Criteria

No	Score Range	Category
1	$X \geq (M_i + 1{,}5\ SD_i)$	Very Good
2	$(M_i + 0{,}5\ SD_i) < X \leq (M_i + 1{,}5\ SD_i)$	Good
3	$(M_i - 0{,}5\ SD_i) < X \leq (M_i + 0{,}5\ SD_i)$	Enough
4	$(M_i - 1{,}5\ SD_i) < X \leq (M_i - 0{,}5\ SD_i)$	Worse
5	$X < M_i - 1{,}5\ SD_i$	Bad

Source: Retnawati, H (2014:912)

III. RESULT AND DISCUSSION

A. Result

The general results of the evaluation research on partnerships between schools and industry are described in the results image below.

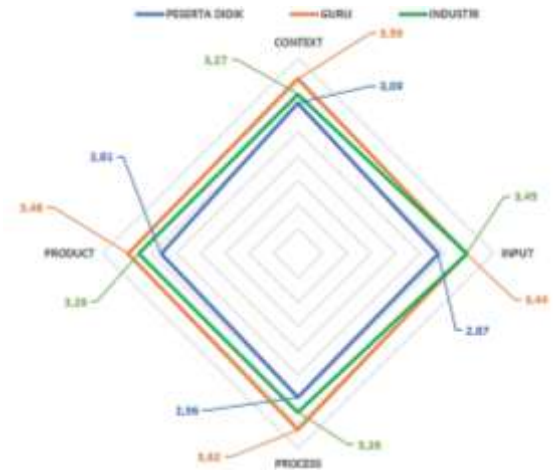

Figure 2. CIPP Evaluation Result

Figure 2 is an interpretation of the overall assessment results from the questionnaires that have been filled out by students, schools and industry. The questionnaire contains aspects of context, input, process and product to measure program evaluation. From the results of the questionnaire, differences in scores from each aspect of the assessment according to the opinions of students, schools and industry can be seen.

1. Context

Based on a questionnaire with 18 teacher respondents, the highest average score was 4 and the lowest score was 2.50. The most frequently occurring average score (mode) was 4 as many as 5 times (27.78%). The calculation results showed an average value (mean) of 3.59 and a middle value (median) of 3.58. The standard deviation of the calculated sample was 0.40.

Table 2. Frequency distribution of context aspects according to school

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	15	83,33
Good	2,75 < X ≤ 3,25	2	11,11
Enough	2,25 < X ≤ 2,75	1	5,56
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Based on the data in the table, it can be obtained that the Very Good Category has the highest percentage of 83.33% with a total frequency of 15 teachers, the Good Category has a percentage of 11.11% with a total frequency of 2 teachers. The Enough Category has a percentage of 5.56% with a total frequency of 1 teacher and the Worse and Bad Categories have a percentage of 0%.

Based on the research questionnaire that has been filled out by the industrial supervisors with a total of 14 respondents, the highest average score was 4.00 and the lowest score was 2.71. The most frequent average score (mode) is 4.00 as many as 5 times (35.72%). The calculation results show an average value (mean) of 3.26 and a middle value (median) of 2.93. The standard deviation of the calculated sample is 0.59.

Table 4. Frequency distribution of context aspects by industry

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	5	35,71
Good	2,75 < X ≤ 3,25	5	35,71
Enough	2,25 < X ≤ 2,75	4	28,58
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**14**	**100**

Based on the data in table 4, it can be obtained that the Good and Very Good categories have the highest percentage of 35.71% with a total frequency of 5. The Enough category has a percentage of 28.58% with a total frequency of 4. The Worse and Bad categories have a percentage of 0%.

2. Input

Based on the questionnaire with a total of 18 respondents as mentor teachers, the highest average score was 3.94 and the lowest score was 2.63. The most frequently occurring average score (mode) was 3.81 twice (11.11%). The calculation results showed an average value (mean) of 3.44 and a middle value (median) of 3.53. The standard deviation of the sample calculation results was 0.37.

Table 5. Frequency distribution of input aspects by school

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	12	66,67
Good	2,75 < X ≤ 3,25	5	27,77
Enough	2,25 < X ≤ 2,75	1	5,56
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Based on the data in table 5, it can be obtained that the Very Good Category has the highest percentage of 66.67% with a total frequency of 12 teachers, the Good Category has a percentage of 27.77% with a total frequency of 5 teachers. The Enough Category has a percentage of 5.56% with a total frequency of 1 teacher and the Worse and Bad Categories have a percentage of 0%.

Based on the research questionnaire that has been filled out by industrial supervisors with a total of 14 respondents, the highest average score was 4.00 and the lowest score was 2.92. The most frequent average score (mode) is 4.00 as many as 5 times (35.72%). The calculation results show an average value (mean) of 3.45 and a middle value (median) of 3.25. The standard deviation of the calculated sample is 0.44.

Table 6. Frequency distribution of input aspects by industry

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	6	42,86
Good	2,75 < X ≤ 3,25	8	57,14
Enough	2,25 < X ≤ 2,75	0	0
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Based on the data in table 6, it can be obtained that Category Good has the highest percentage of 57.14% with a total frequency of 8 respondents, Category Very Good has a percentage of 42.86% with a total frequency of 6 respondents. Category Enough, Worse and Bad have a percentage of 0%.

3. Process

Based on the questionnaire with a total of 18 respondents as mentor teachers, the highest average score was 4.00 and the lowest score was 2.67. The most frequently occurring average score (mode) was 4.00 as many as 6 times (33.34%). The calculation results showed an average value (mean) of 3.62 and a middle value (median) of 3.83. The standard deviation of the calculated sample was 0.46.

Table 7. Frequency distribution of process aspects by school

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	14	77,78
Good	2,75 < X ≤ 3,25	3	16,67
Enough	2,25 < X ≤ 2,75	1	5,55
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Table 7 explains the average value of the questionnaire results from each teacher. Based on the data in table 30, it can be obtained that the Very Good Category has the highest percentage of 77.78% with a total frequency of 14 teachers, the Good Category has a percentage of 16.67% with a total frequency of 3 teachers. The Enough Category has a percentage of 5.55% with a total frequency of 1 teacher and the Worse

and Bad Categories have a percentage of 0%.

Based on the research questionnaire that has been filled out by the industrial supervisors with a total of 14 respondents, the highest average score was 4.00 and the lowest score was 2.71. The most frequent average score (mode) is 2.88 as many as 4 times (28.57%). The calculation results show an average value (mean) of 3.26 and a middle value (median) of 2.94. The standard deviation of the sample calculation results is 0.54

Table 8. Frequency distribution of process aspects by industry

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	5	35,72
Good	2,75 < X ≤ 3,25	8	57,14
Enough	2,25 < X ≤ 2,75	1	7,14
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Based on the data in table 8, it can be obtained information that the results of the quantitative data assessment of the process aspect according to the industry's opinion get the Good Category with the highest percentage of 57.14% with a total frequency of 8 respondents, the Very Good Category has a percentage of 35.72% with a total frequency of 5 respondents. The Fair Category has a percentage of 7.14 with a total frequency of 1 respondent, the Worse and Bad Categories have a percentage of 0%.

4. Product

Based on the questionnaire with a total of 18 respondents as mentor teachers, the highest average score was 4.00 and the lowest score was 2.89. The most frequently occurring average score (mode) was 3.67, 3 times (16.67%). The calculation results showed an average value (mean) of 3.48 and a middle value (median) of 3.56. The standard deviation of the sample calculation results was 0.35.

Table 9. Frequency distribution of product aspects by school

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	5	35,72
Good	2,75 < X ≤ 3,25	8	57,14
Enough	2,25 < X ≤ 2,75	1	7,14
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Based on the data in table 49, it can be obtained that the Very Good Category has the highest percentage of 66.67% with a total frequency of 12 teachers, the Good Category has a percentage of 33.33% with a total frequency of 6 teachers. The Enough Category, Worse Category and Bad have a percentage of 0%. Based on the research questionnaire that has been filled out by the industrial supervisors with a total of 14 respondents, the highest average score was 4.00 and the lowest score was 2.71. The most frequent average score (mode) is 2.86 as many as 8 times (57.14%). The calculation results show an average value (mean) of 3.26 and a middle value (median) of 2.86. The standard deviation of the calculated sample is 0.58.

Table 10. Frequency distribution of product aspects by industry

Category	Score Range	f	(%)
Very Good	X ≥ 3,25	5	35,72
Good	2,75 < X ≤ 3,25	8	57,14
Enough	2,25 < X ≤ 2,75	1	7,14
Worse	1,75 < X ≤ 2,25	0	0
Bad	X < 1,75	0	0
Total		**18**	**100**

Based on the data in table 10, it can be obtained that the Good Category has the highest percentage of 57.14% with a total frequency of 8, the Very Good Category has a percentage of 35.72% with a total frequency of 5. The Fair Category has a percentage of 7.14 with a total frequency of 1, the Worse and Bad Categories have a percentage of 0%.

B. Discussion

1. Context

The context aspect evaluation is an initial stage evaluation, which aims to assess the quality and effectiveness of program policies & objectives and internal and external support. Data were collected through questionnaires filled out by teachers and industry as well as interviews with teachers and industry assistants. The context aspect received a Very Good score with the highest percentage. This section discusses the industrial curriculum implemented in schools.

The most prominent learning of the industrial curriculum is in the success of the internship program. For engineering students, industrial internships provide

them with early exposure and valuable experience in determining their future careers and businesses (Zhu et al., 2021). Internships can develop knowledge and skills, increase students' self-confidence and credibility (Pratibha et al., 2021). Industry and schools need to develop a special curriculum that is used in industrial class learning. Because interns come from different schools, the industry must have a standardized industrial training curriculum to make it easier for mentors to train and assess interns (Subramaniam et al., 2021).

The main agreement in the context aspect must be clearly written and valid. The black and white agreement is the main spirit that should exist in a program run by schools with industry. This written agreement can be a joint solution as a form of partnership to find the right alternative program. Good partnerships that include education & training, services, and joint research can have a significant impact on the employability of graduates (Gul et al., 2019). The results of the context assessment indicator are that there is an initial agreement to form a partnership with industry.

2. Input

The evaluation of input aspects aims to assess the quality of student readiness, school readiness and industry readiness in implementing partnership programs. At this evaluation stage, the aspects that will be seen are in terms of the readiness of facilities & infrastructure, readiness and effectiveness of industrial class learning and the readiness of schools and industries in implementing programs.

From the perspective of learning with an industrial class concept, teachers must be able to carry out learning collaboratively. Teachers need to provide a different pedagogical approach and collaborate with other teachers (Favale et al., 2020). The assessment of input aspects that have a Category Enough value can be seen in the Enoughness of facilities and practice facilities. Teachers feel that schools need to add Total facilities and tools for practice, especially to support learning. Effective learning is project-based learning by utilizing learning media (Ester et al., 2023). Learning will produce quality student products that will be used by the industry in partnership programs.

3. Process

Process evaluation aims to assess the quality and effectiveness of program implementation and monitoring & evaluation. In this aspect, the evaluation that is seen is the implementation of the program and monitoring & evaluation according to students, teachers and industry. From the results of the questionnaire assessment, the quality of program implementation and monitoring & evaluation assessments received an average score in the Good Category, although some had Very Good and Enough assessment categories. This means that the monitoring and evaluation aspects are considered effective even though there are several things that assess the monitoring and evaluation aspects as being in the Enough Category. Research by (Ricaurte et al., 2022) explains that project-based learning managed by industry has been shown to be able to provide a positive picture to interns when restrictions occur. In addition to project-based learning, it is also necessary to use learning that supports the improvement of students' soft skills such as self-confidence. The results of the study (Wang & Hsieh, 2022) show that learning using self-regulated learning has a positive impact on increasing a person's self-confidence during a career. Self-regulated learning in the context of internship preparation is a learning activity where interns try to solve their own problem situations by using various sources of information and trial and error tests (Goller et al., 2020).

The process that gets the most attention and is an important factor in determining the partnership relationship between schools and industry is the internship process. Internships need to be given maximum attention to the monitoring and evaluation process. To improve the quality of internships, it is very important to receive opinions from all stakeholders involved in the program in order to improve quality (Srivastava et al., 2019). Internship programs are usually highlighted by the lack of preparation of students in running the program, this has a direct impact on the partnership

relationship between schools and industry. The solution that can be offered is through an online or online internship program. The Virtual program or online internship is effective for information and technology programs as stated by (AlGhamdi, 2022) in his research which stated that IT majors were satisfied with the virtual internship program. This is in accordance with Permendikbud Number 50 of 2020 that online internship can be applied to expertise programs in the field of Technology and Information.

4. Product

Product evaluation is the final stage of assessment or assessment of program results. At this stage, the aspects assessed are related to the quality and effectiveness of program results as indicated by the increase in the competence of program participants and program follow-up. The results of this program are used as a benchmark for how linearly the graduates of the partnership program work according to their majors and are competent in their fields.

Research shows that there are still many graduates of the partnership program who work not in accordance with their fields. Further investigation through interviews found that the reluctance of students to work in their fields was due to various factors including the work environment being considered too harsh, lack of confidence in their abilities and the salary received not being as expected. The results of the study (Magarian & Seering, 2022) stated that the majority of engineering graduates who did not want to work in their fields were to minimize the risk of work accidents in their jobs. They tend to prefer working as entrepreneurs.

This is also in line with the opinions of several teachers. According to the results of interviews with teachers, the results of the Partnership Program were able to improve student competency and were able to foster students' entrepreneurial spirit. This means that the objectives were achieved at the end of the program in accordance with the Regulation of the Minister of Education and Culture No. 50 of 2020 concerning Field Work Practices for Students.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Based on the results of the study and discussion on the evaluation of partnerships between schools and industry, it can be concluded that the partnership program from the aspects of context, input, process and product has been running well, only that improvements are needed in the facilities and infrastructure that are still considered lacking by schools that are in accordance with industry standards, as well as the intensity of interaction and communication between schools and industry which is still poor. Monitoring and evaluation from schools are still considered low in intensity.

B. Suggestion

Based on the conclusions that have been drawn, it is necessary to carry out improvements in the aspect of adding facilities and infrastructure to meet industry standards and to communicate, monitor and evaluate partnership programs more frequently on a regular basis.

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