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The Evaluation Process of Industrial Class in Light Automotive Engineering Competencies

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Abstract

There was a technology gap between industry and vocational schools. The school curricula were not following industrial needs and the educators were lack of mastery of the latest technologies according to current industry needs. The study evaluated Mitsubishi's industrial class process on students, supervisors, business, and the industrial world (DU/DI). This research applied evaluation research with a descriptive quantitative approach. The students of XII Light Automotive Vehicle who participated in the Mitsubishi industrial class of SMK Bina Utama Kendal became the participants in this research. The research subject consisted of 34 students, ten industrial teachers, and two teachers from Mitsubishi. Then, the data instruments technique applied observation, questionnaires, and documentation. The validity test adopted Product-Moment, while the reliability test used Cronbach-Alpha. The data analysis technique applied a descriptive statistical test. The result showed Mitsubishi's industrial class process toward students was sufficient, while teachers and DU/DI were declared very high.

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INTRODUCTION

Education was the foundation in developing the potential Human Resources (HR). Through education, people can develop their abilities and skills in competing the working life. However, it was not a simple thing to get a job for graduated students since there was a gap between the knowledge and skills possessed and the needs in the work field (Ningrum, 2009). The Nawacita program that is stated in the government's vision and mission placed the quality of education, competitiveness, and national character as the main priority in national development. The program aimed to improve the quality of life and to increase productivity. This role determines competitiveness in the global market, quality, and productivity in the economic sector (Soleman & Noer, 2017).

Based on data from the Central Statistics Agency (BPS) No. 91/11/Th. XXII, 05 November 2019 the unemployment rate of graduates from Vocational High Schools (SMK) was the highest compared to graduates from other education levels. The unemployment rate of SMK graduates in August 2019 reached 10.42%. The unemployment rate was lower than the position in August 2018 of 11.24% (BPS data, 2019). Although in 2019 there was a decrease in the number of unemployed, the vocational education level was still the highest in the unemployment rate. As a school that had a brand ready for work to their graduates, this phenomenon became the antithesis. The gaps were caused by many things, including the technological gap between industry and what was taught in vocational schools, school curricula were not following industry needs, and educators who lack mastery of the latest technologies according to current industry needs. Furthermore, The lack of knowledge and skills of teachers became a massive gap that arises between the vocational world and the industrial world (Nugroho, 2016).

Vocational High Schools (SMK) refers to the curriculum that four crucial aspects must be considered, namely: (1) curriculum design refers to scientific disciplines, (2) community-oriented curriculum design, (3) student-oriented curriculum design, and (4) technology-oriented curriculum design (Wicaksono et al., 2017). The relationship between SMK and the business/ industrial world (DU/DI) had to be prepared for the relevance of cooperation (Link and Match). With the Link and Match, SMK and DU/DI were expected to reduce the gaps that occur in the field. One of the efforts to synchronize the needs of DU/DI with the readiness of SMK was to form an industrial class. The formed industrial class was expected to produce students who have competencies according to the needs of industrial standards in pairs with SMK (Suhardi, 2017).

According to Danutirta (2018), the industrial class is a collaborative program between industry and vocational education units in integrating learning in schools with the industrial world. The implementation of industrial class in SMK was a form of integrating the system in the industry with the relevant system at school. By the Regulation of the Minister of Industry Number 3 of 2017 Chapter II the learning system for vocational skills programs is adjusted to the needs of the industry, as well as in the preparation of the education curriculum for each skill program in vocational schools, competency-based training refers to the SKKNI in the industrial sector, international standards, and/or standards. The process of preparing the curriculum involves industry associations, industrial companies, and/or industrial estate companies (Kementerian Perindustrian, 2017). In this case, SMK has a great opportunity in establishing cooperative relationships with the industry. The wider collaborations carried out by SMK with industry mean the wider opportunity to reduce unemployment. Furthermore, graduate SMK students have competencies according to industry needs.

SMK Bina Utama Kendal is one of the largest private schools in Kendal with 1643 students. The expertise competencies include Light Automotive Engineering, Motorcycle Engineering and Business, Automotive Body Engineering, Network Engineering, and Software Engineering. In Light Automotive Engineering (TKRO) expertise became the favorite department with the highest number of groups compared to other majors. In 2019/2020, eleven grades of TKRO achieved six groups/classes. TKRO's expertise created a collaboration with DU/DI by creating a Mitsubishi industrial class

program. The Mitsubishi industrial program was started from the beginning of entering class X. Some students faced problems such as changing majors for various reasons such as not being comfortable with friends, being less pleased with the teacher, joining friends, and others. The absorption in the Mitsubishi Industry was low. This result needed an evaluation. Mitsubishi industrial class was expected to prepare the competent students. So that the graduates of the Mitsubishi industrial class can be occupied more optimally.

Table 1. the Distribution and Employment of TKRO Competencies BKK SMK Bina Utama Kendal 2018-2020

No	DU/DI	2018-2019			2019-2020		
		Distribution Total	Competencies Total	Score (%)	Distribution Total	Competencies Total	Score (%)
1	Automotive Industry	53	53	34.87	15	15	16.85
2	Non-Automotive Industry	99	99	65.13	74	74	83.15
	Jumlah	152	152	100	89	89	100

Source: SMK Bina Utama Kendal (2021)

Based on the table above, the distribution and employment in the automotive industry in 2019-2020 was 16.85% or decreased. It was compared to 2018-2019 that achieved 34.87%, the distribution and employment of SMK Bina Utama Kendal students in the automotive industry was still less than 50%. So it is necessary to evaluate the Mitsubishi Industrial class that has been running so far.

From the five aspects of the CIPPO parameters, the researchers evaluated the process of the industrial class aspects. It is needed since the learning process has not been carried out optimally, and skills assessments became a priority over knowledge and attitude assessments (Purnawan et al., 2017). Based on observations on the competence of Light Automotive Engineering at SMK Bina Utama Kendal, the industrial class component included aspects of the practicum/service/production scheduling process, student or participant participation, and assessment. Teachers, DU/DI, and industrial class students became participants of Mitsubishi's industrial class program. Furthermore, the parameter evaluation variable for Mitsubishi's industrial class program were student aspects, productive subject teachers, supervising teachers, and DU/DI (Bhakti, 2017). The results of the Mitsubishi industrial class program were recommended based on the evaluation results.

Based on the research background about the Evaluation Process of Industrial Class in Light Automotive Vehicle Engineering at SMK Bina Utama Kendal, it is expected to provide enlightenment as a solution to increase job absorption in industry, especially for TKRO competency graduates at SMK Bina Utama and all SMK in throughout Indonesia.

METHODS

This research method used a descriptive quantitative research approach. This research was evaluation research with the type of Process research. The study aimed to evaluate the implementation process of the Mitsubishi industrial class in Light Automotive Engineering at SMK Bina Utama Kendal. The research population was all students of XII Light Automotive Engineering at Mitsubishi industrial class. The subject consisted of 34 students who had collaborated with the Mitsubishi industrial class. The sample of industrial class supervisors was ten teachers and two participants from DU/DI. The object of this research was the implementation process of the Mitsubishi industrial class in Light Automotive Engineering at SMK Bina Utama Kendal.

The researcher observed the scheduling of practicum/service/production, participation of

students or participants, and the student assessment process. Each respondent was asked to rate the indicators in the process component in the practice of the Mitsubishi industrial class. The questionnaire contains a list of questions posed to respondents. The Likert scale was adopted to determine the score of respondents' answers in the primary data. The answers to each instrument item have a sequence from strongly agree, agree, undecided, disagree, and strongly disagree. The documents collected in this study consisted of 1) MoU documents between SMK and DU/DI, 2) Synchronization curriculum documents between SMK with DU/DI, and 3) Supported documents such as the results of data collection photos in the workshop, documentation on practicum/service scheduling/service/production, students participation, and the assessment process.

The validity test was carried out on the questionnaire. In this study, the validity test uses a content validity test (Content Validity). The validity test used the Statistical Package for the Social Science (SPSS) program with Product-Moment analysis. If the result of the calculation of r product moment $r_{xy}\geq$ 0,3, the norm was considered the item as valid (Azwar, 2016). The questionnaire was tested by using a reliability test. Furthermore, the reliability test applied the Statistical Package for the Social Science (SPSS) program with Cronbach-Alpha analysis. If $r11 >$ reliability coefficient = 0,5 (Khumaedi, 2012) then reliable or the questionnaire can be used, but otherwise, the questionnaire cannot be adopted.

The data analysis test used descriptive statistical tests. The questionnaire analysis technique method in this study employed mean analysis. The mean analysis was done by calculating the average of each instrument item. Furthermore, the mean of this instrument was averaged and became the aspect average. The average aspect was calculated as the average of the questionnaire for the process components, the calculation using statistical software SPSS ver.23. The count of the score obtained in this aspect of the process can use the formula, below:

$$X = \frac{Average\ number\ of\ instruments}{Number\ of\ question\ items}$$

The average value results in each aspect were compared with the process aspect to obtain the types of criteria. The criteria calculation of the score used the basis of calculation (Azwar, 2016) with the five categories in this study Very Low, Low, Enough, High, and Very High. One statement item has a maximum score of 5 and a minimum mark of 1. The assessment criteria specified are 5, the range of categories was divided based on the criteria formula in Table 2 below:

Table 2. The Score of Descriptive Criteria

Formula	Mean	Classification
$X > X_i + 1.8 \times sb_i$	4.2-5	Very High
$X_i + 0.8 \times sb_i < X \leq X_i + 1.8 \times sb_i$	3.4-4.2	High
$X_i - 0.8 \times sb_i < X \leq X_i + 0.8 \times sb_i$	2.6-3.4	Enough
$X_i - 1.8 \times sb_i < X \leq X_i - 0.8 \times sb_i$	1.8-2.6	Low
$X \leq X_i - 1.8 \times sb_i$	1-1.8	Very Low

The calculation of the formula and the average score used the following score range:
Highest score = 5
Lowest score =1
Range = 5-1 = 4
Interval = 4/5 = 0,8
1 – 1,8 = very low
1,8 – 2,6 = low
2,6 – 3,4 = enough
3,4 – 4,2 = high
4,2 – 5 = very high

The score was obtained as described in the form of a narrative. The description of the data was arranged logically and systematically to produce data that was easy to understand and makes it easier for researchers to combine and string together related to phenomena that occur in the object of research.

RESULTS AND DISCUSSION

Evaluation of the Mitsubishi Industrial Class Process for Students

The overall evaluation of the Mitsubishi industrial class process for students has an average score of 2.89 with a sufficient classification, bellow:

Table 3. The Evaluation Score Criteria of Mitsubishi Industrial Class for Students

Classifications	Mean	Total	Percentage (%)
Very High	4.2-5	1	2.9
High	3.4-4.2	2	5.9
Enough	2.6-3.4	23	67.6
Low	1.8-2.6	7	20.6
Very Low	1-1.8	1	2.9
Total		34	100.0

Source: Processed primary data (2021)

Based on table 3 describes the process of the Mitsubishi industrial class based on the overall student responses. According to the students, the Mitsubishi industrial class process was easy to understand. There were some categories such as low, high, very high, and very low classifications. Overall, the students assessed the Mitsubishi industrial class process declared quite effective. However, the results showed that industrial class in students aspect achieved adequate results. So it was necessary to improve the Mitsubishi industrial class for students with indicators of practicum/service/product scheduling, student participation/student participation, and student activity.

With adequate classification results in the indicator process, it assumed it was necessary to improve students' Mitsubishi industrial class with indicators for scheduling practicum/services/products, student participation/student participation, and student activity. Darma's research (2019) showed that the implementation of teaching programs in the Mechanical Engineering Department of PNB seen from the linkage of CIPP components was quite effective. However, there were low categories of student responses on the indicators of student activity. It happened because students lacked motivation, did not finish the questions given by DU/DI, and the material was difficult. Overall, students assessed the Mitsubishi industrial class process with a sufficient category or declared quite effective.

The results of this study were in line with Hurmaini & Abdillah (2015) about evaluating the process of the program. Furthermore, the lack of relevant activities and the realization of the program. The program could be continued with some improvements and revisions in its implementation. Kisniantoro et al., (2019) showed the evaluation of the BKK performance process was quite good. The results of this study were the same as the results of Diana et al research (2019). Diana et al., (2019) explained that training evaluations result had succeeded in increasing students' ability in using analytical features with a Mean value of 3.63 and SEM 0.1. This improvement was supported by instructor ability, responsiveness, and the training content by an average score was above 0 (on a scale of 1-5). The results of Rooholamini et al., (2017) showed evaluation process, the quality of the presentation of the integrated module, and Early Clinical Exposure (ECE) were good from the student's point of view. Salam & Soenarto (2013) elaborated on the evaluation process. The result showed students assessed the process with 94.71 scores or declared as good category. Iswari & Utomo (2017) elaborated 48% of the students in Adiwiyata school had a high level of knowledge, 99% of students had good attitudes towards the environment, and 79% of students had good actions towards the environment.

Evaluation of the Mitsubishi Industrial Class Process for the Supervisor Teachers

Based on the results of the questionnaire data analysis for the evaluation of the Mitsubishi industrial class process for the supervisor

teachers, the overall data obtained an average score of 3.7 with a high classification as follows:

Table 4. The Evaluation Score Criteria of Mitsubishi Industrial Class for Teachers

Classifications	Mean	Total	Score (%)
Very High	4.2-5	0	0.0
High	3.4-4.2	8	80.0
Enough	2.6-3.4	2	20.0
Low	1.8-2.6	0	0.0
Very Low	1-1.8	0	0.0
Total		10	100.0

Source: Processed primary data (2021)

Based on table 4, the process of Mitsubishi's industrial class was based on the overall response of the teachers. According to the teachers, the Mitsubishi industrial class achieved a significantly high classification or declared very effective. However, there were sufficient classifications. With high classification results for all indicators in the Mitsubishi industrial class for the teachers, it was necessary to maintain it with some indicators such as practicum/service/production scheduling, learning planning, learning services, assessment of the supervisor teacher, list of grades, and graduation procedures.

Overall, the teacher assessed the process of the Mitsubishi industrial class with a high mark or declared it very effective. With high classification results for all indicators of the Mitsubishi industrial class process for the teacher, it was necessary to maintain the Mitsubishi industrial class for the teachers with some indicators such as practicum/service/production scheduling, learning planning, learning services, assessment of the supervisor teacher, list of grades, and graduation procedures. Abdullah et al., (2016) explained the process dimensions of implementing School-Based Assessment (SBA) with teaching experience had advantages. It caused Malaysia's goal to create world-class human resources to become feasible. This research made a new contribution to teachers in Malaysia to implement SBA effectively through training, courses, monitoring, and ongoing support from the Ministry of Education.

These results were in line with Salam & Soenarto's (2013). The teachers assessed the process evaluation with a score of 70.86 or included it as a good category. Sunnah & Sukoco (2014) observed the implementation of the SEAMOLEC program in DIY in terms of the process aspect. The time implementation and interaction between students and teachers were stated in the very high category. The study results were different from the research of Rahmawati et al., (2016) where the assessment program based on the implementing steps included as sufficient categories. Tarmidi et al., (2020) explained Saraswati Vocational School Curriculum had collaborated with the industry. The implementation of the internship program had well carried out. It was just that the monitoring of supervising teachers needs to be improved.

Evaluation of Mitsubishi's Industrial Class Process in DU/DI

Based on the questionnaire data analysis result, the overall data obtained an average of 4.4 with a very high classification as follows:

Table 5. The Evaluation Score Criteria of Mitsubishi Industrial Class for DU/DI

Classifications	Mean	Total	Score (%)
Very High	4.2-5	1	50.0
High	3.4-4.2	1	50.0
Enough	2.6-3.4	0	0.0
Low	1.8-2.6	0	0.0
Very Low	1-1.8	0	0.0
Total		2	100.0

Source: Processed primary data (2021)

Table 5 elaborated the process of Mitsubishi's industrial class based on DU/DI responses. According to DU/DI, the process of Mitsubishi's industrial class was a very high classification or meant very effective. With very high classification results, it was necessary to maintain Mitsubishi industrial class in DU/DI with practicum/service/production scheduling indicators, training, learning services, DU/DI assessment, list of values, and graduation procedures.

According to DU/DI, the process of Mitsubishi's industrial class was already very high categories. With very high classification results for all indicators processes, it was necessary to maintain Mitsubishi industrial class in DU/DI with some indicators such as practicum/service/production scheduling indicators, training, learning services, DU/DI assessment, list of values, and graduation procedures. In line with Divayana et al. (2017), the highest effectivity on process components was 88.9% used the Quipper School platform. The most suitable platform to support blended learning implementation in SMK while in Bali was the Edmodo Platform.

The results of this study were in line with Sholikhah & Soenarto's (2013) research. The results showed the socialization process, selection, debriefing, program implementation process, monitoring, and reporting processes included in the "effective" category with an achievement percentage of 74.52%. The results of this study were not the same as the results of the DU/DI evaluation process by Salman (2016), who found learning methods of the trainers were in the medium category. Darma's research (2019) showed that teaching programs implementation in the PNB Mechanical Engineering Department based on the linkage of CIPP components was declared quite effective. The biggest obstacle was the process and product variable related to non-academic evaluation and learning achievement.

CONCLUSION

Based on the result and discussion in the Evaluation Process of Industrial Class in Light Automotive Engineering, the conclusion can be elaborated as follows. The evaluation of the process of Mitsubishi Industrial Class for students with indicators of practicum/service/production scheduling, student participation, and overall student activity achieved 2.89 of average score or declared sufficient classification and quite effective. To advance it some improvements were necessary. The evaluation process of the Mitsubishi Industrial Class for teachers with indicators of practicum/service/production, scheduling, lesson planning, learning services, teacher assessment, list of grades, and graduation procedures got 3.7 of average score or stated as a high classification and very effective. However, it was necessary to maintain the Mitsubishi Industrial Class for the teacher. The evaluation process of Mitsubishi Industrial Class for DU/DI with indicators of practicum/service/scheduling production, training assessment, learning services, DU/DI assessment, list of grades, and graduation procedures obtained 4.4 of average score or declared as very high classification and very effective. Furthermore, it was necessary to maintain Mitsubishi Industrial Class on DU/DI.

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