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The Evaluation of Teaching Factory in SMK Negeri 2 Adiwerna Using CIPPO Model

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Abstract

Teaching factory implementation is expected to be link and match between school and industrial world to produce competent graduates who can meet the demand of industry. In its implementation, teaching factory requires teachers to understand its concepts, technicality, and implementation. Evaluation is necessary to be conducted to obtain an overview of the success and benefits of teaching factory. However, recent evaluations have only focused on the aspects of results and constraints, yet the whole evaluation is the one that is significant to carry out. Therefore, this research attempted to evaluate teaching factory using CIPPO (Context, Input, Process, Product, Outcome) model. It analyzed the implementation of Teaching Factory in Adiwerna 2 Public Vocational High School or SMK Negeri 2 Adiwerna, the success and benefit levels of teaching factory viewed from the aspects of context, input, process, product, and outcome in SMK Negeri 2 Adiwerna, and factors constraining the implementation of it. To do so, the researchers employed quantitative method through questionnaire, interview, and documentation as the data collection instruments. For the analysis, the research used percentage description system. The data analyzed were collected from research subjects including the principal, vice principal in in charge of facilities and infrastructure, vice principal in charge of curriculum, the head of Computer and Network Engineering (CNE), Internship Group, Special Job Market (SJM), teachers, and students in grade XI who studied productive subject of CNE and business / industrial world. The results showed that: (1) overall, the implementation of teaching factory in SMK Negeri 2 Adiwerna run fairly well. (2) the context aspect gained the mean percentage of 64% in the fairly good category, the input aspect gained the mean percentage of 71% in the fairly good category, the process aspect gained the mean percentage of 74% in the fairly good category, the product aspect gained the mean percentage of graduates was 62% in the fairly good category, the outcome aspect gained the mean percentage of 84% in the good category. All those aspects obtained the mean percentage of 71% in the fairly good category. (3) there found several factors constraining teaching factory implementation and things to improve in the aspects of context and input. The context aspect lacked of cooperation with business / industrial world in the procurement of facilities and training with the mean percentage of 40% in poor category so that the subjects taught were less synchronized with the real situation in business/ industrial world. Meanwhile, the product aspect or the graduates who were absorbed into business/ industrial world were less optimal that based on the tracing data, the graduates of CNE in 2019 who were absorbed into business/ industrial world was 40% in the poor category. This calculation was even less optimal since there left 31 students of 94 with the percentage of 32.98% who have not yet given report so that it contributed to significant calculation results.

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INTRODUCTION

Vocational High School (VHS) or SMK as vocational secondary education is a subsystem of National Education system which holds a strategic role in the realization of nationally skilled workers. As a worker producer, SMK must be able to develop school cultures that can foster educational standard by designing industrial world-based school curriculum oriented towards the development of vocational secondary education system.

The development in the world of work must surely be followed by educational institutions to prepare competent workers such as by SMK. This institution should develop the system based on market driven approach. Market driven approach enables the match between learning process in school and reality in the world of work or business. In this way, there will be corresponding competency mastery of SMK graduates and workforce needs.

Skilled Human Resources (HR) procurement is prepared by the government by issuing policies to improve the standard of vocational education for SMK. The current SMK development orientation ranges from local labor market to ASEAN labor market as an effort to prepare for ASEAN economic community (AEC), entrepreneurship characters. In line with this, the implementation of teaching factory in SMK is a manifestation of Indonesia Directorate of SMK Development to strengthen the synergy between SMK and industry. This Teaching Factory is expected to the executor of learning that can change students' attitudes and characters so that industrial sector will not get any difficulties in recruiting workers. Most of industries only want to recruit workers based on what they desire without making them as an investment. Therefore, Teaching Factory implementation can be link and match between school and industrial world.

Teaching Factory (TEFA) is a product-based learning (can be service or product) through the synergy of school and industry to produce competent graduates based on the industrial needs. According to Kuswantoro (2014:22) Teaching Factory is a real-conditioned learning concepts which facilitate competency gap between knowledge given by school and industrial needs. Meanwhile, D.A.F., Marji M., & Tuwoso, T. (2018) in their study state that Teaching Factory is a production-based learning that brings industrial atmosphere into the learning. By doing so, students are expected to be ready to work and have entrepreneurial spirit so that the unemployed graduates of SMK can be alleviated. Hadlock, Wells, Hall, Clifford, Winowich, and Burns (2008: 14) state that Teaching Factory goal is to emphasize that teaching students should be more than what is in the book. Here, students not only practice soft skill in learning, learn to work in groups, sharpen interpersonal communication, but also obtain real experiences and practice work to enter the world of work later.

Teaching Factory is a development of production unit, namely the application of partner industry system to the production unit available in SMK. Production unit is a development done for school business sector to earn more income for the maintenance of facilities and HR improvement, and equip students with real life work experience. This unit is legally regulated by Government Regulation No. 29 of 1990 article 29 paragraph 2, namely "To prepare vocational high school students to become workers, vocational high schools can establish production units that operate professionally."

Teaching factory aims to improve the quality of learning outcomes more than just providing competency (competency-based training) to be a learning process that prepares abilities to produce goods / service. It can also be defined as the combination of competency-based learning and production-based learning which means that the provision of skills is designed and carried out based on the actual work procedures and standards to meet products in accordance with market/ consumers' demand. The product can be goods or service.

Successful Teaching Factory implementation depends on the application of good process based on business/ industrial world standards. Then, there is a need for effective and efficient learning to minimize gaps between school and business/ industrial world. To determine the achievement of Teaching Factory implementation, regular monitoring and evaluation should be made. Meanwhile, in this research, the Teaching Factory implementation was evaluated using CIPPO model.

Initially, CIPP model was developed by Sutfflebeam (1967). It is an abbreviation of the initial letter of four words, namely Context Evaluation, Input Evaluation, Process Evaluation, and Product Evaluation. This model sees an implementation as a system. As a result, when an evaluator has decided to use this model, he inevitably should analyze an implementation using its components. Later on, this model was added with one O component as Outcome and becomes CIPPO. When CIPP stops its evaluation in Output (product), CIPPO reaches up to product implementation.

CIPPO model is expected to give a detailed and comprehensive description of successful implementation of Teaching Factory. It is in line with Amata Jaedun (2010:10) who mentions to evaluate an implementation, another evaluation should be made on the effect or outcome (O) other than the components of context (C), input (I), process (P) and product (P) that is how graduates manage to survive in society or workplace. In details, the components CIPPO evaluate cover

context component, namely an evaluation given to needs and implementation objectives whether Teaching Factory has been implemented well to solve any constraints, input component realized in the evaluation of supporting resources on the implementation of Teaching Factory, process component which covers an evaluation on the process of implementation activities and whether the activities have been done based on the guidelines, product component that includes an evaluation on the results of Teaching Factory implementation whether the results meet the expectation or not, and outcome component which evaluates the benefits of the implementation for students and graduates.

The success of Teaching Factory implementation in a school is determined from the high score of achievement obtained by all implementation aspects. The aspects, as mentioned earlier consist of context, input, process, product and outcome. Further, context aspect covers objectives of areas of expertise, industrial relations and teaching guidelines, input aspect includes human resources, learning environments and infrastructure, process aspect includes preparation of lesson plan and jobsheets, student's participation in learning process and teacher's performance, product aspect covers learning outcomes and graduates, and outcome aspect includes the progress of graduates in the business world and the industrial world.

According to the aforementioned explanation, the researchers were eager to investigate "The Evaluation of Teaching Factory Using CIPPO Model in SMK Negeri 2 Adiwerna" with hope to enlighten and provide solutions to produce competent graduates based on industrial needs.

Of the above focus, the objectives of this research were (1) to analyze the implementation of Teaching Factory in SMK Negeri 2 Adiwerna, (2) to analyze the success and benefit levels of Teaching Factory based on the aspects of context, input, process, product, and outcome in SMK Negeri 2 Adiwerna, (3) to analyze factors constraining the implementation of Teaching Factory in SMK Negeri 2 Adiwerna.

METHOD

Method

This research is a type of evaluation research focused on the implementation of Teaching Factory using CIPPO model (Context, Input, Process, Product, Outcome) in SMK Negeri 5 Adiwerna, Tegal Regency. It used an evaluation design and procedures to systematically approach, collect, and analyze the implementation of Teaching Factory to determine criteria as a benchmark of success. Meanwhile, quantitative approach was the method of this research.

Regarding research subject, this research involved a school and companies as data sources. For the respondents, the researchers included the principal, vice principal in charge of curriculum, vice principal in charge of facilities and infrastructure, the head of CNE, internship group, SJM. Productive teachers as many as 10 people, 36 students of CNE 1in grade XI, 36 students of CNE 2 in grade XI, 36 students of CNE 3 in grade XI, and 10 companies as business/ industrial world respondents.

To collect the data, this research used interview, documentation, and questionnaire.

1.1 Interview technique

Interview is conducted by asking some structured questions that can be developed by an interviewer in its implementation. The interview in this research was done to obtain the condition of teachers, facilities and infrastructure data as well as constraints faced by the school in Teaching Factory implementation

1.2 Documentation technique

Documentation technique is utilized to collect documents data related to this research, including the data of students and teachers, syllabus, lesson plan, Jobsheet prepared by the teachers, and learning achievement by students and alumni who have worked in business/ industrial world.

1.3 Questionnaire technique

In the current research, this technique was employed to collect the data of industrial cooperation, teacher readiness, teacher opinion, students' participation, and the assessment of in business/ industrial world.

Research Instrument

Student and teacher's questionnaires were tested in terms of its validity and reliability.

2.1 Validity

Validity is evidence and theoretical support for the interpretation of test scores according to the intended use of the test. Thus, validity is the most basic foundation in developing and evaluating a test (Mardapi, 2008: 16). In other words, validity is a measure that shows the level of validity an instrument.

To check the instrument validity, this research made use of content validity whose logical meaning means reason or makes sense and is rational. Instruments are said to have internal or rational validation if the criteria in the instrument rationally (theoretically) reflect what is being measured.

Content validity in this research was tested by the procedures of compiling questionnaire based on the designed table of specification from in-depth theoretical studies. After that, the questionnaire draft was consulted with advisers or experts (expert

judgement. Once the approval was obtained, the research was started. Through these processes, all instrument items have covered the whole variable contents to measure.

The reliability of the questionnaire instrument used in this research was judged by calculating scores and analyzing answers from the instrument validation sheet in form of check list.

The complete assessment given by the experts on the reliability of the questionnaire is presented in table 1.

Tabel 1. The experts' judgement on the instrument reliability

Component	Total Score	Percentage (%)	Criteria
Context	7	87.5%	Very good
Input	6	75%	Good
Process	8	100%	Very good
Product	6	75%	Good
Outcome	8	100%	Very good
Total Score	35	350%	-
Mean	8.75	87.5%	Very Valid

By referring to the above data on expert judgement, the mean score of context, input, process, product, and outcome components was 8.75 with the percentage of 87.5%, meaning that all components met the category of very valid and reliable to use with some revision notes from the experts to improve the instrument.

Each instrument item was validated through item analysis by correlating the score of each item with the total score of all items. Here, the researchers used product moment correlation developed by Pearson using the following formula.

$$r_{xy} = \frac{N\sum XY - (\sum x)(\sum Y)}{\sqrt{N\sum x^2 - (\sum x)^2\, N\sum Y^2 - (\sum Y)^2}}$$

Information:

r_{xy} = correlation coefficient
X = item score
Y = total score
N = total respondents
$\sum X^2$ = Total X value quadrant
$\sum Y^2$ = Total Y value quadrant

The validity was measured by correlating the score in each factor with the total score using product moment correlation. Its results were compared to the significant level of 5% in r table. Once the results were obtained, the instrument validity can be decided. If the correlation coefficient is higher than the value of r table, the factor becomes valid, and vice versa.

The results of the data validity test of the questionnaire instrument tested on students and teachers are as follows.

a) Student's questionnaire

After the results of the questionnaire validity test tested on students, the researchers got the value of r count ≥ r table (0.195) meaning that the instrument was declared valid.

b) Teacher's questionnaire

Similar to student's questionnaire, the results of the validity test of the questionnaire instrument tested on the teacher had the value of r count ≥ r table (0.632) so that it was declared valid.

2.2 Reliability

Reliability is the extent to which the results of a measurement can be trusted. It works when an instrument achieves relatively the same results in measuring the same group (Syaifudin Azwar, 2002: 3). Reliability refers to an understanding that an instrument can be trusted enough to be used as a data collection tool because the instrument is good. A test is said to have a high level of reliability if the test can provide consistent results if it is repeatedly done. In this research, the instrument tested for reliability was developed by the researchers. Those were the instrument to measure the components of the context, input, process, product and outcome. Alpha coefficient formula determined the reliability of is because the score on the instrument items was stratified, namely between 1 to 5. Hence, Alpha Cronbach formula was used to calculate the reliability test (Arikunto Suharsimi, 2010: 164). The Cronbach Alpha formula in question is as follows.

$$\boldsymbol{r_{11}} = \left[\frac{k}{k-1}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right]$$

r_{11} = instrument reliability
k = right answer from total subjects
$\sum \sigma_b^2$ = total items
σ_t^2 = standard deviation of the test

The results of student and teacher's questionnaire reliability test are elaborated in the following descriptions.

a) Student's questionnaire

Student's questionnaire reliability test obtained the value of Cronbach's alpha of 0.899. This value was then compared to the r table by N=108, while its result was compared by the researchers with the significance value 5% of r table and resulted 0.195. Since the Cronbach's alpha value was greater than 0.195 (r table), it could be assumed that the questionnaire was reliable to use as a data collection instrument in this research.

b) Teacher's questionnaire

Teacher's questionnaire reliability test gained the value of Cronbach's alpha of 0.950. After that this value was compared to the r table by N=10, while its result was compared to the significance value 5% of r table and resulted 0.632. By having the

Cronbach's alpha value greater than 0.195 (r table), namely 0.950>0.632 it could be assumed that the questionnaire was reliable to use as a data collection instrument

With regard of the above explanation, the instruments used to collect the data were declared reliable due to its results that was valid and reliable in validity and reliability tests.

Data Analysis

The data analysis technique employed in this research was percentage descriptive analysis technique. The percentage descriptive formula (quantitative) is as follows.

$$DP = \frac{n}{N} \times 100\%$$

DP = Percentage Description

n = score obtained

N = ideal score

Percentage description analysis was applied by the researchers to analyze the data of this study. The percentage of each indicator was interpreted in form of sentence, while the categorization of the level in percentage form is presented as follows.

Table 2. The classifications of level category in form of percentages (Supranto, 2007)

NO	Interval	Information
1	76% - 100%	Good
2	51% - 75%	Fairly good
3	26% - 50%	Fairly good
4	1% - 25%	Poor

Table 2 presents the functions and categorization of level based on interval to decide the extent to which the level of success and achievement was achieved in each indicator of instrument.

RESULT AND DISCUSSION

The Analysis of Teaching Factory Implementation in SMK Negeri 2 Adiwerna

The data analysis and findings of teaching factory implementation can be seen from each aspect, namely.

First, the context aspect which refers to expertise, industrial relations, and teaching guidance showed fairly good results. It meant that the implementation of teaching factory has been appropriate although there were some points that must be improved to run well and be in accordance with the objectives. For instance, the non-linear of graduates' competences with business/ industrial world because there were many things to synchronize such as unmatched subjects with business/ industrial world, the lack of cooperation with business/ industrial world in providing facilities and trainings so the subjects taught were not thoroughly suitable with the actual situation of business/ industrial world, and the selection of business/ industrial world partners should be in line with the competences taught in school.

Second, the input aspect which covers human resources, learning environment, and infrastructures revealed fairly good results. In other words, the implementation of teaching factory has been in line. However, there were still some parts that should be improved such as formal education background that has not been compatible and made the teaching and learning process became less optimal, the lack of skill and expertise from teachers in the implementation of industrial practices which caused the need of training improvement as the support, the need of good communication between teachers in conducting Teacher Factory implementation to reduce miscommunication, the infrastructures should be adjusted with business/ industrial world standards as well as industrial actual situation and provide reserves when something is damaged, the practical tools used were not in accordance with business/ industrial world standards so that equipment synchronization must be done, and the equipment use and maintenance were also not in accordance with business/ industrial world standards so business/ industrial world should organize trainings to support the industrial practice.

Third, the process aspect which comprised lesson plan (RPP) and jobsheet preparation, students' participation during learning process, and teachers' performance conveyed fairly good result. Similar to other aspects, the process aspect also had some issues to improve, including students' difficulties in comprehending jobsheet, so it is necessary to create adequate prototypes of it, students motivation should be improve in case some students were lack of motivation in joining the learning activities, it is necessary to coordinate the students to create comfortable and good class condition since there were still some students who came in and out during the learning process, the lack of reflection in learning caused students boredom and inconvenience, and enrichment is also necessary to discuss material which students have not understood.

Fourth, the product aspect which included the learning outcomes and graduate also showed fairly good results. To make the teaching factory run better, some matters still needed to be improved, including SMK graduates who were absorbed into DU/ DI were not maximal based on the tracing data of CNE graduates in 2019. The total graduates of SMK Negeri 2 Adiwerna in business/ industrial world was 40% in poor category. Under this circumstance, the implementation of teaching

factory tremendously affected to graduates acceptance in business/ industrial world. It was proved by the data of average and percentage result graduates which was in poor category. However, the calculation data have not been optimal since there were 31 students (32.98) have not reported their progress. It then significantly affected the calculation result.

Fifth, the outcome aspect which included graduates' contribution in business and industry showed good results. It helped teaching factory ran well. Based on the assessment data result of graduates' contribution from ten companies in business/ industrial world in 2019, the total mean of technical aspect was 84 or in the good category, while the total mean of knowledge aspect was 84 or belonged to good category. In addition, the recapitulation data of this aspect proved that the implementation of Teaching Factory was affected the work linearity in business/ industrial world.

The Analysis of success and benefits levels of Teaching Factory implementation viewed from context, input, process, product, and outcome aspects in SMK Negeri 2 Adiwerna

Based on the data analysis results of success level and benefits of teaching factory implementation viewed from 5 aspects, namely context, input, process, product, and outcome aspects, the assessment results are obtained as follows.

2.1 The results of context aspect assessment analysis

The implementation of context aspect including expertise, industrial relation, and teaching guidance conveyed the result as seen the following table.

Table 3. The analysis results of context aspect assessment

Evaluation Aspect	Technical Variable	Indicator	Percentage Indicator (%)	Percentage Mean (%)	Information
Context	Expertise	Enhancing graduates' competency	72	63	Fairly Good
		Adjusting graduates' competences with business/ industrial world	55		
	Industrial relation	Appropriate business/ industrial world profile in learning	63	52	Fairly Good
		Cooperation with business/ industrial world in training activities	53		
		Cooperation with business/ industrial world in providing facilities	40		
		Developing partnership with business/ industrial world in teaching factory implementation	53		
	Teaching guidance	Availability of Syllabus	80	76	Good
		Suitability of syllabus	72		
Mean of context aspect			61	64	Fairly Good

Based on table 3, the total mean of technical variable of expertise was 63% with fairly good category, industrial relation was 52% with fairly good category, and teaching guidance was 76% with good category. Therefore, the total mean of context aspect was 64% with fairly good category.

Above all, the data analysis showed that the implementation of teaching factory was appropriate due to the total average of variables was in fairly good category.

2.2 The results of input aspect assessment analysis

Input aspect implementation covered human resources, learning environment, and infrastructures. The analysis results are presented on the following table.

Table 4. The analysis results of input aspect assessment

Evaluation Aspect	Technical Variable	Indicator	Percentage Indicator (%)	Percentage Mean (%)	Information
Input	Human Resources	Linear Formal Educational background	69	70	Fairly Good
		Linear non-formal educational background	57		
		The ability to manage learning based on teaching factory's principles	66		
		Good personal competence	75		
		Good social competence	77		
		Professional, deeply master the learning material both theoretically and practically	77		
	Learning environment	Physical environment	80	71	Fairly Good
		Relation between teachers and students	80		
		Relation among teachers	52		
	Facilities and Infrastructure	Facilities and infrastructure as appropriate as DU/ DI standard	68	73	Fairly Good
		Total adequate facilities and infrastructure	84		
		The completeness of school facilities and infrastructure either in class or workshop	78		
		Adjustment of practical tools used	67		
		the appropriate use and maintenance as business/ industrial world procedure	67		
Mean of input aspect			71	71	Fairly Good

Table 4 presents the research data on the implementation of Teaching Factory viewed from the aspect of input. In this aspect, all technical variables were in the fairly good category, such as human resources obtained 70% in the fairly good category, learning environment obtained the mean of 71% in the fairly good category, and facilities and infrastructure obtained 73% in the fairly good category. Meanwhile, the mean of all scores of input aspect was 71% in the fairly good category. This data recapitulation approved that the implementation of Teaching Factory has been appropriate evidence by the overall score mean in the fairly good category.

2.3 The results of process aspect assessment analysis

After the data collection, the implementation of input aspect, including lesson plan and jobsheet, students' participation in learning process and teacher's performance are presented in the following table 5.

Table 5. The analysis results of process aspect assessment

Evaluation Aspect	Technical Variable	Indicator	Percentage Indicator (%)	Percentage Mean (%)	Information
Process	Learning Material Preparation	Lesson plan preparation	77	76	Good
		Jobsheet preparation	66		
		Textbook reference/ lesson plan supporting documents	70		
		Lesson plan components	80		
		Schedule	88		
	Students' participation in learning process	Motivation	68	70	Fairly Good
		Concentration	72		
	Teacher's Performance	Learning hour management	88	76	Good
		Student's attendance in Teaching Factory learning	79		
		Classroom atmosphere Setting	58		
		Learning management	67		
		Problem solving	81		
		Learning media usage	71		
		Questioning skills	78		
		Answering skills	90		
		Reflection	65		
		Test	77		
		Student's portfolio	86		
		Assessment	86		
		Enrichment	68		
Mean of process aspect			76	74	Fairly Good

Table 5 contains the research data on the implementation of Teaching Factory based on Process aspect. It resulted that the technical variables of learning material preparation gained the mean of 76% in the good category, student's participation in learning process gained the mean of 70% in the fairly good category, teacher's performance gained the mean of 76% in the good category, and the overall mean of 74% in the fairly goof category.

The above recapitulation indicated that Teaching Factory implementation has run smoothly in accordance with the overall mean categorized in the fairly good category.

2.4 The results of product aspect assessment analysis

The implementation of product aspect covering learning outcomes and graduates obtained the following results

Table 6. The analysis results of product aspect assessment

Evaluation Aspect	Technical Variable	Indicator	Percentage Indicator (%)	Percentage Mean (%)	Information
Product	Learning outcomes	Attitude assessment	85	83	Good
		Knowledge assessment	82		
		Skill assessment	82		
	Graduate	SMK graduates who were absorbed into business/ industrial world	40	40	Poor
Mean of product aspect			72	62	Fairly good

The implementation of Teaching Factory seen from the product aspect achieved various results by the technical variables. In terms of learning outcomes, the mean was 83% in the good category and in terms of graduate, the mean was 40% in the poor category, and the overall mean of these variable was 62% in the fairly good category. These data meant that the Teaching Factory implementation needed to improve its graduate variable. However, the overall implementation in its aspect was still fairly good evidence by the overall mean of variables.

2.5 The results of outcome aspect assessment analysis

The implementation of the Outcome aspect, namely the progress of graduate in the business and the industrial world can be seen as follow.

Table 7. The analysis results of outcome aspect assessment

Evaluation Aspect	Technical Variable	Indicator	Percentage Indicator (%)	Percentage Mean (%)	Information
Outcome	Graduate progress in the business and industrial world	Graduate performance assessment in the business and industrial worl	84	84	Good
Mean of outcome aspect			84	84	Good

According to the implementation of Teaching Factory seen from the aspect of outcome in table 7, the technical variable of graduate progress in the business and industrial world achieved the mean of 84% in the good category. It confirmed that the implementation of Teaching Factory has been proper.

2.6 The data analysis recapitulation of Teaching Factory implementation using CIPPO model

Once all analysis results of the data have been obtained, the researchers compiled the implementation of Teaching Factory using CIPPO in SMK Negeri 2 Adiwerna in the following recapitulation.

Table 8. The Recapitulation of data analysis results In association

No	Evaluation Aspect	Percentage (%)	Information
1	Context	64	Fairly Good
2	Input	71	Fairly Good
3	Process	74	Fairly Good
4	Product	62	Fairly Good
5	Outcome	84	Fairly Good
Mean		71	Fairly Good

with table 8, the context aspect gained the mean of 64% in the fairly good category, the input aspect gained the mean of 71% in the good category, the process aspect gained the mean of 74% in the good category, the product aspect gained the mean of 62% in the fairly good category, and the outcome aspect gained the mean of 84% in the good category. This recapitulation showed that the implementation lacked of some aspects so that it was not perfect. However, the overall results covered good implementation indicated by the mean score that was in the fairly good category.

The Analysis of factors constraining the implementation of the Teaching Factory

After obtaining information from the data analysis and findings of the aspects of context, input, process, product, and outcome, the researchers compiled factors constraining the implementation of Teaching Factory implementation of each variable.

3.1 Factors constraining the Teaching Factory in the context aspect

Constraints found in the context aspect were such as the non-linear graduate competence to the business/ industrial world due to unsynchronized matters, for example subjects matched with business/ industrial world needs, lack of cooperation with business/ industrial world needs in the procurement of facilities and trainings so that the subjects taught were not fully synchronized with the real condition in business/ industrial world, and the unmatched business/ industrial world partners with the competence taught in school.

3.2 Factors constraining the Teaching Factory in the input aspect

Some constraints in the input aspect were the non-linear educational background of teachers, lack of abilities and skills owned by the teachers in teaching industrial practice so that it is better for the school to provide trainings to improve the teachers' skills in teaching practice subjects based on industry standards, lack of good communication among

teachers in implementing Teaching Factory to reduce miscommunication, facilities and infrastructure that have not yet been adjusted to business/ industrial world standards and the backup to assist any broking equipment, the non-linear practice equipment with the standards of business/ industrial world so that the school is encouraged to adjust to those in the industry, the use and maintenance of tools were still not in accordance with business/ industrial world, so it is necessary to give trainings from business/ industrial world to support practical skills according to the industry.

3.3 Factors constraining the Teaching Factory in the process aspect

Based on the data analysis, some constraints in the process aspect were found. Those were the difficulties faced by the students in reading and understanding jobsheet, so another prototype in line with jobsheet should be prepared, students' low motivation proved by some students who were reluctant to join the learning process, lack of coordination in the learning process since it was found some students came in and came out of the classroom during the practical learning, lack of reflection in teaching and learning process indicated by students' passive participation, unavailability of enrichment to discuss materials students have not yet understood.

3.4 Factors constraining the Teaching Factory in the product aspect

In product aspect, it was known that the constraints took place on the SMK graduates who were not absorbed into business/ industrial world optimally according to the tracing data of CNE graduates in 2019. It was found that those who were absorbed was only 40% in the poor category. Even, these data were not optimal due to the absence of 3i students with the percentage of 32.98% who have not yet reported themselves. Hence, this truly has significant contribution to this aspect.

3.5 Factors constraining the Teaching Factory in the outcome aspect

This aspect got no constraint since the progress of graduates in the business/ industrial world was categorized into good. It meant that the Teaching Factory has been implemented well.

CONCLUSION

Based on the findings and discussion about the evaluation of Teaching Factory implementation using CIPPO model in SMK Negeri 2 Adiwerna, some conclusions were drawn.

First, the analysis results of the implementation of Teaching Factory in SMK Negeri 2 Adiwerna imply that the context aspect is categorized as fairly good, the input aspect is categorized as fairly good, the product aspect is categorized as fairly good, and the outcome aspect is categorized as good. Therefore, the whole implementation of Teaching Factory has run well. Second, the analysis of the success and benefits of the Teaching Factory implementation concludes that the context aspect belongs to the fairly good category with the mean percentage of 64%, the input aspect belongs to the fairly good category with the mean percentage of 71%, the process aspect belongs to the fairly good category with the mean percentage of 74%, the product aspect is in the fairly good category with the mean percentage of 62%, and the outcome aspect is in the good category with the mean percentage of 84%. The total mean of those aspects also belongs to the fairly good category with the percentage of 71%. Third, factors constraining the implementation of Teaching Factory and things to improve lie in the aspects of context and product. In the context aspect, the things to improve are in the cooperation with business/ industrial world in the procurement of facilities and trainings amounted to 40 % in the poor category. This percentage proves that the subjects taught to the students are not all synchronized with the real condition in business/ industrial world. In addition to this, the constraints in the product aspect focus on the SMK graduates who are not optimally absorbed into business/ industrial world. It was proved by the tracing data of the CNE graduates in 2019 that there was only 40% of the graduates who have worked in business/ industrial world. This fact makes the product aspect belongs to poor category. Even more, there are 31 of 94 students or 32.98% who have not reported themselves so that it significantly affects to the calculation results.

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