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## A NEEDS ANALYSIS OF CIPPO EVALUATION MODEL COMPONENTS AS A QUALITY ESCALATION OF COOPERATION PROGRAM WITH INDUSTRIES: VOCATIONAL SCHOOL PERCEPTIONS IN WEST JAVA, INDONESIA

上下文、輸入、過程、產品、輸出評估模型組件的需求分析作為與行業合作計劃的質量升級：印度尼西亞西爪哇職業學校的看法

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### Abstract

Industry-vocational school cooperation facilitates school-to-work transitions, addresses the skills shortages of prospective employees, provides opportunities for students to experience various careers, and increases learning effectiveness. The Indonesian government launched the Link & Match program that connects vocational schools with industry in a collaborative framework, including curriculum alignment, fruitful teacher training, vocational student work practices, provision of workplace trainers, and strengthening of teaching factories. The CIPPO evaluation model (context, input, process, product, output) is needed to improve the quality of the collaboration results. This study aimed to analyze the components of the optimization needs of the CIPPO evaluation model according to the perspective of vocational high schools. This study used questionnaires and interviews to collect data. In total, 16 vocational schools in West Java, Indonesia, were involved in this study. The study results indicate a need for a CIPPO evaluation model with the context, input, and product aspects. The outcome aspects are necessary for escalating the quality of the cooperation program between the vocational schools and industry from the perspective of vocational schools in West Java. Future research is necessary, referring to the industrial prospect. This research can apply as a reference in developing a link and match program evaluation application that will assist the Directorate General of Vocational Education, Ministry of Education and Culture of the Republic of Indonesia. This research should be a model for institutions

outside Indonesia, such as SEA-TVET, a consortium of technical and vocational education and training (TVET) providers from Southeast Asian (SEA) countries, and universally to strengthen partnerships between TVET institutions and the industrial sector.

**Keywords:** CIPPO Evaluation Model, Link and Match Program, Quality Escalation, Vocational School

**摘要** 產職校合作促進從學校到工作的過渡，解決準員工的技能短缺問題，為學生提供體驗各種職業的機會，並提高學習效率。印度尼西亞政府啟動了鏈接與匹配計劃，在協作框架下將職業學校與行業聯繫起來，包括課程調整、富有成效的教師培訓、職業學生工作實踐、提供工作場所培訓師和加強教學工廠。需要評估模型（上下文、輸入、過程、產品、輸出）來提高協作結果的質量。本研究旨在從職業高中的角度分析評價模型優化需求的構成要素。本研究採用問卷調查和訪談的方式收集數據。總共有 16 所位於印度尼西亞西爪哇的職業學校參與了這項研究。研究結果表明需要一個包含上下文、輸入和產品方面的上下文、輸入、過程、產品、輸出評估模型。從西爪哇職業學校的角度來看，成果方面對於提升職業學校與行業之間合作計劃的質量是必要的。未來的研究是必要的，參考工業前景。這項研究可以作為參考，用於開發鏈接和匹配程序評估應用程序，以協助印度尼西亞共和國教育和文化部職業教育總局。這項研究應該成為印度尼西亞以外機構的典範，例如，一個來自東南亞國家的技術和職業教育與培訓提供者聯盟，並普遍加強技術和職業教育與培訓機構與工業部門之間的伙伴關係。

**关键词:** 国际知识产权保护组织评估模型、链接和匹配程序、质量升级、职业学校

## I. INTRODUCTION

Vocational education is one of the important sectors in Indonesia's national education system, which is designed to produce human resources who are ready to work to increase productivity and the national economy [1], [2]. The Indonesian vocational education system [3], as regulated in Law no. 20 of 2003, consists of (1) vocational education, and (2) a vocational training system [4], [5]. Indonesia organizes high-level vocational education called Vocational High Schools or SMKs, while Technical Colleges, Polytechnics, Institutes, and Universities are under the supervision of the Council for Higher Education (called DIKTI), which is under the coordination of the Ministry of Education and Culture organize higher-level vocational education [6]. The National Education Standards Agency (BSNP) is an external institution whose function is to monitor and evaluate educational institutions in Indonesia. While BAN PT functions to conduct accreditation in controlling the quality of education. In the industrial era 4.0, to ensure the quality of vocational education, the role of the TVET institution as a provider of competent labor is urgently needed.

Generally, the current condition of vocational education in Indonesia is quite good, although there are still many problems that must be

resolved [7]. One of the main problems is the involvement of the world of work and industry in vocational education to increase link and match both in terms of quantity (how many graduates the world of work needs), quality [7] (what competencies and abilities the world of work needs), job, location (where vocational schools should be offered and what types), and time (when the world of work needs graduates) [7]. Currently, vocational education in Indonesia seems to have received less support from the business world and industry [1], [7], and [8].

Additionally, still many reports mention the number of educated unemployed [9], [10] or the lack of relevance of the competence of vocational education graduates to the needs of the industrial world in Indonesia [1]. A gap exists between the education system and the labor market and industry in Indonesia [1]. Graduates produced by educational institutions do not match the needs of the industry. Therefore, vocational education in Indonesia has not met expectations, so structural and systematic [11] improvements are still needed to overcome these problems.

Link and match between vocational education institutions and industry is very necessary as an effort that can be done to prevent mismatches between the supply provided by educational institutions and the demand needed by the industrial world [12]. This synergy is needed so

that the skilled human resources created will be able to obtain jobs that are in accordance with their competencies. Vocational education institutions must have good and deep relationships with related industries to optimize learning in preparing graduates effectively and efficiently [1].

Link and match is a policy of the Indonesian Ministry of Education and Culture that has existed and was developed to increase the relevance of vocational high school (SMK) [8], [13] to the needs of the world of work, business, and industry. This policy is divided into two objectives, namely, at the high school level and at the university level [14], [15]. Especially at the secondary school level, the government's program target is to change the proportion of high school students with SMK from 70:30 to 40:60. Meanwhile, at the university level, it is hoped that the role of industry will create special training and even collaborate to establish institutions according to the type of industry being developed [16]. The link and match policy are expected to reduce the unemployment rate of college and vocational high school graduates.

Vocational High School (SMK) [17] is a secondary vocational education institution in Indonesia that prepares skilled workers ready to work where their presence still needs to be improved [18]. A gap exists between the skills possessed by SMK graduates and the skills needed in the world of work so that not all graduates can meet the demands of work in accordance with their specialization. Additionally, vocational students do not yet fully have job readiness, thus contributing to the increasing number of unemployed [12], [19]. A strategy of the Indonesian government in revitalizing vocational schools is to issue a link and match policy between vocational schools and the industrial world [20]. The purpose of implementing the link and match is to bring the supply and demand of quality human resources closer, where the world of education plays a role as a provider of HR to the world of work, business, and the community in need [21], [22].

A policy issued by the government regarding the link and match of SMK with industry is the Regulation of the Minister of Industry of the Republic of Indonesia Number 3/M-IND/PER/1/2017 concerning the fostering and development of competency-based vocational high schools that link and match with industry. With this policy, it is hoped that there will be synergy between the government, industry, and schools [11] to prepare vocational school graduates who are ready to work, namely, human

resources who can think critically, creatively, and innovatively according to the needs of the community and the job market. The latest effort made to realize the link and match is through the SMK center of excellence program in 2020 [1], [23].

Recently, the Indonesian Ministry of Education and Culture has integrated vocational education and the world of work through the concept of link and match 8+i (2021), which does not only focus on the ceremonial signing of the MOU but focuses on the concrete implementation of link and match collaboration with the world of work. In detail, the concept of link and match 8+i is: (1) curriculum alignment where the preparation of the curriculum for vocational education institutions is carried out together with the world of work; (2) real project-based learning from industry or from the world of work (Project Based Learning); (3) increasing the number of teachers, practitioners, or experts from industry and the world of work to teach at SMK up to 50 hours per semester per study program or expertise program; (4) internship or work practice in the world of work for at least 1 semester for each student; (5) SMK graduates and teachers must have competency certification in accordance with the standards and needs of the world of work; (6) teachers, instructors in vocational education institutions must regularly receive updates and training from the world of work; (7) applied research that supports teaching factories starting from real cases or needs in industry or society, so that research results can be directly distributed to the community as solutions or innovations from vocational education; (8) strong commitment from the business world and the world of work to absorb SMK graduates who have links and matches. Meanwhile, point 'i' is an addition that can be filled with various potential cooperation programs with the world of work, for example, scholarships or official ties, then donations in the form of funding or providing equipment, or other forms of collaboration [24].

To assess the success and achievement of linking and match as a framework for cooperation between vocational education institutions and industries, a comprehensive and sustainable targeted evaluation [25], [26] is needed. This link and match program is a new policy in 2021, and no instruments that support the evaluation of the program. Evaluation is a basic component of education [27]. Evaluation is the best way to assess whether an educational program meets the stated goals [28]. Additionally, program evaluation must also be carried out systematically to see which parts of the program

have strengths or weaknesses.

Evaluation is an activity of gathering information to determine effectiveness and find suitable alternatives in the decision-making process [29]. Additionally, evaluation is also considered to systematically collect information to make judgments or decisions [30]. To evaluate the level of achievement of an educational program, determine the effectiveness of the current program and collect some useful information for future programs, an evaluation [30], [31] of the activity program is feasible. Therefore, the implementation of evaluation must be an integral part of improving the quality of education and must be carried out on an ongoing basis.

Several models exist in the evaluation, one of which is CIPPO. The CIPPO evaluation model is an adaptation of the evaluation concept of the Stufflebeam model [32], input, process, and product (CIPP) [33] and the results of [33]. Thus, the CIPPO model is a modified evaluation model [34] from the CIPP model, which consists of Context, Input, Process and Product. The difference in the CIPPO model is that there are additional stages, namely Outcome. The uniqueness of the CIPP model is that each type of evaluation is linked to a decision-making tool that involves program planning and operation. The CIPPO evaluation model (context, input, process, product, and outcome) is needed to improve the quality of the results of collaboration between vocational education institutions and industry. This study analyzes the components of the need for optimizing the CIPPO evaluation model according to the SMK perspective.

## II. METHOD

This study was conducted between May and August 2022 to analyze the components of the optimization needs of the CIPPO evaluation model according to the perspective of vocational high schools. The quantitative research method was preferred as the research method. This study uses the questionnaire technique as the data collection technique and interview as a complement. The research process was carried out, as shown in Figure 1.

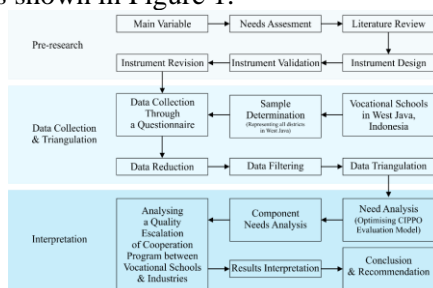


Figure 1. Research process

A total of 16 SMKs in West Java, Indonesia were involved in this research. Research respondents included school principals, deputy principals in charge of curriculum and industrial relations, heads of expertise programs, and teachers in charge of student apprenticeships in industry.

Generally, the questionnaire is divided into two parts: (a) the first part contains a scale related to CIPPO (context, input, process, product and outcome), and (b) the second part is related to the demographic characteristics of the respondents. Each CIPPO component consists of 10 statement items in which respondents must determine their preferences from the Likert scale -type metric expressions (1 = Not Very Necessary ... 5 = Very Necessary). Demographic characteristics include position, institution, last education, and general. All data were analyzed and processed using computer software and using exploratory and descriptive statistics.

Interviews were conducted by proposing reasons for the respondents' preferences for each statement in the CIPPO component. The data analysis phase consists of: (a) data reduction; (b) data presentation, and (c) data processing. The data reduction stage is aimed at sorting out important data focuses according to the theme/pattern of the research objective. Presentation (display data), is done so that the data reduced is well structured and easy to understand.

## III. RESULTS

A total of 16 vocational schools from various cities in West Java, Indonesia were involved in this study. Among the participants, 43.8% were between 24-40 years old and the rest were between 45-54 years old; 68.75% were last educated as a bachelor and the rest were masters; 31.25% of the respondents who participated in the study were teachers-supervisors for industrial internship program students, 31.25% were vice principals in charge of industrial relations, 25% were heads of expertise programs, and the rest were school principals. They come from vocational schools in various areas in West Java, such as the city of Bandung, West Bandung district, Garut, Tasik, Cirebon, Cianjur, Sumedang, Karawang, and Bogor.

There are 5 objectives of the CIPPO evaluation model [32], namely: (1) Context evaluation (formulating program objectives, determining program needs, helping administrators make planning decisions, and serving planning decisions; (2) Input evaluation,

aimed at organizing decisions and determining sources, plans, and alternative strategies in achieving needs according to appropriate procedures; (3) Process evaluation is used to determine the level of effectiveness of the implementation plan and assists in implementing decisions in accordance with the objectives and improvement plans; (4) Product evaluation is used as a service process for recycling decisions and assists decision making after the objectives of the program have been achieved, (5) Outcomes, intended to determine the usefulness of the results of program implementation, and the results are arranged based on the main component model, including:

### A. Context

As shown in Table 1, 64.29% of respondents stated that the Policy Order and the purpose of the cooperation program is very necessary to be evaluated in the vocational education cooperation

program with industry likewise with the suitability of the focus of the collaboration program with the institution's goals, where 57.14% stated that it was very necessary. Meanwhile, needs analysis of discrepancies with circumstances, seems less necessary to be evaluated according to 21.43% of respondents. Through interviews, further reasons are known regarding the respondents' preferences.

*R1:* Cooperation is a form of collaboration that is very much needed in arranging policies so that it is expected to be fulfilled or can fill in the indicators needed in a policy.”

*R9:* So that Inter-agency cooperation has a clear direction regarding the goals to be achieved based on common interests.”

*R1:* It is necessary in every form of cooperation that the program focus is matched with the goals of the institution for effective and efficient results.”

Table 1.  
Respondent's assessment on the context component

Statement	Very unnecessary	Unnecessary	Less necessary	Necessary	Very necessary	SD
Policy Order at campus or business and the industrial world related to cooperation programs	0.00%	0.00%	0.00%	35.71%	64.29%	0.29
The purpose of the cooperation program (at the campus or at business and industrial world)	0.00%	0.00%	0.00%	35.71%	64.29%	0.29
The competency needs of students (for campus) or employees (for business and industrial world) in each cooperation program carried out	0.00%	0.00%	7.14%	42.86%	50.00%	0.24
Community needs for cooperation programs carried out (at campus or at business and industrial world)	0.00%	0.00%	28.57%	35.71%	35.71%	0.18
Target of cooperation program (at campus or at business and industrial world)	0.00%	0.00%	0.00%	50.00%	50.00%	0.27
Responsiveness of cooperation program targets (at campus or at business and industrial world)	0.00%	0.00%	7.14%	42.86%	50.00%	0.24
The suitability of the focus of the collaboration program with the institution's goals (at campus or at business and industrial world)	0.00%	0.00%	7.14%	35.71%	57.14%	0.25
Needs analysis of discrepancies with circumstances (at campus or at business and industrial world)	0.00%	0.00%	21.43%	42.86%	35.71%	0.20
Needs that encourage collaborative programs (at campus or at business and industrial world)	0.00%	0.00%	14.29%	42.86%	42.86%	0.22
Short-term and long-term analysis of the objectives of implementing the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	7.14%	57.14%	35.71%	0.25

### B. Input

As shown in Table 2, 66.67% of respondents stated that the suitability of HR (students or employees). With the program implemented is

very necessary to be evaluated, as well as 61.11% of respondents stated that the availability of facilities and infrastructure is very necessary to be evaluated in the vocational education

cooperation program with industry. Meanwhile, the compatibility of implementing HR competencies (lecturers for campuses, instructors for business and industrial world) with collaboration programs seems less necessary to be evaluated according to 27.78% of respondents. Through interviews, further reasons are known regarding the respondents' preferences.

*R14:* The connection is to support

collaboration and fulfill the possibility of facilities that are not yet owned by Vocational Schools to prepare student competencies.”

*R9:* The appropriate human resources will certainly help the program run effectively. However, what is expected not only in terms of competence, but also in terms of intention, motivation, and intrinsic responsibility to become the main driving force for this HR.”

Table 2.  
Respondent's assessment on the input component

Statement	Very unnecessary	Unnecessary	Less necessary	Necessary	Very necessary	SD
Availability of facilities and infrastructure (at campus or at business and industrial world)	0.00%	0.00%	0.00%	38.89%	61.11%	0.28
The suitability of HR (students or employees) with the program implemented	0.00%	0.00%	0.00%	33.33%	66.67%	0.30
The suitability of HR competency needs (at campus or at business and industrial world)	0.00%	0.00%	11.11%	38.89%	50.00%	0.23
Suitability of student background (for campus or employees (for business and industrial world)	0.00%	0.00%	33.33%	38.89%	27.78%	0.19
Availability of standard operating programs (SOP) at campus or business and industrial world regarding cooperation programs	0.00%	0.00%	0.00%	50.00%	50.00%	0.27
Availability of cooperation program experts (at campus or at business and industrial world)	0.00%	0.00%	16.67%	44.44%	38.89%	0.21
Availability of analysis experts for achieving collaboration goals (at campus or at business and industrial world)	0.00%	0.00%	5.56%	50.00%	44.44%	0.25
Compatibility of implementing HR competencies (lecturers for campuses, instructors for business and industrial world) with collaboration programs	0.00%	0.00%	27.78%	38.89%	33.33%	0.19
Availability of cooperation policy guidelines/documents (at campus or at business and industrial world)	0.00%	0.00%	22.22%	44.44%	33.33%	0.20
The suitability of the standardization of partner focus areas, the number of partner human resources, the availability of partner funding, and the relevance of partners to the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	16.67%	50.00%	33.33%	0.22

### C. Process

As shown in Table 3, 55.56% of respondents stated that the conformity of the plan with the implementation of the cooperation program is very necessary to be evaluated, as well and 50% of respondents stated that the conformity of the implementation of the plan with all components of the cooperation program is necessary to be evaluated in the vocational education cooperation program with industry. Meanwhile, the level of expansion/improvement of cooperation program implementation seems less necessary to be

evaluated according to and 44.44% of respondents. Through interviews, further reasons are known regarding the respondents' preferences.

*R9:* A good plan and appropriate implementation will make it easier to achieve goals and evaluate what is happening in the program.”

*R1:* The suitability of implementation is needed to measure the achievement of program components and the fulfillment of program objectives.”

Table 3.  
Respondents' assessment on process component

Statement	Very unnecessary	Unnecessary	Less necessary	Necessary	Very necessary	SD
The suitability of the implementation of the	0.00%	0.00%	11.11%	44.44%	44.44%	0.23

Statement	Very unnecessary	Unnecessary	Less necessary	Necessary	Very necessary	SD
cooperation program (at campus or at business and industrial world)						
Obstacles in implementing cooperation programs (at campus or at business and industrial world)	0.00%	0.00%	50.00%	27.78%	22.22%	0.21
Conformity of the plan with the implementation of the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	5.56%	38.89%	55.56%	0.26
Readiness of investigative preparation of the collaborative program (at campus or at business and industrial world)	0.00%	0.00%	44.44%	38.89%	16.67%	0.21
Conformity of the implementation of the plan with all components of the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	27.78%	50.00%	22.22%	0.21
Accuracy of the stages of implementing the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	16.67%	66.67%	16.67%	0.27
Level of expansion/improvement of cooperation program implementation (at campus or at business and industrial world)	0.00%	0.00%	44.44%	44.44%	11.11%	0.23
Availability of new / up-to-date things during the collaboration process	0.00%	0.00%	27.78%	55.56%	16.67%	0.23
Achievement of strategies and methods of implementing cooperation programs (at campus or at business and industrial world)	0.00%	0.00%	27.78%	55.56%	16.67%	0.23
The success rate of the process (planning to the end) in the implementation of the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	22.22%	50.00%	27.78%	0.21

#### D. Product

As shown in Table 4, 66.67% of respondents stated that the percentage of skill certification pass rate (student or employee) in a cooperation program is very necessary to be evaluated in the vocational education cooperation program with industry.

Meanwhile, product efficiency because of cooperation programs and the effectiveness of the product resulting from the collaboration program seems less necessary to be evaluated according to

and 33.33% of respondents.

Through interviews, further reasons are known regarding the respondents' preferences.

*R1*: Required as proof of recognition and legality of the program being implemented.”

*R9*: Efficiency of the results of collaboration is needed to assess the efficiency of the resulting product from aspects of cost, policy, usability, etc”

*R11*: Necessary, as material for reflection and follow-up to the cooperation program.”

Table 4.  
Respondents' assessment on product component

Statement	Very Unnecessary	Unnecessary	Less Necessary	Necessary	Very Necessary	SD
Percentage of skill certification pass rate (student or employee) in cooperation program	0.00%	0.00%	11.11%	66.67%	22.22%	0.28
The level of improvement in the competence and skills of students (for campus) or employees (for business and industrial world) in each cooperation program	0.00%	0.00%	11.11%	38.89%	50.00%	0.23
The level of fulfillment of community needs by the results/products of the cooperation program carried out	0.00%	0.00%	22.22%	55.56%	22.22%	0.23
The achievement of the goals of the cooperation program through the products produced (at campus or at business and industrial world)	0.00%	0.00%	11.11%	72.22%	16.67%	0.30
Improved skills and knowledge during the collaborative program (at campus or at	0.00%	0.00%	5.56%	55.56%	38.89%	0.26



Statement	Very Unnecessary	Unnecessary	Less Necessary	Necessary	Very Necessary	SD
business and industrial world)						
Implementation of the final analysis of the actors of the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	33.33%	38.89%	27.78%	0.19
Achievement of satisfaction of implementing cooperation programs (at campus or at business and industrial world)	0.00%	0.00%	22.22%	50.00%	27.78%	0.21
Product efficiency because of cooperation programs (at campus or at business and industrial world)	0.00%	0.00%	33.33%	38.89%	27.78%	0.19
The effectiveness of the product resulting from the collaboration program (at campus or at business and industrial world)	0.00%	0.00%	33.33%	44.44%	22.22%	0.20
Eligibility of products resulting from cooperation programs (at campus or at business and industrial world)	0.00%	0.00%	27.78%	38.89%	33.33%	0.19

### E. Outcome

As shown in Table 5, 61.11% of respondents stated that the level of usefulness of the cooperation program carried out is very necessary to be evaluated in the vocational education cooperation program with industry as well as 50% respondents stated that Improving the ability/skills/innovation of the implementers of the cooperation program, is very necessary. Meanwhile, the level of efficiency of the implementation of the cooperation program carried out seems less necessary to be evaluated

according to 38.89% of respondents. Through interviews, further reasons are known regarding the respondents' preferences.

*R10:* If the program is not useful, then it is useless to do a program. Just a formality and does not provide any benefits.”

*R11:* Program implementers must obtain increased skills to be able to spread these skills to other HR to improve and provide benefits as much as possible and as widely as possible.”

*R12:* Necessary, as a reference for the success of a cooperation program.”

Table 5. Respondents' assessment on outcome component

Statement	Very unnecessary	Unnecessary	Less necessary	Necessary	Very necessary	SD
Outputs/impacts from the implementation of the cooperation program	0.00%	0.00%	11.11%	44.44%	44.44%	0.23
The level of usefulness of the cooperation program carried out (at campus or at business and industrial world)	0.00%	0.00%	11.11%	27.78%	61.11%	0.26
The suitability of the impact of the implementation of the cooperation program are carried out with the goals of the Institution (at campus or at business and industrial world)	0.00%	0.00%	22.22%	44.44%	33.33%	0.20
The level of effectiveness of the implementation of the cooperation program carried out (at campus or at business and industrial world)	0.00%	0.00%	33.33%	38.89%	27.78%	0.19
The level of efficiency of the implementation of the cooperation program carried out (at campus or at business and industrial world)	0.00%	0.00%	38.89%	38.89%	22.22%	0.19
The benefits of cooperation programs carried out to the community (at campus or at business and industrial world)	0.00%	0.00%	27.78%	27.78%	44.44%	0.19
The success of the product/outcome of the collaboration program was conducted for the design of future/next programs (at campus or at business and industrial world)	0.00%	0.00%	11.11%	66.67%	22.22%	0.28



Statement	Very unnecessary	Unnecessary	Less necessary	Necessary	Very necessary	SD
Improving the ability/skills/innovation of the implementers of the cooperation program (at campus or at business and industrial world)	0.00%	0.00%	5.56%	44.44%	50.00%	0.25

The 9 key factors exist that link and match the relationship between technical and vocational education and training with industrial needs in Indonesia [3], [35]:

a) *Policy and strategy*: TVET users and operators must link and match with policies and strategies in increasing the effectiveness and efficiency of the TVET system in Indonesia. In ensuring stakeholders know and understand their capabilities, it is necessary to have the right strategy so that it will produce effective and efficient work results. Vocational students will be exposed to the requirements and future impacts on their jobs. They must develop their competencies to suit the needs of Industry 4.0, for example, handling digital devices and software, information literacy, implementing digital security, digital collaboration skills, and digital problem-solving skills. [36].

b) *Curriculum*: The curriculum is designed by the TVET institution by involving stakeholders (industry) and implemented according to industry needs, and the curriculum must also be continuously evaluated and updated regularly according to developments in science and technology. globalization, the development of learning methods, and the needs of the world of work in industry and global developments (industrial revolution). With the involvement of stakeholders in the curriculum review, it is hoped that schools can prepare their graduates as a highly competent workforce both in terms of adaptive knowledge and skills.

c) *Learning and teaching*: In accommodating the diversity of students' needs and learning styles, TVET institutions should design various adaptive and flexible learning methods, such as: Case-Based Learning, Work-Based Learning, Project-Based Learning, and Blended Learning.

d) *Partnership*: The role of partnerships is central to the success of TVET institutions. Collaboration between TVET institutions and industry will affect national economic growth. the forms of this partnership include: developing and revising curricula, fieldwork, industry experts who become resource persons/guest lecturers, seminars/joint workshops between TVET institutions and industry, student internships, training and upgrading the skills of industry staff at TVET institutions, and conducting collaboration in research. all of that

as a strategy in increasing the strength of each. Strong partnerships will help alleviate poverty by reducing labor and skills mismatches [37]. Better skills development will enable students to engage in income-generating opportunities, which can include employment by industry and the world of work [38]. School partnerships with industry can increase learning effectiveness [39]. The main goal of the ISP (School-Industry Partnership) is to facilitate the transition from school to the world of work [40]. Collaboration can make skill development flexible to survive in a rapidly changing global economy and technological innovation [41].

e) *Accreditation*: To maintain the quality and relevance of TVET institutions in accordance with the needs of the labor market and industry, it is necessary to have a professional accreditation agency as an external quality assurance agency. Accreditation as a form of monitoring and evaluation in increasing the reliability of vocational education programs, so that the quality of education carried out at TVET institutions will produce a reliable workforce and able to compete and be recognized at the global level.

f) *Funding and quality management*: Finance is an important factor in the sustainability of the TVET program. Good funds for developing learning infrastructure and facilities will support the success of educational goals. need good managerial and professionals in financial management. Additionally, it is also necessary to optimize cooperation with industry, so that the distribution of resources and their management will be optimal.

g) *Teacher and staff development*: development of teachers and staff as human resources is needed. This is intended to ensure the continuity and sustainability of learning services. This development model includes: short training/courses, further studies, workshops, seminars, apprenticeships, and others.

h) *Academic culture and atmosphere*: In developing good academic atmosphere, schools must provide excellent service through the development of soft skills according to industry needs. Economic growth depends on skilled human resources, where vocational education plays a critical role in providing it [42], [36]. The focus in the educational process at TVET is on aspects of work culture and OSH, where

knowledge, attitudes, and skills influence the success of a job according to the area of expertise. Besides, it is also necessary to add skills to the organizational context as an organizational culture.

i) *Facilities and infrastructure:* TVET institutions must provide infrastructure and facilities to support the learning process, such as workshops, laboratories, practical equipment, and tools according to industry demands. Not a few TVET institutions in Indonesia have not met the minimum standards in providing learning infrastructure and facilities for theory and laboratories for practice.

#### IV. DISCUSSION

SMKN 1 Boyolangu Tulungagung and PGRI Vocational High School Singosari Malang previously carried out evaluation of the link and match implementation between vocational high school (SMK) and industrial partners [43]. However, the evaluation model used is CIPP (Context, input, process, product). [44] also conducted similar studies, choosing the CIPP model in industrial practice programs at SMK. The selection of this model is based on the workings of the CIPP model evaluation, which considers the evaluation as a system, and the accuracy of using the evaluation model for a processing program such as developing student skills. Additionally, researchers can evaluate all aspects of implementing industrial practice programs. Other studies have added an outcome component, as [45] and [46], Development Evaluation Instruments of Vocational Chemistry Analysis Curriculum for 4 Years Experience Using Cippo Model.. This model is the CIPP evaluation model from Stufflebeam refined by Gilbert Sax. The evaluation of a program requires an evaluation of the results, how successful graduates are at work. Therefore, to obtain comprehensive evaluation results, the CIPPO evaluation model is needed so that it can be used as advocacy material for policy makers.

The CIPPO evaluation model can provide a real picture of the conditions that occur in programs implemented in vocational education and can be the basis for providing recommendations for solutions given to the constraints contained in the four dimensions contained in the model (context, input, process, product, output). However, the implementation of evaluation activities is not only emphasized the model used but also on the evaluator and accuracy of the program with the subject that is used as a source of information, to provide an in-depth analysis of the problems that need to be

corrected [47]. In that context, the leadership and management of vocational education institutions play an important role in ensuring curriculum development and its implementation in the learning process to establish a link and match with the demands of the world of work. In the context of developing a vocational education curriculum, the function of management and leadership is to ensure the implementation of links and matches, both in the curriculum design process and its implementation in the learning process in the classroom, workshops/laboratories, and in the industry through field work practices and internships [48].

The link and match program must be in all vocational high schools because it has been proven to have a positive impact, especially from the implementation of the expert teacher program within the link and match framework of vocational schools and industry. These benefits include many SMK alumni recruited by industry, SMK can easily adapt to developments in the industrial world, increasing cooperation between SMK and companies, SMK get regular books and magazines from companies, SMKs can take part in zoom classes held regularly by companies, adding knowledge and always updating according to developments, preparing students to be able to adapt to the world of work, and increasing cooperation between Vocational Schools and companies [49] [50].

#### V. CONCLUSION

This paper is novel because it seeks to contribute to the current debate in the literature on the development of the CIPPO model evaluation instrument for evaluating vocational education programs. The scientific novelty of this article also consisted of a large-scale study that describes the theoretical and practical prerequisites of the author. The results of the study indicate that there is a need for a CIPPO evaluation model in which context, input, and product aspects are very much needed, while the outcome aspect is needed in improving the quality of cooperation programs between SMKs and industry from the perspective of vocational schools in West Java, Indonesia. It is necessary to conduct further research that refers to the industrial perspective. The results of this research can be developed into an electronic evaluation application that can be used to assist the duties of the Directorate General of Vocational Education, Ministry of Education and Culture of the Republic of Indonesia. Furthermore, this research can serve as a model for institutions outside Indonesia, such as SEA-TVET, a consortium of

TVET officials from Southeast Asian countries, where one of its main programs is to strengthen partnerships between TVET institutions and the industrial sector.

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