

Evaluation of the Implementation of the Teaching Factory Policy Using the CIPP Model at State Vocational High Schools in Pariaman City

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Abstract

This study aimed to evaluate the implementation of the Teaching Factory (TeFa) policy in the Culinary Expertise Program at SMK Negeri 2 Pariaman using the Context, Input, Process, Product (CIPP) model. A concurrent embedded mixed-methods design was employed, involving 33 Grade XII students selected through census sampling and five key informants selected purposively. Quantitative data were collected through a questionnaire and analyzed using descriptive statistics, while qualitative data from interviews, observations, and documentation were analyzed through data reduction, data display, and conclusion drawing; both strands were subsequently merged for interpretation. The findings showed that Context (75.13%), Input (74.39%), and Process (74.04%) were categorized as good, whereas Product (78.79%) was categorized as very good. Qualitative evidence corroborated the quantitative results by showing that TeFa supported production-based learning, student involvement in authentic work processes, work readiness, and entrepreneurial development. Nevertheless, implementation remained constrained by limited dedicated production space, insufficient industry-standard equipment, restricted productive-teacher capacity, suboptimal industry partnerships, and underdeveloped digital marketing and evaluation systems. These findings indicate that the CIPP framework provides a comprehensive basis for identifying both strengths and implementation gaps in school-based Teaching Factory policy. Given the study's single-school scope, reliance on student perceptions, predominantly internal informants, and limited observation and documentation, future research should involve multiple vocational schools and stronger participation from industry stakeholders.

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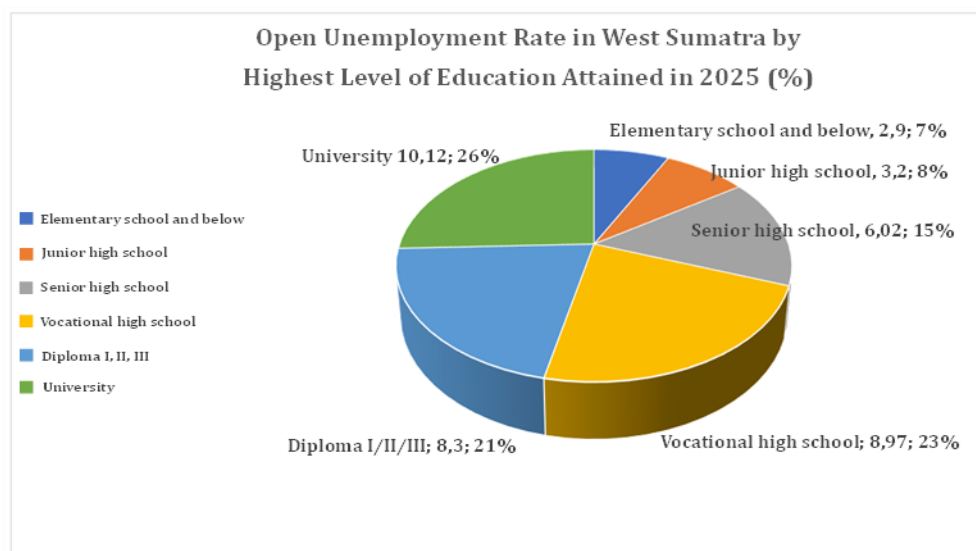


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Introduction

Vocational education plays a strategic role in preparing competent, adaptive human resources that meet the needs of the workforce (Calero López, & Rodríguez-López, 2020; Muharam et al., 2025). In Indonesia, Vocational High Schools are designed to produce graduates with professional competencies, enabling them to enter the business and industrial world, become entrepreneurs, or pursue higher education. However, the main challenge facing vocational education in Indonesia remains the high unemployment rate among vocational high school graduates, indicating a suboptimal link (*link and match*) between graduate competencies and industry needs (Triani et al., 2025). Based on data from the Central Statistics Agency of West Sumatra Province in 2025, vocational high school graduates ranked second in the open unemployment rate based on educational level (Syarli & Sari, 2026). This data is presented in Figure 1, which shows the Open Unemployment Rate by educational level.

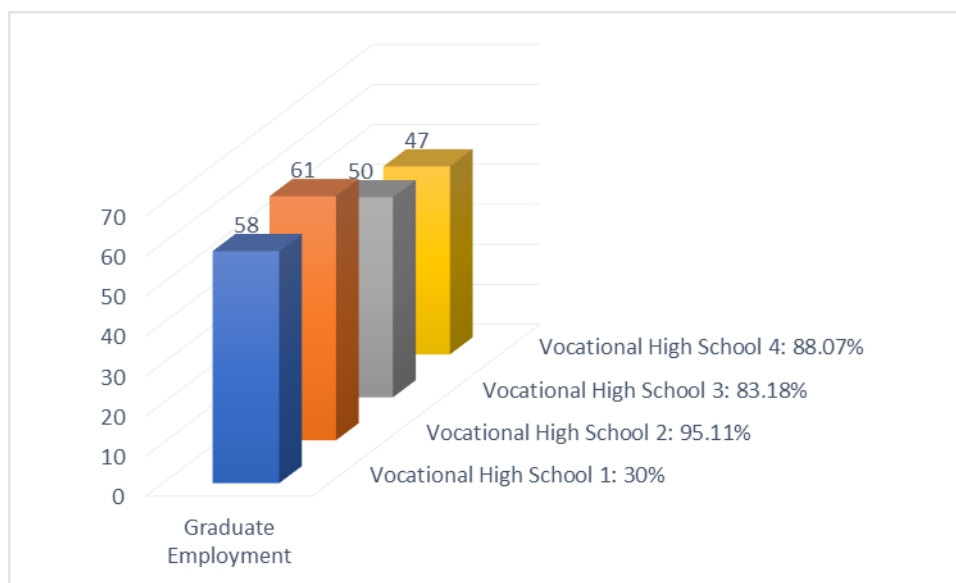


Source: Data from the West Sumatra Central Statistics Agency, February 2025

Figure 1. Open Unemployment Rate in West Sumatra by Highest Level of Education

Figure 1 indicates that there is still a gap between the goals of vocational education and the reality of graduate absorption in the workforce. In an effort to improve the quality of vocational education graduates, the government is implementing a policy Teaching Factory (TeFa) As one of the strategies for revitalizing vocational education, as mandated by Presidential Regulation Number 68 of 2022 concerning the Revitalization of Vocational Education and Training, the Teaching Factory is a production-based learning model that integrates the learning process with real-world work practices, enabling students to gain experiences that mimic industrial conditions (Wang, 2023; Yang et al., 2023). Implementation of this policy is expected to improve technical competency and soft skills, as well as strengthen the relationship between schools and the industrial and business sectors, thus enabling graduates to be more competitive in the job market (Dogara et al., 2020).

In Pariaman City, all state vocational schools have implemented Teaching Factory programs, but their effectiveness has shown mixed results (Saputro et al., 2021; Yamin, 2026). The 2025 Education Report found that all state vocational schools in Pariaman City experienced a decline in the quality of their Teaching Factory implementation by an average of 15.29%. Furthermore, there is a gap between the quality of Teaching Factory implementation and the rate of graduate absorption (Syafmaini et al., 2025; Elfira et al., 2026). For example, SMK Negeri 1 Pariaman achieved a Teaching Factory score of 58 but only absorbed 30% of its graduates, while SMK Negeri 2 Pariaman achieved a score of 61 with a graduate absorption rate of 95.11%. This situation indicates that the quality of program implementation is not always directly proportional to the success of graduate absorption. The data presented in Figure 2 confirms the disparity between the quality of Teaching Factory implementation and graduate absorption, necessitating a more comprehensive evaluation of policy implementation.



Source: 2025 Education Report for State Vocational High Schools in Pariaman City

Figure 2. Tefa Data for Pariaman City Public Vocational High School

This phenomenon indicates that the success of the Teaching Factory is not only influenced by the final program achievements, but also by the appropriateness of the policy context, resource readiness, the quality of the implementation process, and the resulting results (Wijanarka et al., 2023; Endang & Kuat, 2023). A preliminary study at SMK Negeri 2 Pariaman found that the Culinary Teaching Factory program has been running since 2018 and has a fairly good production orientation, but still faces various obstacles, such as the suboptimal separation of practice and production spaces, limited product marketing, increasing production costs due to rising raw material prices, and financial management through the Regional Public Service Agency (Kurniati, 2021; Junelti et al., 2026). These various conditions indicate a gap between the implementation of ideal policies and practices in the field, so that an evaluation is needed that can comprehensively identify the causal factors.

Although the implementation of Teaching Factory has been widely studied in the vocational education literature, most research focuses on measuring learning effectiveness, improving student competency, managing production units, or measuring satisfaction with program implementation. These studies generally do not provide a comprehensive picture of the implementation of the Teaching Factory policy as a system involving the interrelationships between the policy context, resource readiness, implementation processes, and program outcomes (Pradipta et al., 2021; Imran et al., 2024; Rifai et al., 2026). Furthermore, previous research has predominantly used separate quantitative or qualitative approaches, thus failing to integrate objective and subjective findings to explain the factors influencing the success and challenges of policy implementation. Empirically, there is limited research evaluating the implementation of Teaching Factory in vocational high schools in developing regions, particularly in Pariaman City, which has different resource characteristics, industry partnerships, and implementation challenges than more developed industrial areas (Xu et al., 2022; Liu, 2022; Kerr & Marcos-Cuevas, 2022).

Therefore, this study aims to evaluate the implementation of the Teaching Factory policy at SMK Negeri 2 Pariaman using the Context, Input, Process, Product (CIPP) model developed by Stufflebeam, this study also offers a novel approach through the evaluation of the implementation of the Teaching using the Context, Input, Process, Product (CIPP) model with a mixed-methods

approach that integrates quantitative and qualitative data. This approach is expected to yield a more comprehensive evaluation, identify factors influencing the success of implementation across each CIPP component, and generate more appropriate policy recommendations to support the improvement of vocational education quality and the strengthening of partnerships between schools and the business and industrial sectors. It is hoped that this research will provide evidence-based recommendations for schools, local governments, and stakeholders to improve the effectiveness of Teaching Factory implementation, thereby producing vocational high school graduates who are more competent, adaptable, and aligned with the needs of the workforce.

Method

This study uses a mixed methods approach with a Concurrent Embedded Design, where quantitative and qualitative data are collected simultaneously, but quantitative data is the primary approach, while qualitative data is used to strengthen, explain, and interpret quantitative results (Chang & Chen, 2020; Kalil et al., 2023; Bastable et al., 2023 Rahman et al., 2024). Evaluation of the implementation of the Teaching Factory policy was conducted using the Context, Input, Process, Product (CIPP) model developed by Stufflebeam because it is able to provide a comprehensive picture of the suitability of the policy context, resource readiness, implementation process, and program achievements (Sunaryo et al., 2021; Santiyadnya, 2021). The research flow can be seen in Figure 3 in the form of a diagram of the research stages which include determining the research focus, collecting quantitative and qualitative data simultaneously, analyzing each data, integrating the results (*mixing data*), as well as the preparation of policy recommendations.

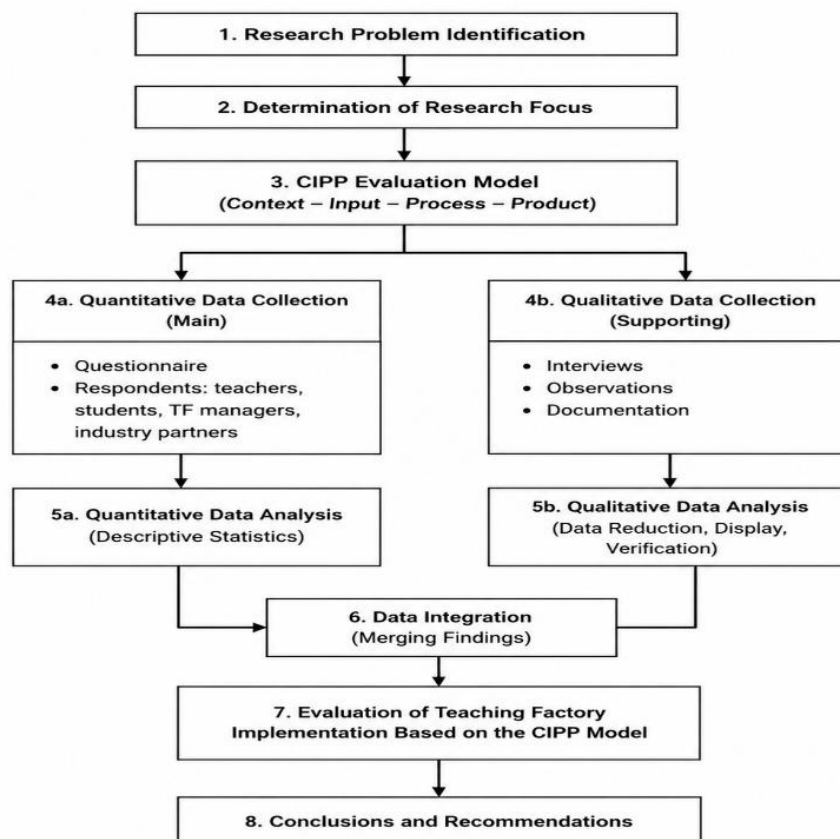


Figure 3. Research flowchart for Concurrent Embedded Mixed Methods using the Context, Input, Process, Product (CIPP) evaluation model.

The research was conducted in the Culinary Expertise Program at SMK Negeri 2 Pariaman. The research population and sample can be seen in Table 1, which contains data sources, population size, sampling technique, and sample size.

Table 1. Population and Sample of the Study

No.	Data Source	Population	Sampling Technique	Sample
1	Grade XII students of the Culinary Expertise Program (questionnaire respondents)	33 participants	Census Sampling (Total Sampling)	33 participants
2	Key informants: Principal, Vice Principal for Curriculum, Vice Principal for Industrial Relations (DUDI), Productive Teacher, and Teaching Factory Coordinator (interview participants)	5 participants	Purposive Sampling	5 participants

Source: Prepared by the authors (2025).

The indicators for each CIPP evaluation dimension can be presented in Table 2 so that readers can obtain an operational overview of the research variables.

Table 2. Dimensions and Indicators of the CIPP Evaluation Model

Dimension	Indicators
Context	Program objectives, policy support, school readiness, industry needs, stakeholder commitment.
Input	Human resources, curriculum, facilities, equipment, budget, industrial partnership, SOP.
Process	Learning implementation, production process, supervision, monitoring, quality control, marketing, evaluation.
Product	Student competencies, product quality, work readiness, entrepreneurial skills, customer satisfaction, graduate employability.

Source: Adapted from Stufflebeam's CIPP Evaluation Model and developed by the researchers (2025).

Quantitative data analysis was conducted using descriptive statistics in the form of average values, percentages, and assessment categories for each CIPP component. Qualitative data were analyzed through the stages of data reduction, data presentation, and drawing conclusions following the Miles, Huberman, and Saldana model. Furthermore, both types of data were integrated using merging techniques to compare, confirm, and explain quantitative findings through qualitative evidence to obtain a complete interpretation of the implementation of the Teaching Factory policy. Data validity was ensured through source triangulation, technical triangulation, and data validation. *Member checking*, as well as discussions with colleagues to increase the credibility and consistency of research results.

Result and Discussion

Quantitative Research Results

Instrument Validity Test

Validity testing was conducted using the Pearson Product Moment correlation to determine the ability of each statement item to measure the research construct. Validity criteria were determined based on the calculated *r* value > *r* table at a significance level of 5%. With 20 trial respondents, the *r* table value was obtained at 0.444. The results of the instrument validity test for each component of Context, Input, Process, and Product (CIPP) are presented in Table 3.

Table 3. Results of Instrument Validity Test

Components	Item	Calculated r value	Table r value	Conclusion
Context	A1	0,800	0,444	Valid
	A2	0,531	0,444	Valid
	A3	0,781	0,444	Valid
	A4	0,905	0,444	Valid
	A5	0,542	0,444	Valid
	A6	0,561	0,444	Valid
Input	B1	0,829	0,444	Valid
	B2	0,629	0,444	Valid
	B3	0,727	0,444	Valid
	B4	0,838	0,444	Valid
	B5	0,510	0,444	Valid
	B6	0,569	0,444	Valid
	B7	0,502	0,444	Valid
	B8	0,729	0,444	Valid
	B9	0,829	0,444	Valid
	B10	0,737	0,444	Valid
Process	C1	0,853	0,444	Valid
	C2	0,898	0,444	Valid
	C3	0,816	0,444	Valid
	C4	0,839	0,444	Valid
	C5	0,521	0,444	Valid
	C6	0,778	0,444	Valid
	C7	0,532	0,444	Valid
	C8	0,585	0,444	Valid
	C9	0,769	0,444	Valid
	C10	0,602	0,444	Valid
	C11	0,715	0,444	Valid
Product	D1	0,588	0,444	Valid
	D2	0,646	0,444	Valid
	D3	0,635	0,444	Valid
	D4	0,730	0,444	Valid
	D5	0,711	0,444	Valid
	D6	0,885	0,444	Valid
	D7	0,626	0,444	Valid
	D8	0,751	0,444	Valid
	D9	0,852	0,444	Valid
	D10	0,774	0,444	Valid
	D11	0,788	0,444	Valid
	D12	0,909	0,444	Valid
	D13	0,770	0,444	Valid

Based on Table 3, all statement items in the Context, Input, Process, and Product (CIPP) component have a calculated r value greater than the table r (0.444). This indicates that all 40 statement items

are valid and capable of measuring the aspects evaluated in the implementation of Teaching Factory. Thus, all instrument items are suitable for use in data collection in this study.

Instrument Reliability Test

After all items were declared valid, a reliability test was conducted using Cronbach's Alpha to determine the instrument's internal consistency. An instrument is considered reliable if its Cronbach's Alpha value is > 0.70. The results of the instrument reliability test for each component of Context, Input, Process, and Product (CIPP) are presented in Table 4.

Table 4. Results of Instrument Reliability Test

Variable	Cronbach's Alpha	Number of Items	Conclusion
Context	0,733	6	Reliable
Input	0,855	10	Reliable
Process	0,894	11	Reliable
Product	0,929	13	Reliable

Based on Table 4, all evaluation components had Cronbach's Alpha values ranging from 0.733 to 0.929, thus all research constructs were declared reliable. These results indicate that the instrument has a good level of internal consistency and is suitable for measuring the implementation of the Teaching Factory in the Culinary Expertise Program at SMK Negeri 2 Pariaman.

Descriptive Statistics

Context

The Context component was used to evaluate the suitability of the objectives, needs, and conditions of the Teaching Factory implementation in the Culinary Expertise Program at SMK Negeri 2 Pariaman. The results of the descriptive statistical analysis are presented in Table 5.

Table 5. Descriptive Statistics of the Context Component

Code	Indicator	Mean	Percentage	Category
A1	Understanding the objectives of Teaching Factory as an industry-based learning model	3.33	83.33%	Very Good
A2	Alignment of Teaching Factory activities with culinary industry work procedures	3.39	84.85%	Very Good
A3	Adequacy of the initial explanation regarding Teaching Factory activities and regulations	2.73	68.18%	Good
A4	Clarity of school information regarding the objectives, procedures, and regulations of Teaching Factory	3.21	80.30%	Very Good
A5	Understanding of the Teaching Factory workflow from production to product marketing	3.21	80.30%	Very Good
A6	School's active dissemination of the objectives and benefits of Teaching Factory	2.15	53.79%	Good
Overall	Context Component	3.01	75.13%	Good

Source: Processed research data (2025).

Based on Table 5, the Context component obtained an average score of 3.01, with a percentage of 75.13%, thus categorizing it as Good. These results indicate that the implementation of Teaching Factory has a program foundation that aligns with industry-based learning objectives and is well understood by students.

The indicator with the highest score was the suitability of Teaching Factory activities with culinary industry work procedures (A2) with an average of 3.39 (84.85%), followed by understanding the objectives of Teaching Factory as industry-based learning (A1) with an average of 3.33 (83.33%). Conversely, the indicator of school activeness in conveying the objectives and benefits of Teaching Factory (A6) obtained the lowest score, namely 2.15 (53.79%), which indicates that the program socialization aspect still needs to be improved. Overall, the evaluation results show that the Context component has been running well. However, schools need to improve the delivery of information regarding the objectives, benefits, and implementation mechanisms of Teaching Factory so that all students have a more comprehensive understanding of the program.

Input

The Input component evaluates the readiness of resources to support the implementation of the Teaching Factory in the Culinary Expertise Program at SMK Negeri 2 Pariaman. The evaluated aspects include human resources, facilities and infrastructure, raw materials, and the suitability of learning materials to industry needs. The results of the descriptive statistical analysis of the Input component are presented in Table 6.

Table 6. Descriptive Statistics of the Input Component

Code	Indicator	Mean	Percentage	Category
B1	Teachers' ability to explain culinary production techniques	3.36	84.09%	Very Good
B2	Teachers' feedback on students' work performance	2.27	56.82%	Good
B3	Students' motivation and commitment in participating in Teaching Factory activities	3.36	84.09%	Very Good
B4	Availability of kitchen/workshop equipment to support culinary production	3.03	75.76%	Good
B5	Condition of practical equipment (clean, functional, and suitable for use)	3.39	84.85%	Very Good
B6	Availability of workshop equipment for Teaching Factory activities	2.09	52.27%	Good
B7	Availability of raw materials according to production needs and schedule	2.09	52.27%	Good
B8	Availability of production materials according to the activity schedule	3.12	78.03%	Very Good
B9	Comfort and cleanliness of the Teaching Factory workshop	3.39	84.85%	Very Good
B10	Relevance of Teaching Factory learning materials to production, packaging, marketing, and customer service	3.64	90.91%	Very Good
Overall	Input Component	2.98	74.39%	Good

Source: Processed research data (2025).

Based on Table 6, the Input component obtained an average score of 2.98 with a percentage of 74.39%, thus being categorized as Good. This result indicates that the resources supporting the implementation of the Teaching Factory are well available, although there are still several aspects that need to be improved. The indicator with the highest score is the suitability of Teaching Factory materials with production, packaging, marketing, and customer service activities (B10) with an average of 3.64 (90.91%), followed by the condition of practical equipment (B5) and the comfort of the practical room (B9) which each obtained an average of 3.39 (84.85%). In contrast, the indicators

for the availability of workshop equipment (B6) and the availability of raw materials according to production needs (B7) obtained the lowest scores, namely 2.09 (52.27%), while the provision of teacher feedback on student work results (B2) is also still relatively low with an average of 2.27 (56.82%). Overall, the evaluation results indicate that the Input component has supported the implementation of the Teaching Factory well. However, improvements in the availability of equipment, raw materials, and the provision of feedback by teachers are needed so that program implementation can be more effective and in accordance with the needs of industry-based learning.

Process

The Process component evaluates the implementation of the Teaching Factory in the Culinary Expertise Program at SMK Negeri 2 Pariaman, including the industry-based learning process, implementation of work procedures, student involvement, and teacher mentoring during the activity. The results of the descriptive statistical analysis of the Process component are presented in Table 7.

Table 7. Descriptive Statistics of the Process Component

Code	Indicator	Mean	Percentage	Category
C1	Implementation of Teaching Factory production stages from preparation to product marketing	3.39	84.85%	Very Good
C2	Implementation of Teaching Factory activities according to the planned schedule	2.21	55.30%	Good
C3	Consistency of the Teaching Factory activity schedule	3.21	80.30%	Very Good
C4	Students' active participation in all stages of production and marketing	3.06	76.52%	Very Good
C5	Equal opportunities for students to participate in Teaching Factory activities	2.76	68.94%	Good
C6	Implementation of Standard Operating Procedures (SOP) and Occupational Health and Safety (OHS) during Teaching Factory activities	3.52	87.88%	Very Good
C7	Integration of classroom theory with Teaching Factory practice	3.36	84.09%	Very Good
C8	Students' ability to apply theoretical knowledge in production activities	3.39	84.75%	Very Good
C9	Teachers' supervision during the production process	2.24	56.06%	Good
C10	Evaluation and discussion of students' work with teachers	3.33	83.33%	Very Good
C11	Teachers' feedback and guidance on students' work performance	3.39	84.85%	Very Good
Overall	Process Component	2.96	74.04%	Good

Source: Processed research data (2025).

Based on Table 7, the Process component obtained an average score of 2.96 with a percentage of 74.04%, so it is in the good category. These results indicate that the implementation of the Teaching Factory has been running according to the stages of industry-based learning, although there are still several aspects that need to be improved. The indicator with the highest score is the implementation of Standard Operating Procedures (SOP) and Occupational Health and Safety (OHS) during Teaching Factory activities (C6) with an average of 3.52 (87.88%). In addition, the implementation of production stages (C1), students' ability to apply theory in practice (C8), and teacher feedback on student work results (C11) also received the Very Good category. Conversely,

the indicator for implementing activities according to schedule (C2) obtained the lowest score with an average of 2.21 (55.30%), followed by teacher mentoring during the production process (C9) with an average of 2.24 (56.06%). Overall, the evaluation results show that the Teaching Factory implementation process has been running well. However, the management of activity schedules and the intensity of teacher support during the production process still need to be improved so that program implementation becomes more effective and provides an optimal learning experience for students.

Product

The Product component evaluates the results achieved after implementing the Teaching Factory in the Culinary Expertise Program at SMK Negeri 2 Pariaman. The evaluation focuses on improving student competency, including technical skills (*hard skills*), non-technical skills (*soft skills*), entrepreneurial skills, work readiness, and satisfaction with program implementation. The results of the descriptive statistical analysis of the Product component are presented in Table 8.

Table 8. Descriptive Statistics of the Product Component

Code	Indicator	Mean	Percentage	Category
D1	Improvement in food preparation and cooking skills after participating in the Teaching Factory	3.27	81.82%	Very Good
D2	Improvement in cooking and food processing competence after participating in the Teaching Factory	2.27	56.82%	Good
D3	Ability to operate kitchen equipment skillfully and confidently	3.18	79.55%	Very Good
D4	Ability to calculate production costs and determine product selling prices	3.24	81.06%	Very Good
D5	Ability to work collaboratively and take responsibility within a team	3.39	84.85%	Very Good
D6	Improvement in discipline, punctuality, and work responsibility	2.36	59.09%	Good
D7	Increased self-confidence in culinary entrepreneurship	3.42	85.61%	Very Good
D8	Interest and confidence in starting a culinary business after graduation	3.30	82.58%	Very Good
D9	Readiness to work in the culinary industry after participating in the Teaching Factory	3.33	83.33%	Very Good
D10	Satisfaction with the implementation of the Teaching Factory program	3.27	81.82%	Very Good
D11	Perceived benefits of the Teaching Factory program	3.18	79.55%	Very Good
D12	Customer acceptance of products produced through the Teaching Factory	3.33	83.33%	Very Good
D13	Students' ability to produce products that meet customer standards	3.39	84.85%	Very Good
Overall	Product Component	3.15	78.79%	Very Good

Source: Processed research data (2025).

Based on Table 8, the Product component obtained an average score of 3.15 with a percentage of 78.79%, so it is included in the Very Good category. These results indicate that the implementation of Teaching Factory has a positive impact on improving student competencies, especially in the aspects of skills, work readiness, and entrepreneurial abilities. The indicator with the highest score

is increased self-confidence in culinary entrepreneurship (D7) with an average of 3.42 (85.61%), followed by the ability to work together in a team (D5) and the ability to produce products according to consumer standards (D13) which each obtained an average of 3.39 (84.85%). Conversely, the indicator for improving cooking and food processing skills (D2) obtained the lowest score with an average of 2.27 (56.82%), followed by increased discipline, punctuality, and work responsibility (D6) with an average of 2.36 (59.09%). Overall, the evaluation results show that the Product component is in the Very Good category. However, improving technical competency and strengthening work culture, such as discipline and responsibility, still needs attention so that graduates are better prepared to meet the demands of the industrial world.

Qualitative Analysis Results

Interview Results

The results of interviews with the Principal, Vice Principal for Curriculum, Vice Principal for Public Relations, Person in Charge of Teaching Factory (TeFa), and Productive Teachers indicate that the implementation of the Culinary Teaching Factory at SMKN 2 Pariaman has been running well and is supported by the commitment of all school residents. Based on the analysis using the Context, Input, Process, Product (CIPP) model, it is clear that the Teaching Factory program has become part of the school's strategy in improving student competencies to suit the needs of the business and industrial world.

In the Context component, all speakers stated that Teaching Factory is a program that aims to connect learning in schools with the world of work through the concept *link and match*. This program has been integrated into the Independent Curriculum through curriculum alignment with the Industrial and Industrial Industries and supported by school policies. Furthermore, the products developed are tailored to market needs and regional potential, thus offering marketable opportunities. As one resource person explained,

"What drives the implementation of TeFa is to reduce the gap between students' knowledge and skills and the needs of the (industrial and industrial) world."

In the Input component, interview results indicated that the implementation of the Teaching Factory is supported by productive teachers, learning tools, production SOPs, a block learning system, and collaboration with several industry partners. However, all interviewees agreed that there are still limitations in facilities and infrastructure, particularly the lack of dedicated production space, limited industry-standard equipment, and a limited number of productive teachers. One interviewee stated,

"Learning uses a block system so that it does not clash with regular teaching and learning activities."

In the Process component, all informants explained that the implementation of the Teaching Factory begins with activity planning, raw material procurement, the production process according to SOPs, and product marketing. Students are directly involved in all stages of production, thus gaining work experience that approximates industrial conditions. Assessment is carried out through projects, portfolios, and the Skills Competency Test. However, program implementation still faces obstacles such as limited production space and equipment, suboptimal involvement of (industrial industry), and still-simplified product marketing. As stated by the informant,

"The entire production process is carried out according to SOP with direct involvement of students."

In the Product component, all sources stated that the Teaching Factory had a positive impact on improving student competency, both in terms of technical skills (*hard skills*) and work attitude (*soft skills*), such as discipline, responsibility, cooperation, creativity, and independence. This program also improves graduates' job readiness, accelerates their absorption into the workforce, and encourages entrepreneurial interest. The resulting products have received positive feedback from the public due to their high quality, hygiene, and suitability to consumer needs. One resource person stated,

"On average, graduates get a job within one to two months after graduation, some are even recruited directly after their internship."

Overall, interview results indicate that the implementation of the Culinary Teaching Factory at SMKN 2 Pariaman has been successful and has benefited the quality of learning and graduate readiness. The program's success is supported by the commitment of school leaders, teachers, and administrators, as well as the high level of public trust in the Teaching Factory's products. However, improvements to facilities and infrastructure, the addition of productive teaching staff, strengthening teacher competencies through industry training and internships, expanding partnerships with the Industrial and Industrial Industries, and developing marketing strategies are still needed to ensure the Teaching Factory can develop as a professional and sustainable school production unit.

Observation Results and Documentation

Observations and documentation studies indicate that the implementation of the "Maichin" Culinary Teaching Factory (TeFa) at SMKN 2 Pariaman has been running well and is supported by both implementation and program administration aspects. Observations show that basic production facilities are available and optimally utilized, students are actively involved in all stages of production with teacher guidance, and have implemented sanitation, occupational safety, and the use of personal protective equipment. The resulting products have also been marketed through the school canteen and direct orders. Meanwhile, documentation studies indicate institutional support through management decrees, the Merdeka Curriculum integrated with TeFa, financial reports, cooperation documents with, graduate tracer study data, and student competency certificates that indicate TeFa's contribution to improving graduate competency and absorption. However, there are still several aspects that need to be improved, including the provision of a dedicated production space, additional equipment according to industry standards, optimization of digital marketing, preparation of written TeFa SOPs, updating cooperation documents with, inventory administration management, product and customer portfolio documentation, and strengthening the program evaluation system. Overall, the results of observations and documentation strengthen the interview findings that the implementation of the Teaching Factory has been carried out well, but still requires improvements in the aspects of facilities, administration, and partnerships to be more in line with industry standards and sustainable

Discussion

The findings demonstrate that the implementation of the Culinary Teaching Factory (TeFa) at SMK Negeri 2 Pariaman has achieved a generally favorable level of implementation, although the four CIPP dimensions reveal different degrees of maturity. The Context component reached 75.13%, Input 74.39%, and Process 74.04%, all categorized as *Good*, whereas the Product component obtained the highest score of 78.79% and was categorized as *Very Good*. This pattern is particularly important

because it indicates that the program has generated relatively strong learner- and product-oriented outcomes despite continuing limitations in several enabling conditions. At the contextual level, students understood the industry-oriented purpose of TeFa, but active dissemination of program objectives and benefits remained comparatively weak. At the input level, curriculum relevance and the condition of several practical facilities were positively perceived, while the availability of production equipment, raw materials, and teacher feedback required improvement. Similarly, the Process dimension demonstrated strong adherence to standard operating procedures and occupational safety, yet weaknesses remained in schedule consistency and teacher supervision. The Product results were more encouraging, particularly students' entrepreneurial confidence, teamwork, work readiness, and ability to produce products that meet consumer expectations; nevertheless, cooking competency and work discipline did not develop as strongly as the other outcomes. The convergence of questionnaire results with interviews, observations, and documentation therefore suggests that TeFa functions effectively as an authentic production-based learning environment, while simultaneously revealing structural bottlenecks that may constrain its sustainability.

These findings broadly correspond with international evidence on learning factories and work-integrated vocational education. Roll and Ifenthaler (2021a) found that Learning Factories 4.0 can strengthen subject-related technical competencies among vocational students, although the development of broader digital competencies was less consistent. Similarly, the scoping review by Reining and Kauffeld (2022) concluded that learning factories have considerable potential to promote professional, methodological, social, and self-competencies, but also emphasized that evaluation practices frequently rely heavily on self-report measures and require stronger methodological designs. The present findings extend this evidence into an Indonesian culinary vocational context: students experienced production procedures, customer-oriented production, occupational safety, teamwork, and entrepreneurship rather than merely learning technical content in conventional classrooms. However, unlike technologically intensive Learning Factory 4.0 environments, TeFa at SMK Negeri 2 Pariaman continues to experience constraints related to production space, industry-standard equipment, raw-material availability, and digital marketing. This contextual distinction is important because authentic vocational learning does not depend solely on exposing students to production activities; the quality and continuity of the production ecosystem also determine whether authentic learning can approximate contemporary workplace requirements.

A similar interpretation emerges from research on industry–education collaboration. Jamaludin et al. (2023), studying the Malaysian *Academy in Factory* model, identified weak curriculum structures and insufficient harmonization between industry and educational institutions as obstacles to effective implementation. Although curriculum integration appears comparatively stronger in the present study, insufficiently intensive DUDI involvement demonstrates that formal curricular alignment alone cannot guarantee sustained industry responsiveness. Gauthier (2023) likewise showed that industry advisory arrangements become less effective when industry actors are insufficiently integrated into academic decision-making or when their recommendations are not translated into operational changes. O'Regan et al. (2023) further demonstrated that employer-supported employability interventions can strengthen work-readiness outcomes, while Li et al. (2024) identified university–industry collaboration as an important mechanism associated with vocational students' perceived employability. Taken together, these studies provide a plausible

interpretation of the Pariaman results: the comparatively strong Product score may reflect successful school-level commitment and authentic production experience, but sustaining such outcomes requires the transition from occasional industry cooperation toward institutionalized co-design involving curriculum alignment, production standards, competency assessment, teacher development, and graduate transition.

The findings concerning teacher feedback, student participation, and digital development also deserve closer attention. Cao and Han (2024) found among Chinese vocational students that perceptions of feedback were associated with learning engagement through academic self-efficacy and anxiety-related mechanisms. Although their online-learning context differs from the face-to-face production setting examined here, the evidence reinforces the importance of systematic and timely teacher feedback, particularly because teacher feedback and supervision emerged as comparatively weak indicators in parts of the present evaluation. Chukwuedo et al. (2021) similarly demonstrated that self-directed vocational learning can strengthen engagement and lifelong-learning dispositions. Furthermore, digitalization should not be regarded simply as an administrative or promotional addition to TeFa. Roll and Ifenthaler (2021b) emphasized that vocational educators require multidimensional digital competence, while Adegbite (2024) showed that digital literacy can contribute to the relationship between work-integrated learning and employability. Consequently, expanding TeFa into digital product catalogues, customer-feedback systems, social-media marketing, digital inventory, and production documentation could provide students with opportunities to develop occupationally relevant digital capabilities rather than merely increasing product visibility.

Within Indonesia, the findings are highly consistent with previous Teaching Factory research. Dwijayanthi and Rijanto (2022) reported that TeFa implementation contributed to students' work readiness when supported by appropriate facilities, infrastructure, and industry participation. Wijanarka et al. (2023), using the CIPP framework in machining vocational schools, similarly demonstrated that successful TeFa implementation is multidimensional and depends on the interaction among program conditions, resources, implementation, and outputs. Pradipta et al. (2021), however, showed that Indonesian vocational revitalization can face a persistent gap between formal policy intentions and actual industry participation, closely reflecting the current study's concern regarding the optimization of DUDI partnerships. Rosidah and Sutirman (2023) further found that Teaching Factory experiences produced added value in knowledge, skills, attitudes, self-confidence, motivation, independence, responsibility, and occupational readiness. These Indonesian findings reinforce the interpretation that production-based learning is valuable not merely because it produces marketable goods, but because it situates technical learning within occupational routines and authentic responsibility.

More recent Indonesian evidence provides additional support while also extending the interpretation. Hamlaini (2026) developed a CIPPO-based Teaching Factory model and reported improvements in employability skills and creativity, suggesting the value of extending evaluation beyond immediate Product indicators toward longer-term Outcomes. Similarly, Larasati et al. (2026) found that both teachers' pedagogical competence and sustainable school-industry partnerships were significantly associated with vocational graduate employability. These results are particularly relevant because the present study identified both teacher-related and DUDI-related areas requiring further strengthening. In addition, Waluyo et al. (2025), including research from the specified author profile, demonstrated how a digital teacher-performance assessment system can connect vocational

teacher development with industry competency frameworks. Rokhman et al. (2024) likewise emphasized structured supervision as a mechanism for strengthening professional competence. In the digital-learning literature requested for this revision, Hariandini et al. (2026) showed that the educational value of technology depends not merely on technological availability but also on teachers' digital competence, pedagogical design, and institutional support, while Rasyid et al. (2025) reported increased engagement through appropriately designed digital media in an Indonesian vocational-school setting. Accordingly, digital marketing in TeFa should not be conceived only as a commercial strategy; it can also become a structured learning arena for digital communication, content production, customer interaction, platform literacy, and entrepreneurship.

Theoretically, the findings reinforce the usefulness of the CIPP model as an interconnected diagnostic framework rather than a checklist of four independent dimensions: the relatively stronger Product score does not eliminate weaknesses in Context, Input, and Process, but instead indicates that favorable immediate outcomes can coexist with resource and implementation constraints that may threaten long-term sustainability. This pattern suggests that future applications of CIPP should pay greater attention to cross-component relationships and, potentially, incorporate longer-term Outcome indicators through a CIPP/CIPPO orientation. Pedagogically, schools should strengthen repeated program socialization, stabilize block-production schedules, increase formative teacher feedback and supervision, rotate students across procurement, production, costing, quality control, packaging, marketing, customer service, and digital promotion, and integrate reflective evaluation after each production cycle. Digital marketing should additionally be designed as vocational digital-literacy training encompassing responsible online communication, content creation, customer-data awareness, information literacy, and digital entrepreneurship. From a policy perspective, school and local-government authorities should establish minimum standards for production space, industry-standard equipment, raw-material availability, teacher–student ratios, product-quality assurance, digital documentation, tracer studies, and customer-satisfaction systems, while DUDI partnerships should progress from formal agreements toward curriculum co-design, industry-based teacher training, joint competency assessment, product-standard validation, and graduate recruitment pathways. Importantly, this study did not directly measure students' mental health, online identity, social-media behavior, or emotional well-being as psychological constructs; therefore, no causal policy claims regarding these areas should be made. Their relationship with vocational digitalization constitutes a legitimate direction for subsequent research rather than a demonstrated implication of the present data.

The principal novelty of this study does not lie in using the CIPP model alone, since CIPP has previously been applied to Teaching Factory evaluation, but in combining CIPP with a concurrent embedded mixed-methods design to evaluate Culinary TeFa implementation as an integrated policy system in a developing regional context. By merging student-based quantitative evaluation with interviews, observation, and documentary evidence, the study exposes a theoretically and practically important pattern: stronger Product outcomes can emerge even when several contextual, resource, and process conditions remain only moderately established. This produces a more differentiated explanation than studies focusing exclusively on work readiness or program effectiveness. The study consequently contributes a context-sensitive evidence base for understanding how institutional commitment, authentic production learning, school resources, teacher support, industry partnerships, and emerging digital practices interact in the implementation of Indonesian Teaching

Factories. The contribution should nevertheless be interpreted as evaluative and explanatory rather than causal because the study design does not establish causal effects.

The findings should be interpreted in light of several limitations. The investigation involved only one Culinary Expertise Program in one vocational school, with 33 student respondents and five purposively selected key informants, most of whom represented internal school stakeholders. The quantitative evidence was predominantly perception-based, while observation and documentary evidence were limited in scope; consequently, the favorable Product evaluation cannot be interpreted as objective proof of competency growth or employment effects. Yulfianti 2755 Yulfianti 2755 Future studies should therefore adopt multi-school and multi-program designs, incorporate external industry representatives and customers, use direct competency and product-quality assessments, and follow graduates longitudinally to measure employment, job retention, entrepreneurship, and employer satisfaction. Quasi-experimental or longitudinal mixed-methods designs could further determine whether TeFa participation produces measurable changes over time. Future evaluations may also extend CIPP toward CIPPO, integrate digital-marketing analytics and structured customer-feedback data, and investigate whether digitalized Teaching Factory environments influence students' digital literacy, engagement, career adaptability, and psychological well-being.

Conclusion

This study evaluated the implementation of the Culinary Teaching Factory at SMK Negeri 2 Pariaman through the Context, Input, Process, Product (CIPP) framework and a concurrent embedded mixed-methods design. The findings show that the program was generally implemented well across the four evaluation dimensions. Context achieved 75.13%, reflecting an adequate policy and program foundation; Input reached 74.39%, indicating that human resources, learning materials, and facilities largely supported implementation despite several resource constraints; and Process obtained 74.04%, showing that production-based learning, standard operating procedures, and student participation were functioning satisfactorily, although scheduling and teacher supervision required further strengthening. Product achieved the highest score at 78.79% and was categorized as very good, indicating favorable outcomes related to perceived student competencies, work readiness, entrepreneurial confidence, teamwork, and product standards. The qualitative evidence reinforced these results by demonstrating the integration of TeFa into school policy and curriculum, active student participation in production processes, and institutional commitment to connecting vocational learning with workplace demands. Collectively, these findings answer the study objective by showing that the Teaching Factory is functioning as an integrated school-based mechanism for linking vocational learning with industry-oriented practices while still exhibiting important implementation gaps.

The study contributes conceptually and methodologically by demonstrating how the CIPP model can be combined with concurrent embedded mixed methods to evaluate Teaching Factory implementation as an interconnected system of policy context, resource readiness, implementation processes, and program outcomes rather than as isolated indicators of effectiveness. Practically, the findings underscore the need for dedicated production facilities, additional industry-standard equipment, stronger teacher development through training and industrial internships, expanded partnerships with the business and industrial sectors, more systematic product-quality and customer-satisfaction evaluation, improved tracer-study mechanisms, and greater use of digital

marketing. These implications should, however, be interpreted within the study's limitations: the investigation was confined to one expertise program in one vocational school, the qualitative informants were predominantly internal stakeholders, the quantitative evidence relied substantially on student perceptions, and the observational and documentary evidence was limited. Future studies should therefore employ multi-school and comparative designs, include a larger and more diverse participant base, intensify the involvement of external industry partners and customers, and incorporate more extensive observational, documentary, and graduate-tracking evidence. Such research would strengthen the transferability of the CIPP-based evaluation framework and provide a more robust empirical foundation for developing sustainable, industry-responsive Teaching Factory governance in vocational education.

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