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Strategic Vocational Governance and Teaching Factory Development at SMKS YAPENTOP Toboali, Bangka

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ABSTRACT

This community service assistance program aimed to accelerate the institutional transformation of SMKS YAPENTOP Toboali, South Bangka Regency, following its official designation as a Vocational High School Center of Excellence (SMK-PK). SMKS YAPENTOP Toboali faced several critical management barriers, specifically a misalignment between its school vision and annual action roadmaps, lack of technical standard operating procedures in its teaching factory units, and insufficient data mapping for industrial teacher internship programs. To resolve these problems, Universitas Andalas executed a structured university-led mentoring program spanning six months. This article specifically discusses the outcomes of the third and fourth mentoring phases conducted between September and November 2021. The methods used included Participatory Action Research (PAR) combined with collaborative strategic workshops. The main interventions consisted of direct site infrastructure reviews, strategic roadmap synchronization, and mapping of local industrial partners (DUDIKA). The results showed that the program established a structured institutional roadmap, updated the school's vision to match industrial competencies, and provided management guidelines for the campus teaching factory. These outputs provide an institutional foundation for strengthening vocational school governance and continued curriculum-industry alignment.

Keywords: industrial partnership, teaching factory, vocational governance, SMK Center of Excellence, Participatory Action Research (PAR)

INTRODUCTION

Vocational education in Indonesia is undergoing structural transformation to strengthen the alignment between school-based education and the changing requirements of the labor market. As part of this transformation, the Ministry of Education, Culture, Research, and Technology introduced the Sekolah Menengah Kejuruan Pusat Keunggulan (SMK PK) program in 2021. The program aims to improve the quality and performance of selected vocational high schools through stronger partnerships and alignment with Dunia Usaha, Dunia Industri, dan Dunia Kerja (DUDIKA), referring to business, industry, and the world of work, while developing participating schools as reference institutions for other vocational schools (Biro Kerja Sama dan Hubungan Masyarakat, 2021). Industry involvement is particularly important because effective vocational education requires the alignment of curricula, competencies, workplace practices, and evaluation processes with actual industrial requirements (Yoto et al., 2024). Within the SMK PK framework,

designated higher education institutions serve as mentoring institutions to facilitate knowledge transfer, assist schools in planning and program implementation, oversee selected training and equipment-related activities, and strengthen sustainable link-and-match relationships between vocational schools and DUDIKA.

SMKS YAPENTOP Toboali, located in South Bangka Regency, Bangka Belitung Islands Province, is one of the vocational schools involved in this institutional development process. As a regional vocational school, it has the potential to contribute to the supply of skilled workers for local and regional industries. Initial field observations conducted during the mentoring activities, however, identified several institutional challenges. The school's long-term vision had not been adequately translated into measurable annual development roadmaps. The operational potential of its Teaching Factory (TeFa) had not been fully utilized, and structured information on industrial partners capable of supporting teacher and student internship programs remained limited. Similar challenges have been reported in Indonesian vocational education, particularly in relation to school-industry coordination, implementation of Teaching Factory programs, institutional management, and the readiness of industrial partners to sustain collaboration with vocational schools (Pradipta et al., 2021; Wahjusaputri et al., 2021; Wijanarka et al., 2023).

Accordingly, this article reports the results of the third and fourth university mentoring visits to SMKS YAPENTOP Toboali. The activities aimed to restructure and operationalize the school's strategic development roadmap, review the technical and managerial readiness of its Teaching Factory, and establish clearer pathways for industrial teacher internship programs through the identification and engagement of relevant DUDIKA partners. These activities were intended to address immediate operational problems and provide an institutional foundation for subsequent implementation of the SMK PK program at the school level.

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METHOD

Location and Timeline

The community service mentoring activities described in this article were carried out over two distinct field visit periods. The third visit took place from September 23 to 29 2021, and the fourth visit was conducted from October 31 to November 4, 2021. All activities were physically located at the campus of SMKS YAPENTOP Toboali, South Bangka Regency, Bangka Belitung Islands Province, as well as selected local industrial partner sites.

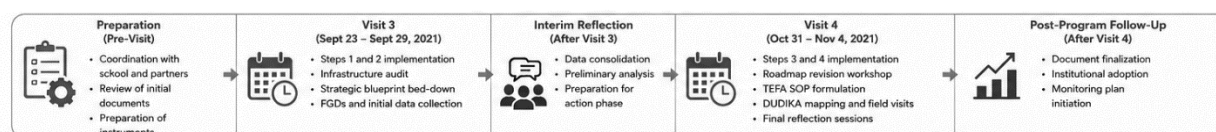


Figure 1. Timeline and Implementation Design

Approach and Target Participants

This program applied a Participatory Action Research (PAR) approach combined with institutional capacity building. The mentoring activities involved 19 participants, consisting of one foundation head, one School Principal, two members of the Center of Excellence (CoE) core team, ten teachers and other school stakeholders, and five representatives from industrial partners. These participants were directly involved in workshops, focus group discussions (FGDs), institutional evaluation, and the revision of school development documents.

Through the PAR approach, school leaders were not merely passive recipients of advice but were positioned as active change agents who participated in identifying institutional problems, reviewing existing practices, developing corrective actions, and evaluating the resulting improvements through a cyclical process of reflection and action (Kemmis et al., 2014).

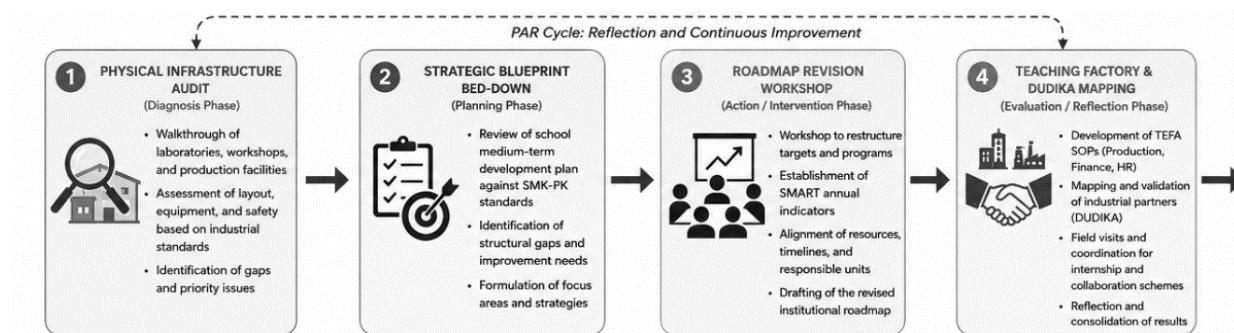


Figure 2. Flow of PAR-Based Mentoring Implementation

Data were collected using structured FGD guides, workshop worksheets, institutional document review sheets, observation checklists, and evaluation forms. The documents examined included the school strategic roadmap, Annual Work Plan, TEFA operational documents, and records of cooperation with industrial partners. Field observations and discussions were used to identify discrepancies between existing institutional practices and the requirements of the SMK Center of Excellence program.

The data were analyzed descriptively and thematically. Information obtained from FGDs, observations, and document reviews was organized according to the main mentoring areas, namely strategic planning, TEFA management, and industrial partnership development. The mentoring team compared conditions before and after the intervention to identify changes in institutional documents, management procedures, and planned follow-up actions. Agreements reached during workshops and FGDs were also recorded and used to verify whether the proposed institutional improvements had been accepted by the school management and relevant stakeholders.

Program output achievement was assessed using predefined readiness indicators for each mentoring component. Strategic planning output was considered achieved when the revised roadmap contained clearly defined development priorities, annual targets, responsible units, timelines, and measurable performance indicators. TEFA readiness was assessed based on the availability and content of revised operational and financial management procedures, including clearer responsibilities for production, sales, revenue recording, and financial accountability. Industrial partnership readiness was evaluated through the completion of an updated DUDIKA mapping database containing relevant partner profiles, fields of cooperation, and potential internship or curriculum collaboration opportunities. These indicators assessed immediate outputs and institutional readiness rather than long-term operational effectiveness. They were validated through document verification, direct review by the mentoring team, and confirmation during FGDs with school leaders and responsible personnel.

Operational Framework and Data Validation

Operationally, the PAR cycle was operationalized into four systematic steps to ensure a structured intervention process:

1. Physical Infrastructure Audit (Diagnosis Phase): Conducting direct walkthroughs of laboratories, workshops, and school production facilities to assess physical layout readiness based on industrial standards.
2. Strategic Blueprint Bed-Down (Planning Phase): Reviewing the school's existing medium-term development plan against national SMK-PK excellence standards to identify structural gaps.
3. Roadmap Revision Workshop (Action/Intervention Phase): Restructuring the school's target milestones into realistic, measurable, and time-bound annual indicators.
4. Teaching Factory and DUDIKA Mapping (Evaluation/Reflection Phase): Formulating management standard operating procedures (SOPs) for the internal school business unit and conducting field visits to local enterprise partners to coordinate formal internship structures.

To establish rigorous data validation within this qualitative PAR framework, this study employed methodological and source triangulation (Miles et al., 2014). Data gathered through physical observations and school administrative documents were cross-verified against the qualitative insights generated during the FGD sessions with school committees and industrial representatives, mitigating bias and ensuring analytical accuracy.

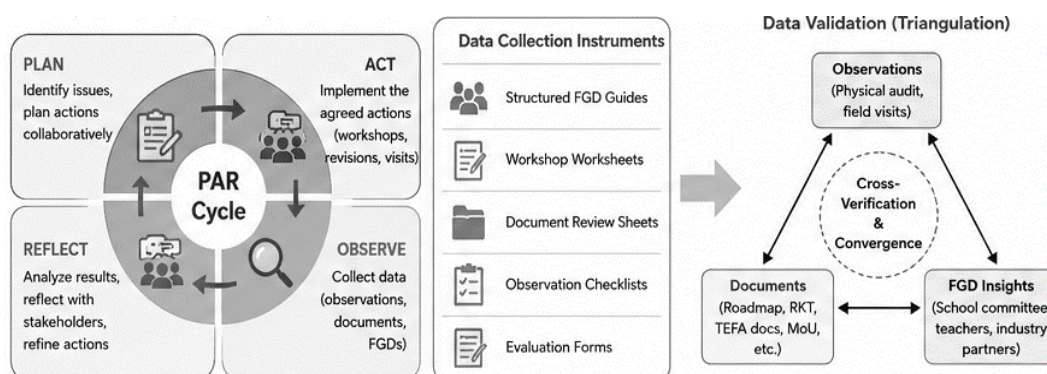


Figure 3. Program Design Framework

Evaluation Metrics and Indicators of Success

Program outcomes were evaluated using descriptive qualitative analysis mapped against predefined Output Readiness Metrics. Achievement of the planned outputs was assessed against the following parameters:

Table 1. Output Readiness Metrics for the Mentoring Program

Success Indicator	Qualitative Evaluation Metric	Target / Minimum Threshold
Institutional Roadmap	Alignment of the updated school vision with annual SMK-PK indicators using the SMART framework (<i>Specific, Measurable, Achievable, Relevant, Time-bound</i>).	1 newly structured roadmap document formally approved by the Principal and School Committee.
Teaching Factory (TEFA)	Operational feasibility of technical production workflows, financial	Minimum of 3 core TEFA SOPs (Production, Finance,

Management Guidelines	autonomy regulations, and curriculum integration.	and HR) completed and ready for pilot implementation.
Teacher Industrial Training Blueprint	Alignment of local industrial competency needs with structured teacher placement slots.	Mapping of at least 5 strategic local industrial partners (DUDIKA) committed to formal training placements.

A final evaluation was conducted at the end of the fourth visit through a collaborative reflective review with stakeholders to assess the documented outputs, stakeholder acceptance, and institutional readiness for subsequent implementation (Stringer & Aragon, 2020).

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 Teaching Factory (TEFA) Management Guidelines	Operational feasibility of technical production workflows, financial autonomy regulations, and curriculum integration.	Minimum of 3 core TEFA SOPs (Production, Finance, and HR) completed and ready for pilot implementation.
 Teacher Industrial Training Blueprint	Alignment of local industrial competency needs with structured teacher placement slots.	Mapping of at least 5 strategic local industrial partners (DUDIKA) committed to formal training placements.

 **F** Final Evaluation: Conducted at the end of the fourth visit through a collaborative reflective review with stakeholders to assess documented outputs, stakeholder acceptance, and institutional readiness for subsequent implementation.

Figure 4. Output Readiness Metrics (Indicators of Success)

RESULTS AND DISCUSSION

The structural transformation of SMKS YAPENTOP Toboali into a national Center of Excellence (SMK-PK) requires systematic realignments across physical, strategic, and operational dimensions. To evaluate the immediate outcomes of the university-led mentoring intervention, baseline institutional conditions were compared with the documented outputs and readiness conditions observed at the end of the mentoring process.

Baseline and Post-Intervention Institutional Readiness Evaluation

Table 2 summarizes the documented changes from the pre-intervention condition to the post-intervention institutional readiness condition.

Table 2. Baseline and Post-Intervention Institutional Readiness Evaluation

Key Performance Area	Baseline Condition	Post-Intervention Outcome	Measurement and Supporting Evidence
Laboratory Infrastructure & K3	Equipment layout was not systematically organized according to 5S principles, and	Workspace zoning, equipment arrangement, and visible safety pathways were	Verified through comparative field observations, physical audit records, and photographic

	several areas required improvement in workspace organization and emergency access.	reorganized based on 5S principles and mentoring recommendations.	documentation before and after the intervention.
Strategic Roadmap Alignment	The existing development plan had not been systematically translated into annual targets aligned with SMK-PK priorities.	A revised five-year institutional roadmap was developed with eight annual SMART-based milestones and discussed with school management.	Verified by comparison between the initial planning document and the revised roadmap produced during the mentoring workshop, supported by workshop and FGD records.
Teaching Factory (TEFA) SOPs	TEFA operations had no separate operational framework for production, financial management, and human-resource responsibilities.	Three core operational guidelines covering production, financial management, and human resources were developed for subsequent institutional implementation.	Verified through document review of the three TEFA operational guidelines and records of their review with school management. This represents readiness/output achievement, not measured TEFA effectiveness.
DUDIKA Partnership Mapping	Industrial partnerships were not systematically mapped according to teacher-training needs, and no structured list of potential teacher industrial placements was available.	Five local industrial partners were identified and mapped according to relevant vocational competencies and potential teacher-training opportunities.	Verified through the DUDIKA mapping document, field-visit records, and discussions with school and industrial representatives.

Laboratory Infrastructure Review and Safety Layout Adjustment

The initial phase focused on the technical readiness of practical learning facilities. Under the Ministry of Education, Culture, Research, and Technology (MoECRT) SMK-PK framework, a school's workshop is expected to approximate an industrial production environment that supports workplace-oriented learning. The architectural audit identified spatial constraints and layout bottlenecks that could hinder orderly material movement within the workshop. Based on the audit and mentoring recommendations, equipment was repositioned into more logical and sequential production pathways.

The reorganization improved workspace arrangement, equipment placement, and the visibility of safety pathways. These observable changes indicate improved physical readiness of the workshop environment rather than measured improvements in material-handling efficiency or Occupational Safety and Health (K3) performance. Incorporating spatial redesign and business management practices within educational production

settings can support the development of more organized operating environments (Albar & Amsal, 2024b). The 5S methodology (Sort, Set in order, Shine, Standardize, Sustain) also provides a structured basis for organizing workplace environments (Wheelen et al., 2018).

Strategic Alignment and Document Roadmap Restructuring

FGD with the School Principal and the Center of Excellence core team identified a governance gap between the school's daily activities and its long-term strategic charter. This misalignment created a risk that spending and machinery acquisition would not consistently correspond with regional labor-market needs. The roadmap synchronization workshop restructured these goals using the SMART (Specific, Measurable, Achievable, Relevant, Time-bound) framework. The school's vision was revised to emphasize industrial competencies relevant to the Bangka Belitung region.

To address this governance gap, structured situational assessment can provide a basis for reviewing organizational capabilities and refining longer-term priorities (Larasati et al., 2025). This target-oriented coordination is consistent with community-led incubation models that seek to strengthen local institutional management (Albar & Amsal, 2024a). From a resource-based perspective, aligning physical assets with organizational priorities can help reduce misaligned spending and support institutional accountability (Teece, 2014).

Teaching Factory (TeFa) Technical Management and SOP Formulation

During the fourth mentoring visit, interventions focused on the financial and operational structures of the school's internal business unit, TEFA. To satisfy the national parameters, a TEFA must function as a self-sustaining enterprise embedded within the academic environment. The structural evaluation indicated that SMKS YAPENTOP's TEFA faced financial risks because its business revenues were co-mingled with the school's general tuition fund. This centralized financial arrangement created administrative constraints in raw-material procurement.

The mentoring team developed three distinct Standard Operating Procedures (SOPs) covering production quality control, independent cash flow management, and human resource scheduling. Related community-based institutional programs have used internal-control and accounting procedures to strengthen financial administration and transparency (Oktavia et al., 2023). In the present program, the development of these SOPs represents a readiness output rather than evidence that TEFA operational efficiency had already improved.

Separate accounting systems can provide a clearer basis for profit-and-loss evaluation and asset administration. Standardized practices such as fixed-asset depreciation have been applied in community enterprise financial management (Komalasari et al., 2023). For SMKS YAPENTOP Toboali, the proposed financial separation was intended to provide a clearer administrative basis for TEFA procurement and financial accountability. The mentoring period did not measure subsequent changes in procurement time, profitability, production performance, or other indicators of TEFA effectiveness.

Industrial Partnership (DUDIKA) and Teacher Internship Mapping

To create a functional "link and match" relationship rather than a superficial agreement on paper, the mentoring team accompanied school leaders on field visits to prospective enterprise partners across South Bangka Regency. These field exercises were specifically designed to map out regional corporate networks capable of hosting vocational educators for intensive industrial attachments. Industrial training for teachers is critical as it allows educators to update their technical knowledge, experience modern workplace

cultures firsthand, and directly integrate these competencies into the daily school curriculum.

This partnership-oriented approach is consistent with structural transformation initiatives that encourage local institutions to strengthen internal operational systems to meet broader standards (Albar & Amsal, 2024b). The field visits identified and mapped five local industrial partners (DUDIKA) according to their relevance to the school's vocational competencies and potential teacher-training opportunities. The core intervention areas managed during these mentoring phases are summarized in Table 3.

Table 3. Structure of University Mentoring Interventions at SMKS YAPENTOP Toboali

No	Mentoring Phase	Primary Deliverable Outcomes
1	Institutional Roadmap	Drafted the updated institutional roadmap and aligned the long-term school vision.
2	Teaching factory	Formulated teaching factory management SOPs and completed industrial internship mapping.

As shown in Table 3, the consecutive mentoring visits addressed the identified administrative and operational readiness gaps and strengthened the institutional readiness of SMKS YAPENTOP Toboali for subsequent implementation of its national vocational mandate.



Figure 5. (a) FGDs and Workshop (b) Institutional mentoring

The field execution of the university-led mentoring program is visually documented in Figure 5, illustrating the sequence from strategic planning activities to physical field verification. The focus group discussion sessions (shown on the left) served as a platform for collaborative decision-making, where school administrators and the university mentor reviewed and restructured the institutional roadmap in relation to national excellence criteria.

This strategic planning was paired with physical field inspections of the on-site construction and layout development of the school's new teaching factory facility (shown on the right). The documentation shows that the mentoring process included physical inspection in addition to administrative planning. These inspections were used to assess facility layout, workflow organization, and physical readiness for subsequent Teaching Factory implementation.

CONCLUSION

The university-led mentoring activities conducted during the third and fourth field visits produced the main planned capacity-building outputs at SMKS YAPENTOP Toboali. The strategic roadmap workshop aligned the school's long-term vision with measurable annual development targets under the national Center of Excellence, or SMK-PK, framework. The Teaching Factory review produced operational guidelines for subsequent implementation, while the industrial-partner mapping identified potential pathways for teacher internship and continued school-industry coordination.

The main practical contribution of this program lies in providing an integrated institutional development model that connects strategic planning, TEFA management, and school-industry collaboration within a single mentoring framework. Rather than addressing these areas separately, the program demonstrates how university-led assistance can support vocational schools in translating national policy objectives into operational practices at the school level. This approach can serve as a practical reference for other vocational schools seeking to strengthen institutional capacity while adapting national vocational education policies to local economic and industrial conditions.

Based on these findings, several policy implications should be considered to support institutional sustainability. First, the management of SMKS YAPENTOP Toboali should formally incorporate the revised strategic roadmap into the school's Annual Work Plan, or Rencana Kerja Tahunan. Integrating the roadmap into official planning documents can help ensure that resource allocation, program implementation, and institutional evaluation remain connected to clear and measurable performance targets.

At the institutional level, greater financial autonomy should also be considered for TEFA operations. School management should develop formal regulations that provide separate financial accounting mechanisms for TEFA activities. Greater operational flexibility may support the management of production and service activities while maintaining institutional accountability. Clear internal controls and standardized accounting procedures are therefore needed to support transparency in sales transactions, revenue recording, expenditure management, and cash administration.

For regional policymakers, the mentoring experience indicates that vocational education transformation requires coordinated improvements across managerial, instructional, and industrial partnership dimensions. Local education authorities should therefore institutionalize regional cooperation mechanisms that encourage DUDIKA partners to provide recurring and structured internship opportunities. Such arrangements can strengthen long-term collaboration between vocational schools and industry while ensuring that students receive sustained exposure to workplace practices and current industrial requirements.

Several limitations should be considered when interpreting the outcomes of this program. The mentoring activities were conducted within a single vocational school and were concentrated within two field-visit periods. The results therefore reflect the institutional conditions, managerial capacity, and industrial environment of SMKS YAPENTOP Toboali and may not be directly transferable to vocational schools operating in

different regional or organizational contexts. In addition, the program primarily evaluated immediate institutional outputs, such as revised planning documents, TEFA management arrangements, and industrial partnership mapping, rather than long-term outcomes related to student employability, TEFA financial performance, or the sustainability of industry collaboration.

Future implementation should therefore include longer-term monitoring and periodic evaluation of the revised strategic roadmap, TEFA operations, and DUDIKA partnerships. Subsequent mentoring programs may also involve multiple vocational schools to examine whether the model can be adapted across different institutional and regional contexts. Future implementation should further develop measurable indicators covering TEFA financial performance, internship continuity, curriculum alignment with industry requirements, graduate employment outcomes, and the sustainability of school-industry partnerships. These measures would provide a stronger basis for evaluating the long-term effectiveness and scalability of university-led vocational education mentoring programs.

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