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Strategic Management of Teacher Professionalism Development through the Teaching Factory Model

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Abstract:

This study examines strategic management in developing teacher professionalism through the Teaching Factory (TeFa) approach. The Research aims to analyse strategic management processes, identify supporting and inhibiting factors, and examine the contribution of TeFa-based professional development to learning quality and student work readiness. A qualitative approach was employed using in-depth interviews, non-participant observations, and document analysis. Data were analysed through data reduction, data display, and conclusion drawing. The findings indicate that TeFa-based teacher professional development is managed through systematic stages of strategy formulation aligned with institutional vision, strategy implementation through delegated managerial roles and annual planning, and strategy evaluation of implemented programs. Supporting factors include institutional readiness and collaboration with industry partners, while inhibiting factors involve limited infrastructure, budget constraints, and unequal industry absorption capacity. The study also reveals that TeFa-based professional development contributes to improved instructional quality and enhanced student readiness for the world of work. These findings highlight the importance of strategic management in optimising the implementation of the Teaching Factory as a sustainable model for teacher professionalism development.

Keywords: *Strategic Management, Teacher Professional Development, Teaching Factory*

Abstrak:

Penelitian ini mengkaji manajemen strategis dalam pengembangan profesionalisme guru melalui pendekatan Teaching Factory (TeFa). Penelitian ini bertujuan untuk menganalisis proses manajemen strategis, mengidentifikasi faktor pendukung dan penghambat, serta mengkaji kontribusi pengembangan profesional berbasis TeFa terhadap kualitas pembelajaran dan kesiapan kerja peserta didik. Pendekatan kualitatif digunakan dengan teknik wawancara mendalam, observasi nonpartisipan, dan analisis dokumen. Data dianalisis melalui tahapan reduksi data, penyajian data, dan penarikan kesimpulan. Temuan penelitian menunjukkan bahwa pengembangan profesional guru berbasis TeFa dikelola melalui tahapan sistematis yang meliputi perumusan strategi yang selaras dengan visi institusi, implementasi strategi melalui pendelegasian peran manajerial dan perencanaan tahunan, serta evaluasi strategi terhadap program yang telah dilaksanakan. Faktor pendukung meliputi kesiapan institusi dan kerja sama dengan mitra industri, sedangkan faktor penghambat mencakup keterbatasan infrastruktur, kendala anggaran, dan ketimpangan daya serap industri. Penelitian ini juga mengungkapkan bahwa pengembangan profesional berbasis TeFa memberikan kontribusi positif dalam meningkatkan kualitas pembelajaran dan memperkuat

kesiapan peserta didik untuk memasuki dunia kerja. Temuan ini menegaskan pentingnya manajemen strategis dalam mengoptimalkan implementasi Teaching Factory sebagai model berkelanjutan dalam pengembangan profesionalisme guru.
Kata Kunci: *Manajemen Strategi, Pengembangan Profesionalisme Guru, Teaching Factory*

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INTRODUCTION

Vocational education in Indonesia is normatively positioned as a strategic instrument for producing a skilled workforce capable of responding to the growing complexity of technology-based industries (Ahmad et al., 2023; Simanjuntak & Widyadhana, 2025). Theoretically, vocational education is designed to bridge the gap between education and employment through authentic and contextual learning. However, in practice, a persistent mismatch persists between graduates' competencies and industry demands. This condition reflects a discrepancy between the ideal concept of vocational education and its practical implementation in schools, particularly in integrating industry needs into the learning process.

In response to these challenges, the Teaching Factory (TeFa) learning model has been developed to integrate school-based learning with real industrial production processes. Conceptually, TeFa enables students to gain authentic learning experiences aligned with workplace practices through simulations of industrial environments, production standards, and professional work culture. At the policy level, TeFa implementation aligns with the mandate of Law No. 20 of 2003 on the National Education System. Nevertheless, empirical evidence indicates that TeFa has not yet fully achieved optimal alignment between vocational graduates' competencies and industry requirements.

Several empirical studies indicate that although TeFa has strong potential to align vocational graduates' competencies with labour market demands (Kebede et al., 2024; Tuala et al., 2024), its implementation remains constrained by various factors. Key challenges include institutional readiness, limited resources, and weak coordination between schools and industry partners (Maksum et al., 2025; Mokher & Jacobson, 2021). These findings suggest that the effectiveness of TeFa depends not only on curriculum design and policy frameworks but also on schools' managerial capacity to manage internal resources effectively.

One of the most critical factors influencing the implementation of TeFa is the quality and professionalism of vocational teachers. Previous studies indicate that many vocational teachers lack sufficient industrial work experience, which results in difficulties translating industry standards, work culture, and production-oriented learning into effective classroom and workshop practices (Antera & Nilsson, 2025; He & Li, 2025; Zhu & Liu, 2023). Within the TeFa framework, teachers are required to act not only as instructors but also as production facilitators and industry liaisons. Therefore, teacher professional development becomes a key element in bridging the gap between TeFa's conceptual design and its practical implementation.

Existing studies emphasise that TeFa serves as a mechanism for transferring industrial knowledge, technology, and work culture into vocational schools (Darimus & Hanif, 2023; Fathurrahman et al., 2024; Purwanto et al., 2024). Within the framework of the Vocational High School Centre of Excellence Program (PK-SMK), TeFa is positioned as a strategic model for strengthening linkages with the business and industry sectors (DUDI) while developing students' technical and non-technical competencies. However, most studies primarily focus on student outcomes or policy perspectives. At the same time, limited attention has been given to the managerial aspects of teacher professional development in TeFa implementation, particularly within PK-SMK institutions.

Drawing on the identified theoretical and empirical gaps, this study seeks to develop an in-depth understanding of how Teaching Factory (TeFa)-based teacher professional development is managed within the context of Vocational High School Centres of Excellence (PK-SMK). The study focuses on school managerial practices in designing, implementing, and evaluating teacher professional development, as well as on institutional dynamics that shape the sustainability of TeFa implementation. Furthermore, it explores contextual factors that function as both enablers and barriers, and examines the implications of TeFa-based teacher professional development for learning quality and students' work-readiness. This study is grounded in the argument that the effectiveness of the Teaching Factory model is not solely determined by curriculum design or industry partnerships but is critically dependent on schools' capacity to manage teacher professionalism as a central agent in translating industrial practices into meaningful and sustainable learning experiences.

RESEARCH METHODS

The unit of analysis in this study is the management of teacher professionalism development through the Teaching Factory (TeFa) model within the institutional context of a Vocational High School Centre of Excellence (SMK PK). The Research was conducted at SMK Muhammadiyah 2 Pekanbaru, a vocational high school that has formally implemented the Teaching Factory model and has been officially designated as an SMK PK. The case examined includes school managerial practices in planning, implementing, and evaluating teacher professional development strategies through TeFa. The unit of analysis also encompasses the school institution, TeFa-based learning programs, teaching and learning activities in classrooms and workshops, the involvement of school and industry actors, and institutional artefacts such as curriculum documents, teacher professional development reports, and evaluation documents related to TeFa implementation. The selection of SMK Muhammadiyah 2 Pekanbaru was purposive, as its status as an SMK PK positions it as a reference institution expected to demonstrate best practices in industry-oriented vocational education management.

This study adopts a qualitative Research approach using a case study design. A qualitative approach is appropriate for understanding social phenomena in their natural contexts, with an emphasis on meaning, processes,

and interactions that cannot be adequately captured through quantitative measurement (Fahmi, 2024; Okoko et al., 2023). The case study design enables an in-depth exploration of a bounded system within a specific institutional setting and time frame, allowing for a holistic, contextually grounded understanding of teacher professional development management through the Teaching Factory model. This design aligns with the study's focus on institutional dynamics and managerial practices in vocational education.

The sources of information in this study consist of key informants and institutional documents. Informants were selected purposively based on their roles, responsibilities, and involvement in the Teaching Factory implementation and teacher professional development. They include the school principal, vice principals, vocational teachers, students participating in TeFa activities, and representatives from business and industry (DUDI). In addition, textual data were obtained from institutional documents, including curriculum guidelines, teacher professional development reports, Teaching Factory implementation guidelines, and evaluation documents. The use of diverse information sources was intended to capture multiple perspectives and enhance the depth and credibility of the analysis.

Data were collected using multiple qualitative techniques to ensure triangulation and strengthen the credibility of the findings (Donkoh & Mensah, 2023; Meydan & Akkaş, 2024). First, a desk review was conducted to examine relevant institutional documents and policy-related materials to understand the framework and implementation of TeFa-based teacher professional development. Second, semi-structured in-depth interviews were conducted with key informants using interview guidelines to explore experiences, perceptions, and managerial strategies related to TeFa implementation. Third, direct observations were conducted to examine TeFa-based learning activities and teaching practices as they occurred naturally in classrooms and workshops. Data collection continued until data saturation was reached, indicated by the absence of new themes or insights emerging from subsequent interviews and observations.

Data analysis was conducted concurrently with data collection. All data obtained from interviews, observations, and documents were analysed using the interactive data analysis model proposed by Miles and Huberman. The analysis involved three main stages: data reduction, data display, and conclusion drawing and verification. These stages were applied systematically to identify patterns, categories, and themes relevant to the Research objectives. The analytical approach employed was interpretive analysis, focusing on the meanings, relationships, and institutional dynamics that shape the management of teacher professionalism development through the Teaching Factory model.

RESULTS AND DISCUSSION

Results

Strategic Management of Teacher Professional Development Based on TeFa

Teacher professional development based on Teaching Factory (TeFa) in this study is operationally defined as a set of planned and ongoing efforts undertaken by the school leadership to enhance teachers' pedagogical, technical,

and managerial competencies through training, internships, certification, and direct involvement in industry-based learning activities that support the implementation of TeFa.

Field data from interviews with school leaders indicate that teacher professional development aligns with the school's vision and mission, which emphasize graduate competitiveness, entrepreneurial character, and readiness for the world of work. Teachers are provided with opportunities to participate in competency-based training and internships in schools and workplaces relevant to their respective departments. However, the implementation of these efforts varies across departments, as not all have adequate facilities, infrastructure, and budgetary support to implement TeFa-based professional development fully.

Additional interview findings reveal that the availability of certified teachers plays a crucial role in determining the extent of TeFa implementation. Departments with at least two teachers holding relevant competency certificates can apply TeFa more consistently, whereas departments lacking certified teachers tend to implement it in a limited or simplified manner. Constraints related to infrastructure and incomplete cooperation with industry partners further restrict the full implementation of TeFa across all departments.

Observational data further illustrate the variation in the implementation of TeFa-based teacher professional development across departments. In the Visual Communication Design department, TeFa is implemented more comprehensively, supported by adequate facilities, such as a functional school printing laboratory, and by teachers holding relevant competency certificates. Learning activities in this department closely resemble industrial work processes, where teachers guide students through production-based tasks aligned with industry standards. In contrast, observations in other departments show that TeFa-related activities are conducted in a more fragmented manner due to limited facilities and supporting resources. These observations indicate that the actual practice of TeFa-based professional development differs across departments depending on the availability of supporting conditions in the field. These empirical findings are summarised in Table 1 to provide an integrated overview of TeFa-based teacher professional development across departments.

Table 1. Summary of Empirical Findings on TeFa-Based Teacher Professional Development

Findings Aspect	Data Indicators	Description of Empirical Findings
Strategy Formulation	School vision and mission	The school vision emphasizes producing graduates who are excellent, possess Islamic character, are competitive, entrepreneurial, and capable of competing globally.
	Teacher professional development programs	Teachers are provided with opportunities to participate in competency-based training and internships in other schools and relevant workplaces according to their departments.
	Teacher certification	Each department has at least two teachers holding competency certificates; however, certification is not evenly distributed across all departments.
	TeFa implementation	TeFa has not been fully implemented in all departments due to limitations in facilities, infrastructure, and budget.

	Industry collaboration	Cooperation with business and industry partners is not yet optimal, resulting in limited absorption of graduates into the workforce.
	Leading department	The Visual Communication Design (VCD) department has five certified teachers and adequate facilities, enabling full implementation of TeFa.
	Graduate absorption in VCD	Graduates from the VCD department are optimally absorbed into the labor market, with additional workforce demand from industry partners.
	School business laboratory	The school's business laboratory in the form of a printing unit supports TeFa implementation through direct student practice under teacher supervision.
Strategy Implementation	Leadership involvement	The principal and school leaders collaborate with various stakeholders to support teacher training, internships, and further education.
	Program implementation rate	Approximately 75% of the annual teacher professional development programs are successfully implemented.
	Foundation support	The Muhammadiyah Primary and Secondary Education Council facilitates partnerships with companies, banks, government institutions, and other schools.
	Organizational structure	The school has a clear organizational structure aligned with functional responsibilities and department leadership, including annual work program requirements.
	Teacher internship programs	At least two teachers per year are assigned to internships in companies, workplaces, or schools relevant to their areas of expertise.
	Supporting activities	Teachers are involved as competency assessors and examiners and are supported by budget allocation and facilities for TeFa implementation.
Strategy Evaluation	Post-internship implementation	Teachers who have completed internships are given opportunities to apply TeFa within their respective departments.
	Scope of implementation	All departments have attempted to implement TeFa; however, implementation remains suboptimal in most departments.
	Developed department	The VCD department is the only department that has optimally developed TeFa-based teacher professionalism.
	Government support	The VCD department has received facilities and laboratory support from the local Education Office.
	External evaluation	No external evaluation of TeFa implementation has been conducted by the Education Office.
Supporting Factors (Internal)	School status	SMK Muhammadiyah 2 Pekanbaru holds the status of a Center of Excellence (SMK PK).
	Teacher competence	Several teachers already possess competency certificates aligned with their areas of expertise.

	Supporting facilities	The school business laboratory (printing unit) supports students' industry-based practical learning.
Supporting Factors (External)	Industry collaboration	Partnerships with business, industry, and government institutions support teacher and student internships.
	Government assistance	Government support in facilities and infrastructure strengthens TeFa implementation, particularly in the VCD department.
Inhibiting Factors (Internal)	Infrastructure limitations	Facilities and infrastructure are limited in most departments.
	Budget constraints	School budget limitations restrict facility procurement and teacher internship programs.
	Teacher certification gaps	Not all productive-subject teachers hold industry competency certificates.
Inhibiting Factors (External)	Industry absorption capacity	Not all business and industry partners are able to absorb graduates from all departments.
	Institutional collaboration	Cooperation with higher education institutions and other partners has not been fully optimized.
Impact on Learning and Work Readiness	Learning quality	Departments with certified teachers and adequate facilities demonstrate higher learning quality.
	Student work readiness	Student work readiness is high in the VCD department but remains uneven across other departments.
	Graduate employment	The highest graduate employment rates are found in the VCD department, while other departments show relatively lower absorption.

Field data indicate that implementing TeFa-based teacher professional development has a direct impact on learning quality and student work-readiness across departments. Departments supported by certified teachers and adequate facilities demonstrate higher learning quality, as reflected in the use of production-based learning activities that follow industry work standards and workflows. Observations indicate that students in these departments are more actively engaged in hands-on tasks under teacher supervision, thereby strengthening their technical competencies and practical skills. Furthermore, student readiness for the world of work is more evident in departments with comprehensive TeFa implementation, particularly in the Visual Communication Design department, where graduates are more readily absorbed into the labour market. In contrast, departments with limited facilities and fewer certified teachers exhibit less intensive, industry-oriented learning practices, resulting in uneven levels of student work-readiness across departments.

The data show a consistent pattern in which the implementation of TeFa-based teacher professional development is closely associated with the presence of certified teachers, adequate infrastructure, and access to industry-oriented learning facilities. Departments that meet these conditions demonstrate more

structured and continuous TeFa practices, while departments with limited resources and fewer certified teachers tend to apply TeFa in a more limited and partial manner. This pattern reflects how variations in institutional readiness shape the form and scope of TeFa implementation across departments.

Discussion

The findings of this study indicate that the development of Teaching Factory (TeFa)-based teacher professionalism at SMK Muhammadiyah 2 Pekanbaru is primarily determined by institutional readiness, particularly the availability of certified teachers, industry-oriented learning infrastructure, and supporting production facilities. This finding aligns with the concept of strategic management, which views strategy as a systematic process of formulating, implementing, and evaluating decisions to achieve organisational goals sustainably (Alharbi, 2024; Twabu, 2025). From a strategic management perspective, implementation effectiveness depends heavily on alignment among institutional vision, available resources, and operational practices at the work-unit level (Gede & Huluka, 2023). Therefore, in the context of vocational education, institutional readiness is a key prerequisite for the consistent and meaningful implementation of industry-based learning models like TeFa.

The variation in TeFa implementation across departments at this school indicates challenges in translating strategic planning into uniform practices. Although the school's vision has been clearly formulated to support industry-based learning, differences in teacher certification, facility availability, and budget allocation have led to uneven implementation of TeFa (Pamungkas et al., 2024). These findings support the view that successful strategy implementation is primarily determined by organisational capacity and leadership effectiveness in coordinating and mobilising internal and external resources (Gisevius et al., 2025; Kim & Choi, 2023). Therefore, strategic management of TeFa requires cross-unit coordination and ongoing stakeholder engagement to ensure that the program remains a policy formality.

Comprehensive implementation of TeFa in the Visual Communication Design department demonstrates the importance of strategic alignment between human resources and learning infrastructure. The presence of certified teachers with industry competencies and adequate production facilities allows the learning process to mimic real-world industrial practices (Fan et al., 2024; Irungu, 2025). These findings are consistent with the literature, which asserts that Teaching Factories function optimally when supported by authentic production environments and structured industry partnerships (Mourtzis et al., 2023; Terkaj et al., 2024). Within the national policy framework, TeFa is positioned as a strategic instrument to strengthen the linkages between vocational schools and industry and labour market needs, and this study confirms that this goal can only be achieved with tangible and sustainable resource support.

In terms of learning outcomes, TeFa-based teacher professional development significantly improves the quality of learning and student job-

readiness, particularly in departments with strong institutional support. Professional teachers play a central role in creating effective and workplace-relevant learning environments (Hutson & Ceballos, 2023; Laguttseva-Nogina et al., 2024). The quality of learning is strongly influenced by strategically managed pedagogical, professional, and technical competencies of teachers (Amaliah et al., 2024). Teachers with industry experience and adequate technical competency are better able to facilitate authentic, production-based learning, thereby strengthening students' readiness to face the demands of the workforce.

The Research also revealed several limitations that hamper the widespread implementation of TeFa-based teacher professional development. Infrastructure limitations, budget constraints, and suboptimal collaboration with industry partners limit teacher internship opportunities and authentic learning experiences (Hiim, 2023; Liu et al., 2025). These findings align with previous studies emphasising the importance of systematic evaluation and continuous improvement in vocational education (Li & Pilz, 2023; McGrath & Yamada, 2023). The absence of regular external evaluation can undermine strategic refinement and the long-term sustainability of TeFa implementation.

From a broader theoretical perspective, this study's findings can be explained through a resource-based view (RBV) and dynamic capabilities. Differences in TeFa implementation success across departments reflect heterogeneity in internal resources and capabilities, with departments having certified teachers and complete production facilities.

CONCLUSION

This study demonstrates that the success of Teaching Factory (TeFa) based teacher professional development at SMK Muhammadiyah 2 Pekanbaru is strongly determined by institutional readiness, particularly the availability of certified teachers, adequate learning infrastructure, and effective industry collaboration. The central lesson derived from this Research is that TeFa should not be understood merely as an instructional approach, but rather as a strategic management process that requires alignment among resources, school leadership, and organisational capacity to ensure consistent and sustainable implementation. The primary scholarly contribution of this study lies in its integration of strategic management theory, the resource-based view, and organisational change perspectives to explain uneven TeFa implementation at the departmental level. Empirically, the findings enrich the literature on vocational education management by confirming that TeFa-based professional development strengthens teacher professionalism, enhances learning quality, and improves students' work readiness when supported by coherent planning and industry-oriented learning environments.

Despite its significant contributions, this study has several limitations, including its focus on a single vocational school as a case study, limited institutional variation, and the absence of explicit consideration of teacher characteristics such as gender, age, and professional background. In addition, the

qualitative approach employed in this Research was not complemented by systematic external evaluation or quantitative data that would allow for broader generalisation of the findings. Accordingly, future studies are encouraged to adopt comparative and longitudinal Research designs across diverse vocational school contexts and to incorporate survey-based and mixed-methods approaches to obtain a more comprehensive understanding. Such efforts are expected to provide stronger empirical foundations for evidence-based policies on TeFa-based teacher professional development that are more targeted, sustainable, and responsive to the evolving demands of vocational education systems.

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