JURNAL PENDIDIKAN VOKASI DAN SENI

Jurnal Pendidikan Vokasi dan Seni
Universitas Muhammadiyah Muara Bungo
DOI: https://doi.org/10.52060/jpvs.v4i2.3984
Vol 4, No 2, Maret 2026, hlm 21-26
E- ISSN : 2962-150X
P-ISSN :

A Review of Teaching Factory Implementation Strategies within Culinary Vocational Education

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ABSTRAK

Teaching Factory (TeFa) merupakan model pembelajaran berbasis industri yang dirancang untuk menyelaraskan dunia pendidikan vokasi dengan dinamika kebutuhan lapangan kerja. Pada pendidikan vokasional seni kuliner, TeFa sangat krusial untuk mengasah kompetensi mahasiswa melalui pengalaman belajar autentik yang mereplikasi lingkungan kerja profesional. Penelitian ini mengkaji konsep, pola implementasi, manfaat, serta berbagai kendala dalam penerapan TeFa di bidang seni kuliner melalui pendekatan studi pustaka. Menggunakan metode kualitatif deskriptif, data dikumpulkan dari berbagai buku, artikel jurnal, dan dokumen kebijakan. Temuan penelitian menunjukkan bahwa TeFa efektif meningkatkan kesiapan kerja dan keterampilan teknis maupun non-teknis mahasiswa. Meski demikian, keterbatasan sarana prasarana, kurikulum yang belum sinkron, serta rendahnya keterlibatan industri masih menjadi hambatan utama dalam pelaksanaannya. Hasil kajian ini diharapkan dapat menjadi rujukan konseptual dalam optimalisasi pembelajaran berbasis produksi di jenjang vokasi kuliner.

Kata kunci: *Teaching Factory, pendidikan vokasional, seni kuliner, pembelajaran berbasis industri, Kajian Literatur*

ABSTRACT

The Teaching Factory (TeFa) is an industry-integrated pedagogical framework aimed at bridging the gap between vocational education and workforce requirements. In culinary arts vocational programs, TeFa implementation is vital for enhancing student competencies through contextualized learning within simulated professional environments. This study investigates the concepts, implementation models, benefits, and strategic challenges of TeFa in the culinary sector via a comprehensive literature review. Employing a qualitative descriptive method, the research analyzes academic literature, journal articles, and relevant policy documents. The results indicate that TeFa significantly improves work-readiness and strengthens both technical and soft skills. However, its success is often constrained by inadequate facilities, curriculum gaps, and limited industry synergy. This study serves as a conceptual reference for the advancement of production-based learning in culinary vocational education.

Keywords : *Teaching Factory, vocational education, culinary arts, industry-based learning, literature review*

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INTRODUCTION

Vocational education plays a strategic role in preparing competent and work-ready human resources through the integration of knowledge, practical skills, and professional attitudes. Unlike academic education, which emphasizes theoretical aspects, vocational education requires contextual learning that is relevant to industrial needs. Therefore, learning innovations capable of providing real-world work experiences have become a primary necessity in the development of vocational education.

Practical learning that remains simulative often fails to authentically depict industrial situations, leaving students not fully prepared to face professional work environments. This condition necessitates a learning model that can integrate the educational process with actual production activities so that students gain more applicable learning experiences.

Teaching Factory is an industry-based learning approach that combines educational activities with production systems or services that resemble actual working conditions. Through Teaching Factory, students not only learn technical cooking skills but are also involved in production management, consumer service, quality control, and the application of professional work standards. Various studies indicate that Teaching Factory is capable of enhancing practical competence, soft skills, and the work readiness of vocational students.

Based on this background, this study aims to examine the concepts, implementation models, benefits, and challenges of Teaching Factory in vocational culinary education through a literature review approach. This study is expected to serve as an academic reference in the development of industry-based learning within culinary arts vocational education programs.

METHODS

This study employed a qualitative approach with a descriptive method through a literature review. The research was conducted at the Culinary Arts Vocational Education Study Program, Universitas Muhammadiyah Muara Bungo, focusing on conceptual analysis and data processing.

The literature was selected using a purposive sampling technique, considering the relevance to the topic of Teaching Factory and the quality of the publications. The data sources included academic books, national and international journal articles, and relevant government policy documents. Data collection was performed through literature study and documentation. The data were analyzed using an interactive analysis technique, which included data reduction, data presentation in descriptive narratives, and conclusion drawing. To ensure data validity, the researcher utilized source triangulation by comparing various credible literary sources.

RESULTS AND DISCUSSION

The results of this literature review indicate that the Teaching Factory (TeFa) is a holistic pedagogical approach that effectively bridges the gap between vocational education and the culinary industry's expectations.

The Concept of Teaching Factory in Culinary Arts Vocational Education

A major theme in vocational education literature is the critical role of industrial-grade facilities in the success of Teaching Factory implementation. Ideally, a culinary TeFa should be equipped with

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professional appliances such as deck ovens, industrial mixers, and high-capacity cold storage that mimic the environments of five-star hotels or commercial bakeries. However, the literature also acknowledges that many vocational institutions, especially those in developing regions, face significant financial hurdles in procuring and maintaining these high-cost assets.

In reality, the Culinary Arts program at Universitas Muhammadiyah Muara Bungo currently operates with limited laboratory facilities, predominantly relying on household or domestic-grade appliances. This condition presents a unique challenge, as the "scaling gap" becomes evident when students transition from small-batch domestic cooking to the large-volume requirements of the industry. The use of domestic tools limits the students' exposure to industrial-scale machinery, potentially slowing down their adaptation when they enter the professional workforce. This lack of specialized equipment is a primary obstacle that the institution must address to fully realize the potential of the TeFa model.

To overcome these constraints, the program has adopted a strategy of "Pedagogical Resilience," where the focus shifts from the tools to the process. Even with domestic appliances, students are taught to follow strict industrial hygiene (HACCP) and safety protocols. The study suggests that for UMMUBA, the sustainability of TeFa can be achieved through a gradual upgrade plan funded by the commercialization of student-led culinary products. By starting small-scale production units, the program can generate revenue to slowly transition from household tools to professional equipment, ensuring that despite current limitations, the trajectory of vocational excellence remains on track.

Table 1. Comparison Analysis: Traditional Culinary Practice vs. Teaching Factory Model

Aspect	Traditional Pratical Learning	Teaching Factory Model (TeFa)
Learning Orientation	Completion of Basic Cooking Syllabus	Market - driven production standards
Product Purpose	Personal consumption/ instructor grading	Commercial distribution/ customer sale
Standardization	School-based academic rubrics	Industrial SOP & HACCP Standards
Working Atmosphere	Controlled classroom environment	Real industrial kitchen pressure
Assesment Basis	Individual technical skill score	Customer feedback & business profit
Time Management	Fixed academic hours (e.g., 08.00-12.00)	Flexible, based on production deadlines

Student Competency Development through Authentic Learning

Competency development in culinary vocational education through the TeFa model goes beyond mastering cooking techniques. Theoretically, TeFa is designed to integrate the development of professional character or soft skills required by the global hospitality and food service industry. Literature indicates that a learning environment that simulates industrial pressure significantly enhances student independence, responsibility, and

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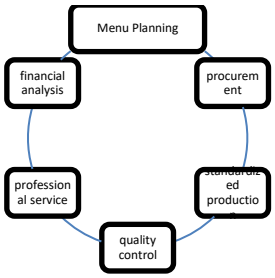
problem-solving abilities. Students do not just learn how to follow a recipe, but also how to manage time, communicate within a busy team, and maintain consistent product quality under strict supervision.

In Universitas Muhammadiyah Muara Bungo, this competency development faces unique dynamics due to laboratory facility limitations. However, this condition does not hinder the cultivation of an industrial mentality. Students are educated to apply strict hygiene and sanitation standards as well as high time discipline despite using simple tools. The main focus of learning at UMMUBA is on "process quality," where students are trained to have professional work ethics and precision. The equipment limitation actually serves as a means to train students' creativity and resilience in achieving maximum results with existing resources, which is a valuable asset when they adapt to the real industry later.

The impact of this approach is the transformation of more adaptive professional attitudes in students. Based on literature reviews, students accustomed to the TeFa model have higher confidence levels when undergoing field work practice (internships). At UMMUBA, although there is a technology gap between campus equipment and the industry, the integration of professionalism values in every practical session ensures that students are not only technically competent but also have work integrity. The success of this competency development proves that the core of the Teaching Factory is not merely about machine sophistication, but about creating a disciplined, measurable, and customer satisfaction-oriented learning ecosystem.



Implementation Models

Several models are identified in the literature for culinary vocational education:

a. **Campus-Based Production Units:** The study program manages a business unit, such as a bakery, pastry shop, or restaurant, that serves the public. Students manage the entire cycle from menu planning and ingredient procurement to financial reporting.
b. **Simulation of Industrial Kitchens:** For institutions with limited public access, the kitchen environment is strictly regulated to mimic industrial pressure, complete with time-bound production targets.
c. **DUDI (Industry) Collaboration:** Deep partnerships where the industry provides mentors, curriculum standards, or even places their production orders to be fulfilled by the students under supervision.

Strategic Challenges and Sustainability

As seen in the literature, the main challenge in implementing TeFa is the sustainability of equipment and the high cost of raw materials. To address this, the study identifies a "Circular Economic Model" where the revenue generated from the sale of culinary products is reinvested

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into the program to maintain kitchen facilities. This ensures that the technology used by students remains relevant to current industry trends.

The implementation of the Teaching Factory (TeFa) in culinary arts faces significant structural challenges, particularly regarding the availability of industrial-standard facilities. Theoretically, a successful TeFa must replicate the actual working environment of the industry to ensure students' psychological and technical readiness. However, the literature reveals a common gap in many developing vocational institutions where the transition from traditional learning to a production-based model is often hindered by the high cost of specialized kitchen equipment, such as deck ovens, high-capacity mixers, and professional cold storage systems.

In the context of the Culinary Arts Vocational Education Program at Universitas Muhammadiyah Muara Bungo, this challenge is acutely observed as the current laboratory facilities predominantly utilize domestic or household-grade appliances. While these tools allow for basic skill acquisition, they do not fully represent the high-pressure and high-volume demands of a commercial kitchen. This limitation necessitates a more creative pedagogical approach, where lecturers must simulate industrial workflows despite the hardware constraints. The reliance on domestic equipment often results in a "scaling gap," where students are proficient in small-batch production but may feel overwhelmed when transitioning to the large-scale industrial output required by hotels or professional catering services.

To bridge this facility gap, the study suggests a sustainability model based on strategic incremental upgrades funded through TeFa production revenue. By utilizing existing domestic tools to produce small-scale marketable goods, the institution can generate a revolving fund dedicated to procuring industrial-standard equipment. This gradual transformation is essential to ensure that the vocational program remains relevant. Furthermore, the literature emphasizes that while equipment is vital, the "industrial mindset"—such as discipline, hygiene standards, and work efficiency—can still be cultivated through strict SOPs, even when utilizing limited facilities. This strategic resilience is what allows vocational programs in regional areas to continue producing competitive graduates.

Integrating Industrial Standard Operating Procedures (SOP) in Limited Facilities

The integration of industrial SOPs remains the backbone of the Teaching Factory model, regardless of the hardware limitations. In culinary vocational education, SOPs cover more than just cooking; they encompass food safety management, personal hygiene, and workstations organization. According to the literature, the "Factory" aspect is successfully realized when students can replicate a professional workflow—starting from the *mise-en-place* (preparation) to the final cleaning of the station. At Universitas Muhammadiyah Muara Bungo, even though the equipment is domestic, the enforcement of professional SOPs ensures that students develop the "muscle memory" of a professional chef.

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The Role of Lecturer as an Industry Mentor

Another critical factor discussed in the literature is the shifting role of the lecturer. In a Teaching Factory environment, the lecturer must transition from a traditional teacher to an industry supervisor or "Executive Chef." This transformation requires the lecturer to not only master pedagogical skills but also possess current industrial insights and management capabilities. At UMMUBA, lecturers face the additional challenge of improvising industrial techniques using household appliances. The discussion suggests that the competency of the lecturer in bridging the gap between limited campus resources and high industrial standards is the primary catalyst for student success in a TeFa-based curriculum.

Economic Sustainability and Institutional Support

For a Teaching Factory to be sustainable, it must eventually generate its own operational funds. The literature points out that many vocational programs fail to sustain TeFa because they rely solely on government or institutional grants. A "Circular Economy" model is proposed, where the culinary products produced during practical sessions are marketed to a wider audience, such as campus staff, students, or local communities. The revenue generated from these sales can then be allocated to a dedicated fund for laboratory upgrades. At UMMUBA, this model represents a strategic pathway to move away from domestic-grade tools toward professional industrial machinery. By treating the laboratory as a small business unit, the institution not only improves its facilities but also provides students with real-world experience in financial management and entrepreneurship.

CONCLUSION

The implementation of the Teaching Factory (TeFa) in culinary arts vocational education at Universitas Muhammadiyah Muara Bungo represents a vital strategic synchronization between academic output and industrial reality. This study concludes that an effective TeFa model—characterized by standardized industrial SOPs and production-based learning—significantly enhances students' technical proficiency and professional mentalities. Following the perspective of Billett (2011) on workplace learning, the authenticity of the learning environment, although currently constrained by domestic-grade facilities, successfully fosters "industrial resilience" among students. The transformation of the student's role from a passive learner to a productive worker is the core success factor of this model.

Furthermore, this study highlights that facility limitations are not a definitive barrier but a strategic challenge that can be mitigated through "Pedagogical Resilience" and creative management by lecturers. As suggested by the Teaching Factory Paradigm (Chryssolouris et al., 2016), the essence of TeFa lies in the synergy between knowledge and production. Therefore, the long-term sustainability of the culinary program at UMMUBA depends on a gradual facility upgrade funded by a circular economic model. In conclusion, Teaching Factory is not merely a method but a comprehensive educational ecosystem that prepares vocational students to be adaptive, disciplined, and ready to face the dynamic challenges of the 21st-century global hospitality industry.

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