**Journal Evaluation in Education (JEE)**
Vol. 7, No. 1, January 2026, pp. 84~93
ISSN: 2716-4160, DOI: 10.37251/jee.v7i1.2209


Research Article

# Integrated Teaching Factory Management Model For Character Development in Vocational High Schools: A Study in Rejang Lebong Regency

**Sukarsih[1,*], Hendra Harmi[1], Jumira Warlizasusi[1]**
[1] Department of Doctoral Program in Islamic Education Management, Postgraduate, Institut Agama Islam Negeri (IAIN) Curup, Bengkulu, Indonesia

**Article Info**

***Article history:***

Received Oct 09, 2025
Revised Nov 03, 2025
Accepted Dec 09, 2025
OnlineFirst Jan 25, 2026

***Keywords:***

Character Development
Management
Teaching Factory
Vocational High Schools

**ABSTRACT**

**Purpose of the study:** The implementation of the Teaching Factory (TeFa) learning model in Vocational high school has developed as a key strategy to enhance the quality of industry-based vocational education. This study aims to analyze the planning, organizing, implementation, and supervision of the Teaching Factory in fostering students' character development in vocational schools in Rejang Lebong Regency.

**Methodology:** This research employed a descriptive qualitative approach with a case study strategy conducted in vocational high schools. Data were collected through interviews, observations, and documentation. The data were analyzed using the interactive model proposed by Miles and Huberman, which includes data collection, reduction, presentation, and conclusion drawing.

**Main Findings:** The findings revealed that TEFA planning begins with the development of human resource planning, financial planning, production planning, and marketing planning. The organizing process involves the active participation of teachers, students, and industrial partners to create a realistic work system while instilling positive character values such as discipline, responsibility, and teamwork. A tangible form of this organizing process is the establishment of the TeFa organizational structure.

**Novelty/Originality of this study:** The TEFA model has proven effective in cultivating work-ready character traits and supporting students' preparedness to enter the professional and entrepreneurial sectors. These findings provide a significant contribution to the advancement of holistic, character-based vocational education in Indonesia.



***Corresponding Author:***
Sukarsih,
Department of Doctoral Program in Islamic Education Management, Postgraduate, Institut Agama Islam Negeri (IAIN) Curup, Jl. Dr. Ak. Gani No.01, Dusun Curup, Rejang Lebong, Bengkulu, 39119, Indonesia
Email: sukarsih68@gmail.com

## 1. INTRODUCTION

Vocational education in Indonesia plays a strategic role in preparing a workforce that is ready for employment, as mandated by Government Regulation (PP) No. 66 of 2010, which emphasizes the specific characteristics of vocational schools in preparing their graduates to immediately enter the workforce [1], [2]. This vocational education policy adopts the German dual system, which seeks to systematically integrate school learning with industrial practical experience, aiming to achieve professional expertise through a combination of

theoretical knowledge and practical experience [3]. Through this approach, vocational schools are expected to contribute to national economic growth both through entrepreneurial activities and by facilitating graduate participation in the business and industrial sectors [4].

According to data from the Central Statistics Agency (BPS) in 2022, there is a positive correlation between the increasing number of vocational schools under the Ministry of Education, Culture, Research, and Technology and the growth of Regional Gross Domestic Product (PDRB). This confirms the strategic role of vocational schools in driving economic development. However, a paradox is evident in the high open unemployment rate (TPT) among vocational school graduates, which continues to show alarming variations. According to BPS, the TPT for vocational school graduates was 11.24% (August 2020), increasing to 12.65% (August 2021), then decreased to 9.84% (February 2022), but rose again to 11.41% (August 2023), before falling again to 8.92% (February 2024). This phenomenon indicates that there is a mismatch, or incompatibility, between the competencies of graduates and the needs of the world of work. In an effort to address this competency gap, the government initiated the establishment of school business units as part of practical entrepreneurship learning. This initiative was realized through the Teaching Factory (TeFa) model, which aims to produce graduates who are not only skilled and professional, but also capable of creating jobs [1], [5]. However, the fundamental issue lies not only in technical skills alone. Vocational education competencies include tasks, skills, attitudes, values, and critical appreciation for success in life and work. Thus, vocational competencies must include cognitive, affective, and psychomotor aspects integrated into the learning process [6].

It is in this context that character building becomes an essential mission of vocational schools. Character is a fundamental attribute that every individual must possess [7], and the learning process should not be limited to the transfer of knowledge from teacher to student [8], but must be oriented towards character development and moral values [9], [10]. The learning process needs to be tailored to the character of the students [11] and must be able to improve entrepreneurial character [12]. Teaching Factory (TeFa) emerged as a breakthrough in learning that integrates production or service activities into the learning process at school, creating an authentic work environment oriented towards the needs of industry and the market [13], [14]. This model aims to produce “work-ready” graduates through entrepreneurship education that is aligned with industry standards [15], [16]. Through this production-based learning, TeFa is expected to reduce the gap between school competencies and the needs of the world of work.

Theoretically, the effectiveness of TeFa is based on its alignment with experiential learning (Kolb) and situated learning (Lave & Wenger) theories. Experiential learning emphasizes meaningful learning through concrete experiences, reflection, conceptualization, and active experimentation, while situated learning views learning as a process of participation in real communities of practice. [17]. TeFa, by establishing “factories” in school environments, creates practical communities where students learn directly and situationally through the experience of producing real goods and services. TeFa depends on good management. Management covers the entire process of managing production-based learning activities, from planning, organizing, implementing, to supervising [18]. The POAC (Planning, Organizing, Actuating, Controlling) approach provides a comprehensive framework for analyzing TeFa management. Planning includes formulating production-based learning objectives, selecting services/products that are in line with expertise competencies, setting production targets, and adjusting learning schedules [14]. POrganization includes the division of roles between teachers, students, and industry partners, as well as the formation of the TeFa organizational structure [13]. The implementation consists of the production process and learning implementation in the school workshop. Supervision includes product quality monitoring, student performance assessment, and reflection on production results.

Through this POAC framework, TeFa can serve as a catalyst for character building in the workplace. Character in the workplace in the context of vocational education includes professional attitudes and behaviors such as discipline, responsibility, cooperation, perseverance, honesty, and a focus on quality and safety at work [19], [20]. Character building in vocational schools has two dimensions: personal character (discipline, independence, responsibility) and social-professional character (work ethic, communication, cooperation) [21]. That TeFa can develop the entrepreneurial character of students at vocational schools in Surabaya [20]. Fathurrohman [22], Muharam et al [23] and Wijanarka et al [24] emphasizing TeFa's contribution in improving students' discipline, responsibility, and communication skills. The synergy between TeFa and entrepreneurship education has been proven to increase students' work readiness by up to 75% [18].

However, when looking at regional contexts such as Rejang Lebong Regency, there are important research gaps. Most previous studies have concentrated on vocational schools in urban areas with adequate industrial support and infrastructure. TeFa must be implemented in regions with specific geographical characteristics, limited industrial access, and unique regional policies such as Rejang Lebong. However, there has not been much research on this issue. In addition, preliminary data shows that TeFa management in the regions still tends to focus on acquiring technical skills, while character building has not become a managerial priority that is planned and evaluated [25], [26].

This study aims to determine how teacher factory management practices within the POAC framework contribute to the work character of students at Rejang Lebong Vocational High School. (1) Examine the

implementation of TeFa management components (POAC) at Rejang Lebong Vocational High School; (2) To determine the form of work character created through TeFa; (3) To examine the relationship between TeFa management and work character formation; and (4) To identify supporting and inhibiting factors. This study is expected to produce a comprehensive and contextual conceptual model of TeFa management for the region by integrating experiential learning theory, workplace learning, and the POAC management framework. The results will provide a theoretical contribution to the development of vocational education and serve as a practical reference for education stakeholders in regions with similar characteristics.

## 2. RESEARCH METHOD

To investigate the complexity of implementing the Teaching Factory (TEFA), particularly in relation to character building and management aspects, this study uses a case study design [27]. This study was conducted in two public vocational schools in Rejang Lebong Regency: Vocational High School 7 (with BLUD status) and Vocational High School 6 (with a normal financial mechanism). These schools were deliberately chosen for this study to see how differences in institutional governance affect the implementation of TEFA. Data were collected through participatory observation, semi-structured interviews, and interviews with school leaders, teachers, and students. Consultation with peers, triangulation of sources and methods, and member checking ensured the credibility of the data [28].

Interview participants included one principal, all heads of vocational programs at Vocational High School A Rejang Lebong, consisting of Motorcycle Engineering, Light Vehicle Engineering, Accounting, Nursing, Computer and Network Engineering, and Agribusiness in Agricultural Product Processing, as well as three teachers from Vocational High School A Rejang Lebong.

Figure 1. Interview Procedure at Vocational High School A Rejang Lebong

At Vocational High School B, interviews were conducted with parties directly related to this study. These parties included one principal, all heads of vocational programs at Vocational High School B Rejang Lebong, namely Motorcycle Engineering, Light Vehicle Engineering, Heavy Equipment Engineering, Audio-Video Engineering, Health Support Services and Child Care, as well as Beauty and Hair Styling, along with three teachers from Vocational High School B Rejang Lebong. In addition, the researcher used a documentation study technique aimed at obtaining additional data so that the information collected would be more accurate and comprehensive.

Figure 2. Interview Procedure at Vocational High School B Rejang Lebong

## 3. RESULTS AND DISCUSSION

The findings of this study indicate that the implementation of the Teaching Factory (TEFA) model is effective in shaping students' character to become work-ready individuals and supports their readiness to enter the world of industry and entrepreneurship. These findings were achieved through effective TEFA management, which includes planning, organizing, implementing, and supervising [29], With the support of qualified teachers, adequate facilities, collaboration with the business and industrial world (DUDI), visionary leadership, a positive school culture, and active students. This study provides a more in-depth analysis of how TEFA management functions as a strategic tool for building student character, particularly in vocational schools. The results show that not only does TEFA learning have a significant impact, but it also helps develop comprehensive, character-based vocational education in Indonesia.

Teaching Factory (TEFA) management in vocational schools begins with planning that focuses not only on resources such as human resources, finance, production, and marketing, but also on character building, including discipline, responsibility, and cooperation. The organizational stage involves collaboration between teachers, students, and industry partners in an effort to create a realistic industrial work system [30]. Next, the implementation stage integrates the school curriculum with industry standards, including the application of Standard Operating Procedures (SOPs) [31], [32] and occupational safety training [33], [34]. The final stage is routine monitoring by teachers to assess student performance, attitude, and output, with the aim of identifying developing character traits [35] and assess the effectiveness of the program. In the management cycle, these four functions work together and focus on achieving overall student competency; this includes knowledge, skills, and attitudes.

The success of this model is also influenced by a number of supporting factors. These factors include experienced teachers, the availability of adequate educational facilities, visionary school leadership, a positive school culture, and active student participation. This study was conducted in two locations: Vocational high school A Rejang Lebong served as the main location and Vocational high school B Rejang Lebong served as the companion location. Comparative analysis shows that the two schools have different approaches to management, leadership, work culture, and TEFA implementation strategies. The effectiveness of the program has a direct impact on student character. Overall, Vocational high school A and Vocational high school B Rejang Lebong have different approaches and implementations of Teaching Factory (TEFA). Vocational high school A, which does not yet have BLUD status, runs TEFA with few internal regulations. Its implementation focuses more on achieving production targets and understanding industrial culture. This occurs in a place where student character building is still implicit and partnerships with industry are still conventional. In contrast, Vocational high school B uses its BLUD status to create a more independent and positive TEFA environment. The implementation strategy, driven by entrepreneurial leadership, pursues production output and character development through SOPs and systematic assessments. This method is based on a strong work culture and strategic collaboration with industry.

Therefore, there are differences in regulations and leadership that cause different differences in work culture and TEFA effectiveness. Vocational high school A is still in the process of strengthening its foundation to achieve the same level of integration, while Vocational high school B has developed a more mature ecosystem where character values are developed in a measurable and sustainable manner. Based on this comparative analysis, the following are detailed findings and analyses enriched with theory and empirical evidence for each school.

### 3.1 Analysis of Teaching Factory (TEFA) Implementation at Vocational high school A and B

Research data collected on Teaching Factory (TEFA) planning for character building at Vocational high school A Rejang Lebong was analyzed to obtain information and explanations regarding field phenomena related to TEFA management in fostering student character. Based on the analysis, TEFA management at Vocational high school A Rejang Lebong refers to four core management functions, which include planning, organizing, implementing, and supervising. At the planning stage, the school determines the positions that must be filled, considers the competencies and number of teachers needed, and plans financial and budgeting aspects [36]. One of the planners stated, “We plan TEFA carefully, from team formation and equipment requirements to budget estimates, so that production and learning activities run effectively” (Interview with the Head of APHP Competency, February 17, 2025). The next stage is organization, where the organization of TEFA learning in this school is carried out through the issuance of a Work Order (SPK). This document outlines the specific responsibilities assigned to the TEFA management team. The TEFA program's systematically structured organizational structure is as follows:

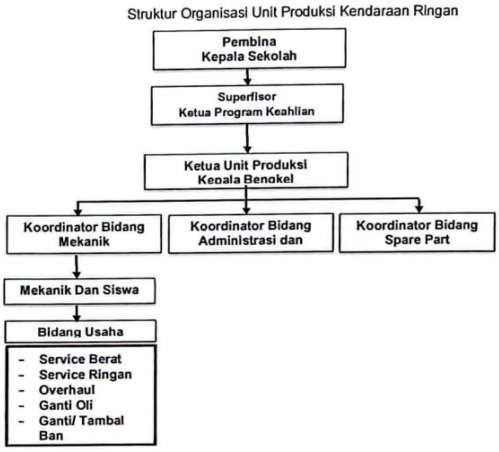


Figure 3. TeFa Organizational Structure at Vocational high school A Rejang Lebong

Once the organizational structure is in place, students are directly involved in the implementation process under the supervision of their supervising teachers, in accordance with the established Standard Operating Procedures (SOPs).

Figure 4. TeFa Implementation at Vocational high school A Rejang Lebong

The evaluation results show that the implementation of Teaching Factory (TEFA) at Vocational high school A Rejang Lebong has been running well and is considered effective in fostering positive work characteristics in students. One of the productive teachers said, “Through TEFA, I see a change in the students' attitudes. They have become more disciplined in following procedures and taking responsibility for the tasks assigned to them” (Interview with TKR Productive Teacher, February 18, 2025). Following implementation, the next stage is monitoring, which is carried out by setting service standards and ensuring that TEFA operations are in line with the established criteria. Based on the research conducted, the results of the observations were summarized to present the level of achievement of TEFA implementation at Vocational high school A Rejang Lebong.

Table 1. Summary of Observation Results on TEFA Implementation Achievements at Vocational high school A

| No | Parameter | Average Score | Category |
|---|---|---|---|
| 1 | Management | 4.00 | Good |
| 2 | Practice Room | 3.60 | Good |
| 3 | Learning Model | 2.71 | Fair |
| 4 | Marketing/Promotion | 3.30 | Fair |
| 5 | Product/Service | 3.25 | Fair |
| 6 | Human Resources | 2.80 | Fair |
| 7 | Industrial Relations | 2.83 | Fair |
| | Total | 3.21 | Fair |

Using a rating scale of 1 to 5, the implementation of TEFA at Vocational high school A Rejang Lebong tends to fall into the “Fair” category. This indicates that TEFA has been implemented adequately, but not optimally. One of the main problems identified is the limitation of facilities and infrastructure that do not fully

meet industry standards. Because production-based learning activities require the use of tools, materials, and a work environment that are comparable to real industry conditions, the availability of adequate facilities is very important to support the implementation of TEFA. Inadequate facilities prevent students from gaining significant learning experiences in using advanced equipment and applying work procedures that comply with industry standards. As a result, the learning process often focuses more on producing saleable products than on improving students' skills and character.

Limited facilities and infrastructure that do not meet industry standards are the main obstacles in implementing the Teaching Factory (TeFa) at Vocational high school A Rejang Lebong. Students are unable to practice using advanced equipment and apply actual work procedures due to these limitations. As a result, the focus of learning is usually more on developing students' attitudes and basic skills rather than producing marketable goods. Vocational high school A recognizes this and has taken strategic measures to balance production orientation with character building. Concrete efforts include upgrading facilities in collaboration with industry partners and obtaining support from the local government. In addition, the school utilizes the concept of industry connectivity, which allows students to gain hands-on experience and learn in the environment of industry partners.

The school is not only updating its infrastructure; it is also innovating the learning process by incorporating the principles of character education and entrepreneurship into production activities. This approach transforms the role of teachers from being merely technical instructors to moral mentors who instill the value of professionalism. Character values such as honesty, empathy, and responsibility for product quality are formed contextually through this integration. During each stage of the work process, students see character building directly and not just theoretically. This produces graduates who are not only technically proficient but also have strong character.

Furthermore, supervision and evaluation in the implementation of TeFa are strengthened by involving all stakeholders, including productive teachers, heads of expertise programs, and industry partners [37], [38]. Evaluation is not limited to production achievements but also includes indicators of student behavior during the learning process. A character-based assessment system is applied to evaluate various aspects, such as cooperation, discipline, responsibility, and creativity. Through this holistic evaluation, schools can monitor students' character development and identify areas that require further guidance.

These improvement efforts demonstrate that Vocational high school A Rejang Lebong is committed to implementing TeFa and consistently building character. In the long term, it is hoped that this approach will improve the overall quality of vocational learning by making schools not only centers for technical training but also laboratories for building work ethic and entrepreneurship. Therefore, Vocational high school A graduates will not only have skills, but also strong personalities, honesty, creativity, and the ability to adapt to challenges in an ever-changing work environment.

However, there are still several problems. Some of the identified obstacles include inadequate facilities and infrastructure that do not meet industry standards, as well as an excessive focus on production aspects, which sometimes causes students' character values such as honesty, empathy, and teamwork to be neglected. Therefore, the learning process can become inflexible and does not reflect entrepreneurial character values. This is a major obstacle to the implementation of TEFA. As a result, Vocational high school A Rejang Lebong continues to strive to overcome this problem by improving the completeness of facilities and infrastructure and creating learning activities that place more emphasis on student character development while remaining focused on production and industry value standards.

### 3.2. Manajemen TEFA di Vocational high school B Rejang Lebong

Based on research conducted at Vocational high school B Rejang Lebong, which operates under the status of a Regional Public Service Agency (BLUD), the school has successfully implemented Teaching Factory (TEFA) management effectively through four main stages: planning, organizing, implementing, and monitoring. Overall, these four factors contribute to effective TEFA management by ensuring systematic planning that includes determining the position, competence, and number of teachers, as well as budget policies. By issuing a Work Order (SPK), TEFA management is organized effectively, facilitating coordination during the implementation and monitoring process. The implementation of TEFA at Vocational high school B Rejang Lebong focuses on real production activities that directly involve students in work practices, under the guidance of teachers who ensure compliance with established Standard Operating Procedures (SOPs). A student participating in TEFA said, “I feel like I'm really working in the industry. Everything must comply with SOPs, be on time, and the results must be of high quality. This trains our discipline and responsibility” (Results of Student Observation and Interviews, February 24, 2025).

Figure 5. TEFA Implementation at Vocational high school B Rejang Lebong

The monitoring stage is carried out by establishing service standards and operational procedures that enable verification of alignment between planning and implementation, while maintaining product quality. This success is further supported by the institutional status of Vocational high school B Rejang Lebong as a Regional Public Service Agency, which provides greater flexibility in financial management and operational decision-making. The Vocational high school of Vocational high school B emphasized, "BLUD status allows us to manage finances independently and flexibly. We can directly use the proceeds from the TEFA production unit for facility development and learning quality improvement, without going through complicated bureaucracy" (Interview with the principal of Vocational high school B, February 20, 2025).

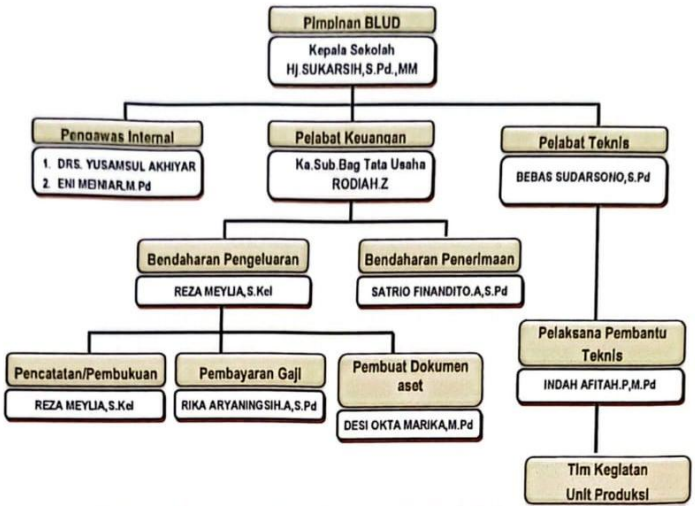


Figure 6. TeFa Implementation at Vocational high school B Rejang Lebong

This factor contributed significantly to the success of Vocational high school B in effectively implementing Teaching Factory (TEFA) management. BLUD status provides institutional flexibility, allowing schools to independently manage the income generated from TEFA production activities. This income can then be reinvested in operational activities and program improvements without the obligation to deposit it into the state treasury. Based on the research conducted, the results of the observations were summarized to describe the level of achievement of TEFA implementation at Vocational high school B Rejang Lebong.

Table 2. Summary of Observation Results on TEFA Implementation Achievements at Vocational high school B

| No | Parameter | Average Score | Category |
|---|---|---|---|
| 1 | Management | 3.8 | Good |
| 2 | Practice Room | 4.8 | Excellent |
| 3 | Learning Model | 4.0 | Good |
| 4 | Marketing/Promotion | 4.7 | Excellent |
| 5 | Product/Service | 4.5 | Excellent |
| 6 | Human Resources | 4.2 | Good |
| 7 | Industrial Relations | 4.5 | Excellent |
| | Total | 4.36 | Good |

Using a rating scale of 1 to 5, the implementation of Teaching Factory (TEFA) at Vocational high school B Rejang Lebong achieved a "Good" rating. The effectiveness of TEFA management at Vocational high school B is associated with several supporting factors, one of which is the school's institutional status as a Regional Public Service Agency (BLUD). This status provides greater authority and flexibility for the institution in managing its budget and revenue. In addition, adequate teacher competence, complete facilities and infrastructure, and strong support from stakeholders also play an important role in ensuring the effectiveness of TEFA implementation and management at the institution.

The results of the study show that the Teaching Factory (TeFa) program at Vocational high school B Rejang Lebong has shown significant progress and can have a positive impact on improving students' technical competencies. However, the findings of the study indicate that there are certain inhibiting factors that affect the overall effectiveness of the program, and these inhibiting factors must be analyzed thoroughly because they can hinder the achievement of the main objectives of TeFa, which are unavoidable. The implementation of the Factory of Instruction (TeFa) at Vocational high school B Rejang Lebong faces a number of important problems. The first is infrastructure and facilities that do not meet industry standards. The simulation of the work environment is not ideal due to limited practical equipment, inadequate space, and unsustainable materials, especially in programs such as Heavy Equipment Engineering and Beauty Care. In addition to disrupting students' mastery of skills, this hinders the application of industry standards such as discipline and quality responsibility.

In addition to facility issues, another obstacle is the uneven competence of teachers. The conventional approach based on knowledge transfer, rather than contextual learning based on work experience, is still used by many productive teachers. They are not ready to carry out their new roles as facilitators, mentors, and models of industrial work. As a result, this separates the objectives of TeFa from its implementation in the field. Third, the TeFa evaluation system does not have comprehensive character assessment standards. Character aspects such as honesty, empathy, and cooperation are still not measured systematically, and production results and technical abilities remain the focus of assessment. As a result, students' soft skills are often neglected, even though the industrial world attaches great importance to them. In addition, becoming too focused on production targets is a problem in itself. Often, the learning process becomes rigid and mechanical due to the pressure to meet order quantities. Teachers and students only focus on completing orders. This situation hinders in-depth character value training, inhibits creativity, and prevents students from reflecting on the social and moral meaning of their work.

Vocational high school B Rejang Lebong has addressed this issue by taking several strategic steps to improve the implementation of TeFa, both in terms of facilities and learning methods. The first step is to improve the infrastructure and practical facilities to meet industry standards. To obtain assistance with equipment and improve the learning infrastructure, the institution works strategically with industry partners and local government. New practical equipment and opportunities for teachers and students to conduct direct field work practice in partner industries are the benefits of this collaboration for several skill programs. The goal of this program is to create a learning environment that is more reasonable and in line with the needs of the world of work. In addition to improving their infrastructure, educational institutions have also started programs to improve the skills of their teachers. They do this through internal training and collaboration with the industrial sector [39], [40].

This training helps teachers become better at managing production activities, creating industry-based project plans, and objectively assessing students' character traits. Through exemplary behavior, empathetic communication, and continuous guidance during the learning process, teachers are encouraged to act as agents of character development. The next step is to develop a character evaluation system that is appropriate for TeFa activities. Schools have begun to create rubric-based assessment tools that contain metrics such as honesty, empathy, cooperation, discipline, and responsibility. During production activities, this assessment process is carried out continuously through direct observation. Thus, student character development is measured through processes, social interactions, and daily work principles.

Another step that followed involved a shift in TeFa learning, from a production-oriented focus to learning that combines productivity with moral development. Teachers are allowed the freedom to design activities that encourage students to innovate, discuss, and reflect on their work experiences. The formal and rigid learning process is gradually being reoriented towards a more dynamic, contextual, and humanistic process. Through these various efforts, the implementation of TeFa at Vocational high school B Rejang Lebong has begun to show progress in terms of effectiveness, both in the context of industrial achievement and strengthening student character. Students not only demonstrate technical skills but also develop an awareness of the importance of moral and social values in the context of work. Values such as honesty, empathy, and cooperation are beginning to be integrated as vital components of the learning culture at the school. Through collaboration between infrastructure improvement, teacher competency enhancement, and character assessment integration, Vocational high school B Rejang Lebong has the potential to become an example of balanced TeFa implementation between industry orientation and character development in vocational education.

## 4. CONCLUSION

A comprehensive analysis of the implementation of the Factory of Instruction (TEFA) at the Rejang Lebong District Vocational School concluded that effective TEFA management, which includes planning, organizing, implementing, and supervising, has proven to be a strategic tool for improving technical skills and creating a strong work ethic among students. By combining these four management functions, a learning ecosystem instills the values of discipline, responsibility, honesty, cooperation, and independence in a real industrial context. Important supporting factors, such as teacher expertise, adequate facilities, strong and sustainable industry collaboration, visionary leadership, and a positive school culture, greatly influence this success. These results theoretically strengthen and develop the vocational education management model by showing how the classic POAC (Planning, Organizing, Actuating, and Controlling) functions can be expanded to include character building as a measurable outcome. This opens new eyes to the reality that TEFA management is an integrated, value-based management system. Practically, this research provides an operational model that can be used by vocational school administrators and policymakers (Ministry of Education, Culture, Research, and Technology) to create guidelines for implementing character-based TEFA nationwide. This model emphasizes planning that incorporates character development indicators, strategic industry partnerships that go beyond industrial work practices, a holistic evaluation system that includes behavioral and technical elements, and financial autonomy (such as BLUD status) to support innovation and flexibility. Further research is needed to test the effectiveness of this character-based TEFA management model in various geographical contexts and more diverse fields of expertise. In addition, the development of more standardized character assessment instruments for the TEFA context is an important agenda in supporting objective and comprehensive evaluation in the future.

## ACKNOWLEDGEMENTS

The author would like to express sincere gratitude to all respondents and stakeholders who have given permission and opportunity to conduct research on Teaching Factory Management in Student Character Development in Vocational High Schools in Rejang Lebong Regency. Thanks are also extended to the Promoter, Co-promoter, and all lecturers of the Doctoral Program in Islamic Education Management, Postgraduate Program, Curup State Islamic Institute, as well as all individuals and groups who have contributed to the success of this research.

## AUTHOR CONTRIBUTIONS

S was responsible for the research design, data collection, data analysis, and manuscript preparation. HH and JW, contributed to conceptual development, research methodology guidance, and critical review of the manuscript. All authors have read and approved the final version of the manuscript.

## CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

## USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

## REFERENCES

[1] M. R. A. Manurung, "The development of e-learning model web-based mathematics student worksheets (LKPD) to increase learning motivation of vocational school students," *Indonesian Journal of Education and Mathematical Science*, vol. 3, no. 2, pp. 56-61, 2022, doi: 10.30596/ijems.v3i2.11083.

[2] A. Amini, M. Marliani, E. Elfrianto, and I. Kemal, "Work motivation and work discipline on teachers' performance in state vocational schools," *Al-Ishlah: Jurnal Pendidikan*, vol. 14, no. 2, pp. 2271-2280, 2022, doi: 10.35445/alishlah.v14i2.1467.

[3] Y. Yasdin, and M. Muksins, "Political paradigms and vocational education policy in Indonesia: A document analysis," *Quality Education for All*, vol. 1, no. 1, pp. 204-221, 2024, doi: 10.1108/QEA-10-2023-0007.

[4] A. B. D. Dethan, D. B. Pandie, and W. Djani, "Vocational high school revitalization policy implementation in kupang district," *Journal of Tourism Economics and Policy*, vol. 3, no. 2, pp. 119-131, 2023, doi: 10.38142/jtep.v3i2.616.

[5] H. Sofyan, *Metodologi pembelajaran kejuruan [Vocational learning methodology]*. UNY Press, 2015.

[6] D. Kesuma, *Pendidikan Karakter: Kajian Teori dan Praktik di Sekolah [Character Education: A Study of Theory and Practice in Schools]*. Remaja Rosdakarya, 2011.

[7] M. Samani and H. Hariyanto, *Konsep dan Model Pendidikan Karakter [Character Education Concepts and Models]*. Remaja Rosdakarya, 2012.

[8] D. Lazwardi, "Manajemen kurikulum sebagai pengembangan tujuan pendidikan [Curriculum management as the development of educational goals]," *Al-Idarah J. Kependidikan Islam*, vol. 7, no. 1, pp. 119–125, 2017, doi: 10.24042/alidarah.v7i1.1112.
[9] E. F. Sari, F. Koda, I. Shofwan, and D. N. Tyas, "TPACK-Based team based project learning design in improving digital literacy skills," *J. Nonform. Educ.*, vol. 10, no. 2, pp. 402–413, 2024, doi: 10.15294/jone.v10i2.10988.
[10] A. Alimron, S. A. Syarnubi, and M. Maryamah, "Character education model in islamic higher education", *Al-Ishlah: Jurnal Pendidikan*, vol. 15, no. 3, pp. 3334-3345, 2023, doi: 10.35445/alishlah.v15i3.1452.
[11] A. Astalini, D. Darmaji, D. A. Kurniawan, and S. E. Septi, "Overview the inquiry learning model: Attitudes, student characters, and student responses what's the impact?," *Journal of Education and Learning (EduLearn)*, vol. 17, no. 1, pp. 85-92, 2023, doi: 10.11591/edulearn.v17i1.20530.
[12] J. Liu, Y. Zhu, M. G. Serapio, and S. T. Cavusgil, "The new generation of millennial entrepreneurs: A review and call for research," *Int. Bus. Rev.*, vol. 28, no. 5, pp. 1–10, 2019, doi: 10.1016/j.ibusrev.2019.05.001.
[13] A. S. Patria, N. Krisitiana, E. Ekohariadi, A. Sutiadiningsih, and M. B. T. Sampurno, "Teaching factory management on vocational high school case study: Arts and creative industry competency," *SAR J. - Sci. Res.*, pp. 29–35, 2024, doi: 10.18421/SAR71-05.
[14] S. Wahjusaputri and B. Bunyamin, "Development of teaching factory competency-based for vocational secondary education in Central Java, Indonesia," *Int. J. Eval. Res. Educ. IJERE*, vol. 11, no.1, 2022, doi: 10.11591/ijere.v11i1.21709.
[15] D. Mourtzis, N. Panopoulos, and J. Angelopoulos, "A hybrid teaching factory model towards personalized education 4.0," *International Journal of Computer Integrated Manufacturing*, vol. 36, no. 12, pp. 1739-1759, 2023, doi: 10.1080/0951192X.2022.2145025.
[16] Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, *Panduan teknis teaching factory*. 2017.
[17] A. Kautsar, G. Wiyono, M. Mulia, M. Iqbal, and M. Al-Fairusy, "Teaching factory model development in vocational high schools," *Al-Ishlah: Jurnal Pendidikan*, vol. 14, no. 4, pp. 6347-6360, 2022, doi: 10.35445/alishlah.v14i4.2461.
[18] G. N. I. P. Pratama, M. B. Triyono, B. R. Setiadi, E. A. Wibawa, I. L. Milansari, C. Dinata, and T. F. Prihandini, "A systematic literature review on implementation of teaching factory model in vocational education," *WSEAS Transactions on Business and Economics*, vol. 22, pp. 708–718, 2025, doi: 10.37394/23207.2025.22.62.
[19] A. Purwanto, D. Novitasari, and M. Asbari, "The role of leadership, teaching factory (TEFA) program, competence of creative products and entrepreneurship on entrepreneurial interest of the vocational school students." *International Journal of Social and Management Studies*, vol. 3, no. 5, pp. 58-64, 2022, doi: 10.5555/ijosmas.v3i5.185.
[20] S. Wahjusaputri, T. I. Nastiti, B. Bunyamin, and W. Sukmawati, "Development of artificial intelligence-based teaching factory in vocational high schools in Central Java Province," *Journal of Education and Learning (EduLearn)*, vol. 8, no. 4, pp. 1234-1245, 2024, doi: 10.11591/edulearn.v18i4.21422.
[21] S. R. Setiyorini and D. Setiawan, "Perkembangan kurikulum terhadap kualitas pendidikan di Indonesia [Curriculum development towards the quality of education in Indonesia]," *J. Teknol. Pendidik.*, vol. 1, no. 1, 2023, doi: 10.47134/jtp.v1i1.27.
[22] T. Tanti, W. Utami, D. Deliza, and M. Jahanifar, "Investigation in vocation high school for attitude and motivation students in learning physics subject," *Journal Evaluation in Education (JEE)*, vol. 6, no. 2, pp. 479-490, 2025, doi: 10.37251/jee.v6i2.1452.
[23] B. S. Wijanarka, F. Wijarwanto, and P. N. Mbakwa, "Successful implementation of teaching factory in machining expertise in vocational high schools," *Jurnal Pendidikan Vokasi*, vol. 13, no. 1, pp. 1-13, 2023, doi: 10.21831/jpv.v13i1.51811.
[24] B. S. Wijanarka, F. Wijarwanto, and P. N. Mbakwa, "Successful implementation of teaching factory in machining expertise in vocational high schools," *J. Pendidik. Vokasi*, vol. 13, no. 1, pp. 1–13, 2023, doi: 10.21831/jpv.v13i1.51811.
[25] D. A. Kurniawan, A. Astalini, D. Darmaji, T. Tanti, and S. Maryani, "Innovative learning: Gender perception of e-module linear equations in mathematics and physics," *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 92-106, 2022, doi: 10.23917/ijolae.v4i2.16610.
[26] M. S. P. Hasibuan, *Manajemen dasar, pengertian dan masalah*. Bumi Aksara, 1984.
[27] S. Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D*. Bandung: Alfabeta, 2019.
[28] D. M. Hasan *et al.*, "METODE PENELITIAN KUALITATIF".
[29] T. H. Handoko, *Manajemen I*. BPFE, 2001.
[30] I. N. Saputro, "Literature review of the development of a green campus teaching factory-based learning model in vocational schools in Indonesia," *QALAMUNA: Jurnal Pendidikan, Sosial, dan Agama*, vol. 16, no. 1, pp. 65-76, 2024, doi: 10.37680/qalamuna.v16i1.3438.
[31] T. Tanti, D. Deliza, and S. Hartina, "The effectiveness of using smartphones as mobile-mini labs in improving students' beliefs in physics," *JIPF (Jurnal Ilmu Pendidikan Fisika)*, vol. 9, no. 3, pp. 387-394, 2024, doi: 10.26737/jipf.v9i3.5185.
[32] C. A. Prosser and T. H. Quigley, *Vocational education in a democracy*, Rev. American Technical Society, 1950.
[33] S. Wahjusaputri, T. I. Nastiti, B. Bunyamin, W. Sukmawati, and J. Johan, "Development of teaching factory model-based artificial intelligence: improving the quality of learning vocational schools in Indonesia," *AL-ISHLAH: Jurnal Pendidikan*, vol. 16, no. 4, pp. 5173-5183, 2024, doi: 10.35445/alishlah.v16i4.5979.
[34] T. H. Retnowati, D. Mardapi, and B. Prihadi, "Dimensi karakter dalam penilaian proses berkarya seni lukis peserta didik sekolah menengah kejuruan [Character dimensions in assessing the painting process of vocational high school students]," *Imaji*, vol. 15, no. 2, 2018, doi: 10.21831/imaji.v15i2.18845.

[35] R. I. Kemendikbud, “SMK pusat keunggulan terus tingkatkan relevansi mutu lulusan dengan kebutuhan DUDI [Vocational schools as centers of excellence continue to improve the relevance of graduate quality to the needs of the industrial world.],” *Siar. Pers*, no. 547/sipres/A6/X/2023, 2023.
[36] S. Sukardi, *Evaluasi Pendidikan: Prinsip dan Operasionalnya [Educational Evaluation: Principles and Operations]*. Bumi Aksara, 2015.
[37] Y. Yoto, M. Marsono, A. Qolik, and A. Romadin, “Evaluation of teaching factory using CIPP (Context, Input, Process, Product) model to improve vocational high school students’ skills,” *J. Pendidik. Vokasi*, vol. 14, no. 1, pp. 12–28, 2024, doi: 10.21831/jpv.v14i1.62573.
[38] I. Isnandar, M. A. Ichwanto, and M. M. A. Ansyorie, “Sister-cousin TF model based on the influence of work preparedness and learning outcome,” *Soc. Sci. Humanit. Open*, vol. 8, no. 1, p. 100722, 2023, doi: 10.1016/j.ssaho.2023.100722.
[39] S. Ubaidah, S. Trisnamansyah, H. S. Insan, and N. Harahap, “Partnership management between vocational schools with the world of business and industry to improve the quality of graduates who are ready to work,” *Int. J. Nusant. Islam*, vol. 9, no. 1, pp. 58–69, 2021, doi: 10.15575/ijni.v9i1.11818.
[40] Y. Rinawati, A. Suriansyah, and N. Ngadimun, “School partnership management in improving vocational school education quality with teaching factory in Tabalong District, South Kalimantan Province,” *J. K6 Educ. Manag.*, vol. 4, no. 1, pp. 37–50, 2021, doi: 10.11594/jk6em.04.01.04.
[41] J. Warlizasusi, I. Fathurrochman, “Strategic management of the regional inspectorate as an effort to improve transparent and accountable education governance”, *Int Jour edu Research and Dev*, vol. 5, no. 2, pp. 143–152, 2025, doi: 10.52760/ijerd.v5i2.116.
[42] J. Warlizasusi, I. Ifnaldi, N. Nuzuar, A. Qodri, and H. S. Utami, "Developing academic writing learning module to improve writing skills of graduate program students,” *Ta'dib*, vol. 26, no. 2, pp. 391-404. 2025, doi: 10.31958/jt.v26i2.10496.
[43] G. Alamsya, L. Asha, I. Ifnaldi, J. Warlizasusi, and I. Fathurrochman, “Strategic management of the police academy (sekolah polisi negara) polda bengkulu in enhancing student quality”, *Int. J. Educ. Manag. Innov*., vol. 6, no. 3, pp. 298–309, 2025, doi: 10.12928/ijemi.v6i3.14468.
[44] C. Letavia, D. D. Saputri, and I. Fathurrochman, “Pemasaran jasa pendidikan berbasis nilai: Kajian teoritis dan empiris pada pondok pesantren Indonesia [Value-based marketing of educational services: A theoretical and empirical study of Indonesian Islamic boarding schools]”, *TARBAWI*, vol. 16, no. 1, 2025, doi: 10.36781/tarbawi.v16i01.