



The Key Factor that Determines the Success of VHS in Implementing the Indonesian Teaching Factory Learning Model

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ABSTRACT

In recent years, vocational education, particularly in vocational high schools (VHS), has received special attention from all stakeholders in Indonesia. The existence of the Vocational High School Revitalization program in 2016 and the New Teaching Factory (TEFA) program in 2021 demonstrates this. As a result, several schools are attempting to implement The Teaching Factory learning model, which is supported by all stakeholders. However, not all VHS have successfully implemented this learning model. This study was conducted to identify the factors possessed by VHSs that successfully implemented the Teaching Factory learning model. The qualitative research method was used at a VHS in Surakarta, with a case study approach. In-depth interviews with informants, observation, and documentation were used to collect research data. School principals, deputy principals, TEFA coordinators, teachers, and students in grades X, XI, and XII were among the informants. Miles and Huberman elaborate on the Yin methods used for data analysis. Nvivo 12 Plus is being used to organize data. The findings revealed that the determinants of VHS's success in implementing the Teaching Factory learning model were discipline, passion, innovation, honesty, and curriculum synchronization.

Keywords: *Vocational, Teaching factory, Implementing, Learning, Model.*

1. INTRODUCTION

According to Article 15 of the National Education System Law Number 20 of 2003, the existence of Vocational High Schools (VHS) is intended to prepare graduates to work in specific fields [1]. This demonstrates that the Vocational High School (VHS) strives to produce graduates who are prepared to work, whether independently, as entrepreneurs, or in companies or industries. Vocational High Schools (VHS) are required to produce graduates who meet the expectations of schools, society, and the business and industrial world. Graduates of Vocational High School (VHS) students with work competence in their fields, adaptability, and high competitiveness are needed as prospective workers.

Between 2009 and 2014, approximately 3,000 new VHSs were manufactured. The number of Vocational High Schools (VHS) in Indonesia has now reached 13,379, with 3,645 State VHS and 10,734 Private VHS [2]. Based on these data, it can be concluded that private schools account for 80% of total VHS status, while state schools account for 20%. This will determine the success of the management of Vocational High Schools with private status in maintaining the VHS's overall reputation. The increased number of VHS establishments demonstrates that the image of vocational education remains excellent and in demand among Indonesians.

According to the primary educational data source, the interest of prospective VHS students is increasing by approximately 250,000 applicants each year. However, the average number of prospective students that VHS

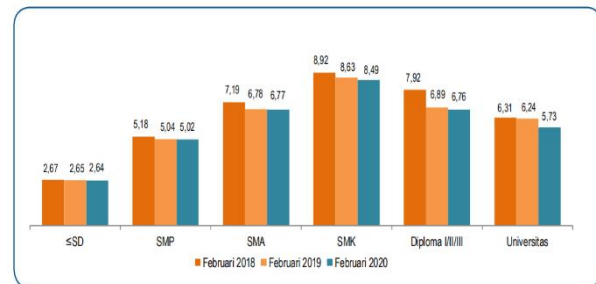
can accommodate is only 200,000 [3]. Because there are only so many schools, classrooms, and teachers, not all prospective students can be accepted at VHS. Access and the number of VHS educational units remain issues that must be addressed immediately. They are spread across 9 VHS expertise programs, including Technology and Engineering, Information and Communication Technology, Health, Agribusiness and Agrotechnology, Fisheries and Maritime Affairs, Business and Management, Tourism, Fine Arts and Crafts, and Performing Arts, based on the number of existing students.

The majority of students come from the existing areas of expertise in Technology and Engineering (34%), Information and Communication Technology (22%), and Business Management (26.5%), accounting for 82.5% of the total. Meanwhile, 17.5% of all students are studying in the fields of Health, Agribusiness and Agrotechnology, Fisheries and Maritime Affairs, Tourism, Fine Arts and Crafts, and Performing Arts. The small number of enthusiastic supporters for the three expertise programs is generally related to previous development priority policies, namely when only the manufacturing industry received attention and became the preferred major of prospective students without considering the potential of other industries that could bring prosperity to the Indonesian people.

According to the primary educational data source, there is an increase of around 250,000 applicants each year in the interest of prospective VHS students. However, the average number of prospective students that VHS can accommodate is only 200,000 [3]. Because there are only so many schools, classrooms, and teachers, not all prospective students can be accepted at VHS. Access and the number of VHS educational units remain issues that must be addressed immediately. The existing students are spread across nine VHS expertise programs, including: Technology and Engineering, Information and Communication Technology, Health, Agribusiness and Agrotechnology, Fisheries and Maritime Affairs, Business and Management, Tourism, Fine Arts and Crafts, and Performing Arts are just a few of the fields covered by the AA. The majority of students come from the existing areas of expertise in Technology and Engineering (34%), Information and Communication Technology (22%), and Business Management (26.5%), accounting for 82.5% of the total. Meanwhile, 17.5% of all students are studying in the fields of Health, Agribusiness and Agrotechnology, Fisheries and Maritime Affairs, Tourism, Fine Arts and Crafts, and Performing Arts. The small number of enthusiasts for the three expertise programs is generally related to previous development priority policies, specifically when only the manufacturing industry received attention and became the favorite major of prospective students without paying attention to the potential of other

industries that could bring prosperity to the Indonesian people.

The large number of prospective students that follows the establishment of new vocational high schools is inversely proportional to the reputation of current VHS graduates. According to data from the



Indonesian Central Bureau of Statistics (BPS) [4] the open unemployment rate for VHS graduates remains the highest, reaching 8.49% when compared to other school graduates. This issue is of great concern to all educational policymakers, particularly those in Vocational High Schools (VHS). This is depicted in the diagram below.

Figure 1. Data on the unemployment rate [4].

Another issue that prospective VHS graduates face is the rapid and disruptive emergence of the phenomenon of the industrial revolution 4.0. The role of the industry that will absorb prospective VHS graduates necessitates competencies that did not previously exist. Some jobs require VHS student graduates to master technology, while others undergo changes and disappear from the industrial world.

In light of the aforementioned phenomenon, the Indonesian government has taken immediate precautions, including issuing Presidential Instruction Number 9 of 2016 on VHS Revitalization [5]. This program includes ten concrete steps for achieving superior human resources. The ten revitalization steps are as follows: Revitalizing human resources, constructing a School Administration System (SAS) based on Management Information Systems (MIS), Link and match with industry, Industry-based curriculum, Teaching Factory, Use of video tutorial media and e-report video-based portfolios skills, Professional Certificate Test, Facility and infrastructure fulfillment Developing local wisdom, The role of VHS as a local economic driver [5]. The Indonesian government also announced a new policy to strengthen VHS vocational education. The existence of the New Teaching Factory program is the policy. New TeFa 2021 is a vocational assistance program designed for schools that are ready to develop products that meet industry quality standards. Furthermore, the program allows VHSs to receive assistance from knowledgeable industrial partners [6].

The Teaching Factory (TeFa) learning model represents a significant step toward VHS revitalization. This learning model teaches students theory and skills by involving the Business World/Industry World (DuDi) so that they achieve basic DuDi competencies and have an entrepreneurial character. One of Prosser's [7] concepts that is still relevant and widely used in vocational education in Indonesia is that learning effectiveness can be achieved if the environment in which students are trained is a replica of the environment in which they will work later. As a result, the idea for VHS to collaborate closely with the business and industrial worlds emerged. Several steps and breakthroughs were made, including industrial apprenticeships, industrial work practices, the creation of production units, and the implementation of the Teaching Factory learning model. Since the introduction of the industry-based VHS development model in 2005, several VHSs have been able to carry out TeFa learning, but there have also been quite a few VHSs that have tried but stopped halfway until now.

Germany is an example of a developed country with a well-established vocational education system. In Germany, the vocational education system follows a well-established dual system that includes Teaching Factory. This is in contrast to Indonesia's vocational school education system, which, in general, continues to fall short of the match between schools and the industrial world. Many of them are VHS graduates who have not been immersed in the worlds of business and industry. As a result, the perspectives of education experts in Indonesia remain relevant. According to this viewpoint, the Indonesian education system must be self-developed following the socio-cultural conditions or life of the Indonesian nation [8], [9].

Teaching Factory learning, which was pioneered by Sema Alptekin at Cal Poly State University in the United States in 2001, aims to make it easier for students to obtain internships or work placements [10]. According to the findings of this study, students can not only gain theoretical and practical knowledge at school workshops but also apply knowledge and hone skills outside of school through TeFa. When applied to VHS, TeFa learning can help students experience learning related to the world of work or work-related learning, as well as work-based learning while studying at VHS.

This case study was conducted on VHS, which successfully implemented a Teaching Factory and has become an Indonesian national reference. The "case" here refers to the gap or discrepancy to be discovered. These are the cases: The Teaching Factory learning model has been successfully implemented in several VHSs in Indonesia. However, many VHS who attempted to implement this learning model ran into difficulties and had to abandon their efforts. As a result, a further and in-depth research is required at a VHS

with a good reputation for producing superior graduates by implementing the Teaching Factory learning model. One of the VHSs in Surakarta was chosen as a case in this study because it successfully implemented the Teaching Factory learning model.

The Teaching Factory learning model is effective in improving students' cognitive, affective, and psychomotor abilities in VHS. As a result, graduates of these two VHSs are completely absorbed to meet the needs of the industrial world and continue their studies. The VHS also generates products or outputs that are marketable. Some of the phenomena mentioned above are indicators of the Teaching Factory learning model's successful implementation in VHS. This is consistent with previous experts' opinions that the conceptual approach to the Teaching Factory learning model, teaching modules, and learning activity processes that meet industry requirements can be realized in learning. As a result, it can improve applied competence in real-world situations [11]. Another viewpoint holds that by implementing the Teaching Factory learning model, students gain the knowledge and skills required to perform work successfully and effectively [12]. The Teaching Factory learning model can also help students master entrepreneurship competencies and skills [13].

Even though it does not have a TeFa center, VHS in Surakarta has consistently used the Teaching Factory learning model in the field of industrial machinery and tools. All aspects of the school are involved and believe that the school is a model of the working world. As a result, the work culture ethic is emphasized from the moment you enter school. While the curriculum and equipment facilities are designed to meet the needs of the business world, they also meet the specifications of real engine and automotive companies. Several companies that employ VHS graduates regard their graduates as very good. These VHS graduates have mastered competencies and are ready to enter the workforce. As a result, graduates from VHS Surakarta are eagerly awaiting recruitment and invitations from national and international companies. VHS graduates in Surakarta are also completely integrated into the industry, with some continuing their education. VHS in Surakarta is now considered capable of producing products with the high quality and selling value required by consumers thanks to the implementation of TeFa. Aside from developing the potential of VHS graduates, it can also be a source of income to support the growth of school operations.

The success of VHS is inextricably linked to the implementation of the Teaching Factory learning model. Researchers want to dig deeper into this VHS, which represents schools that have also successfully implemented the Teaching Factory learning model at VHS. By reviewing existing studies, theories, and facts, it will be able to conclude case studies and present new

or novel findings on the key factors for the successful implementation of the Teaching Factory learning model. The findings of this study can also be used to inform the implementation of the Teaching Factory learning model in all VHSs in Indonesia.

2. LITERATURE REVIEW

2.1. Vocational Education

Evans defines vocational education as a component of an educational system that aims to prepare students to be more capable of working in a specific group of jobs or one field of work than in other fields of work [14]. Evans' viewpoint emphasizes the importance of vocational education in preparing graduates for specific fields of work.

This means that vocational education must also develop students' physical skills, intellectual abilities, moral values, and personalities. Furthermore, if vocational education only develops physical aspects in the form of skills, he will only stop being a machine and lose his human aspect when he becomes a worker. Thus, the purpose of vocational education should include aspects of morals and personality, so that when vocational school graduates graduate, they can work with good and moral personalities.

Legislation governing vocational schools has evolved over time. Observing the evolution of legislation concerning vocational schools, Law No. 2 of 1989 states that vocational education has legally entered the National Education System, namely the type of education included in the school education pathway (Article 11, Paragraph 1). Furthermore, it is stated in paragraph 3 that "vocational education is education that prepares students to work in specific fields"[15].

Article 1 paragraph 3 of Government Regulation No. 29 of 1990 defines vocational education as "education at the secondary education level that prioritizes the development of students' abilities to carry out certain types of work." Article 3 paragraph 2 states that "vocational secondary education prioritizes preparing students for employment and developing a professional attitude." Some of these laws share the common core of vocational education at the secondary level, which aims to prepare students for specific jobs [16].

The current education law is Law Number 20 of 2003 Concerning the National Education System. Secondary education is defined as a continuation of basic education in Chapter VI article 18 paragraphs 1, 2, and 3. It consists of senior secondary education (SMA) and vocational secondary education (SMK, MAK, or other equivalent forms) (Government of Indonesia, 2003). As a result, the Vocational High School (SMK) is a secondary education school path [1].

2.2. Vocational Education in Indonesia

The first vocational school equivalent to a university, the shipping academy, was established in Indonesia in 1737 during the reign of the Dutch Vereenigde Oostindische Compagnie (VOC). The school, however, was closed in 1755. Around 1853, after more than two centuries of power, the Dutch reopened vocational schools in Indonesia. Ambachts School van Soerabaja or Surabaya Carpentry School is a vocational school for Indonesian and Dutch children.

Because everything Dutch had to be removed during the Japanese colonial period, Indonesia had to rebuild education from the ground up. At the time, the carpentry school, namely the vocational education Middle School (STM) in Bandung's Ciroyom district, was reopened. The school was open for three years during the Japanese era and had 360 students.

Since the implementation of the Five-Year Development Plan (Repelita) in 1969, vocational education in Indonesia has been revived. Vocational education forms began to adopt appropriate models from other countries, and vocational education gradually gained a place in the Indonesian education system. The milestone for the development of integrated vocational education in Indonesia began in Repelita V, with the enactment of Law No. 2 of 1989 concerning the National Education System, followed by the enactment of PP No. 29 of 1990 concerning Secondary Education, which contains several provisions for the development of vocational education.

During this period, the development of production units as part of the learning process in SMKs was also started through Kepmendikbud No. 490/1992 concerning Vocational High Schools; the activities of this production unit included activities to produce goods and services by utilizing all available resources in schools and their environment. The government implemented additional development policies, such as the Dual System Education (PSG) through the Link and Match concept, beginning in 1997 (Kepmen No. 323/U/1997), which marked the beginning of efforts to involve the business/industry world in vocational education [17]. By making some modifications, this system adopts the Dual System model used in Germany. In theory, PSG is an educational system that is thought to be ideal for increasing the relevance and efficiency of SMK. This implementation activity includes student practice in the industry. Vocational Schools have engaged the business/industry world in a variety of ways, including holding vocational education festivals, signing school cooperation agreements with the business/industry world, establishing internal organizations in schools, and regular visits by teachers to the business/industry world. Following this effort, the National Vocational Education Council (MPKN) and

the Provincial Vocational Education Council were formed. According to Article 15 of Law 20/2003 Concerning the National Education System, the existence of SMK is intended to prepare graduates to work in specific fields. This demonstrates that vocational education is designed to prepare graduates to work, either independently or in specific industries.

Vocational education in Indonesia then enters a new and challenging era. The government issued Presidential Instruction Number 9 of 2016 on Vocational High School Revitalization, which was followed by a memorandum of understanding between relevant ministries to encourage the development of vocational education [5]. This revitalization is expected to be able to anticipate the development of technology 4.0 and the destructive nature that it entails, so vocational education must be prepared to deal with it. The following goal is to develop regional potential advantages in Indonesia as a national advantage in order to create national competitiveness. Human Resources, SAS/SIM, Link and Match with the Business World and the Industrial World, Curriculum, Teaching Factory, eReport Skill, Certification Test, Infrastructure Facilities, Local Wisdom, and Economic Collaboration are the areas of focus for Vocational Revitalization Steps.

2.3. Learning Model in Vocational Education

In the context of vocational education, learning models refer to the approaches or strategies used to facilitate the acquisition of skills, knowledge, and competencies that are relevant to a specific trade, profession, or occupation. Vocational education, also known as career and technical education (CTE), is focused on preparing individuals for employment in specific industries or occupations, and learning models used in this context are tailored to meet the unique needs of vocational learners.

There are several different learning models that can be applied in vocational education, depending on the goals, objectives, and characteristics of the learners. Some common learning models used in vocational education include: Competency-based learning, Apprenticeship or on-the-job training, Blended learning, Project-based learning, Work-based learning, Teaching Factory and else.

2.4. Teaching Factory Learning Model

Sema Alptekin introduced this learning model to Cal Poly State in 2001. The Teaching Factory concept is to replicate small-scale manufacturing factories in order to educate students effectively and in accordance with real-world business conditions [10]. The Teaching Factory learning model is highly recommended for use in Vocational High Schools because it can improve graduates' job readiness [18]. This learning model's

implementation can be tailored to the conditions and learning resources available in each SMK.

This learning model is also used in vocational high schools to prepare SMK graduates to become workers and/or entrepreneurs, and it can assist students in choosing work fields based on their competencies. Students' creativity can also be enhanced by learning by doing and developing the skills required by the workplace. Another advantage of this model is that it broadens the range of recruitment opportunities for SMK graduates while also assisting students in preparing to enter the workforce. In addition to establishing collaboration with the real world of work. This model is also thought to be capable of providing students with the opportunity to practice their skills so that they can make decisions about which career to pursue.

3. METHOD

A qualitative research model with a case study design is used in this study. The research site is a VHS in Surakarta, Central Java, where the Teaching Factory learning model has been successfully implemented. This study took approximately eight months to complete. Researchers use the Purposive sampling technique to select key informants. Data sources and key informants in this study included the school principal, former principal, TEFA coordinator, teacher, and a student in grades X, XI, and XII. This is illustrated in the table below.

Table 1. Research informant data.

No	Infor mant	Position	long time working (year)	old school (year)
1	MAR	School principal	26-30	-
2	MU	Former principal	26-30	-
3	FE	TEFA coordinator	16-20	-
4	HA	Teacher	11-15	-
5	ARF	A student in grades X	-	0-1
6	MAT	A student in grades XI	-	1-2
7	TH	A student in grades XII	-	2-3

This study's data collection techniques included in-depth interviews, observation, and documentation at VHS. Researchers used assistive instruments such as research protocols, observation sheets, cameras, and audio and video recording devices to conduct this study. In this study, the credibility test was carried out using the following methods: source triangulation (cross-checking the data obtained from several informants), technical triangulation (cross-checking interview,

observation, and documentation data), and member checks (checking the suitability of the data obtained by the researcher and given by the informant). Iterative data processing employs Miles and Huberman data analysis techniques.

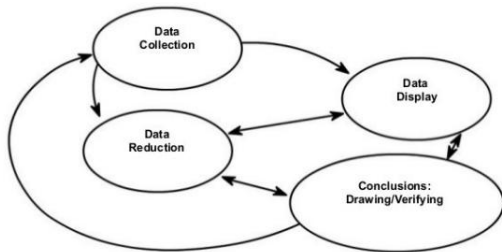


Figure 2. Iterative data processing [19].

The Nvivo 12 Plus software (QSR) was used by the researchers to help organize qualitative data. The use of this software will assist researchers in displaying and visualizing data interpretations. Another application is to reduce researcher subjectivity.

4. FINDING AND DISCUSSION

The findings obtained by the researchers are the key factors that determine the successful implementation of the teaching factory learning model in VHS Indonesia. The researchers discovered several success factors in one of the VHS in Surakarta based on in-depth interview data, observation, and documentation.

Discipline is a key success factor. The researcher discovered that the first factor is the most dominant. The following information was provided by informant HA, a teacher with 15 years of experience at a VHS in Surakarta:

"During the orientation period for the school environment (MPLS), students were learned that discipline is a VHS characteristic that will be maintained. Because that is the only competitive edge VHS has over the other schools." (HA/21-01-2022)

Another success factor that the researchers discovered in one of the VHSs in Surakarta was the students' passion or motivation. Students are expected to be passionate and to be capable of developing that passion while learning. As the TeFa coordinator, the FE informant provided the following information:

"Yes, if you don't have passion, you should transfer to another school. Numerous different schools do not implement drop out prevention programs comparable to this one." (FE/16-08-2021)

The MAR informant, who is also the school principal, confirmed and expanded on this viewpoint. That one of the VHS in Surakarta instills two core values in their students, namely discipline and honesty. This was mentioned in the interview in the following way:

"It did work. Then there's honesty, which is another core value we instill in our children. Disciplined and honest." (MAR/22-02-2022)

Another important success factor is the alignment of schools with the worlds of business and industry. This was revealed by an informant HA, who worked as a teacher at a VHS in Surakarta, as follows:

"The product itself then facilitates learning. It is integrated into the school's curriculum, then into teaching materials, and finally into products that can be sold, with the results supporting the learning process itself." (HA/21-01-2022)

The attitude of always innovating or innovation comes next. This was revealed by the informant MAR, the Principal of one of Surakarta's VHS schools, as follows:

"That was our internal understanding to always innovate." Internally, the government is currently recommending a triple helix. VHS, Vocational Higher Education, and Industry Collaboration." (MAR/22-02-2022)

Several factors contribute to the success of a VHS in Surakarta in implementing the Teaching Factory learning model. Discipline was the main factor that was successfully revealed. The main factors underlying the successful implementation of this learning model are practice discipline, processing time, and order delivery. The VHS believes that the disciplinary factor is critical and that it is the primary property of the VHS in the implementation of learning. Discipline is another legacy of the VHS that will be preserved and maintained throughout the ages.

The second critical success factor is students' passion or motivation. The school first noticed the students' passion during the initial selection of new students. Then, develop the ability to see students' passions and motivate them in the implementation of learning. In class X and class XI, a thorough evaluation of the passion of the students was carried out. The school does not know compromise if there are students who decrease or even change their passion. Because it will impede student learning outcomes as well as school-based learning programs. As a result, the success of implementing learning in schools in general is determined by passion.

The third factor is innovation, which involves all stakeholders. Cooperation between VHS Vocational Higher Education and Industry, also known as the triple helix, is a collaboration that will produce innovation in the field of learning, as manifested in student product manufacturing. As a result, VHS recognizes the significance of innovation in the implementation of this learning model.

The fourth factor is honesty. In VHS, which has successfully implemented the Teaching Factory learning model, honesty is a core value that is upheld and even becomes the school's slogan.

The fifth factor is the synchronization of educational institutions with the business and industrial worlds. The successful synchronization of curricula by schools based on industry needs can support school success in producing graduates required by the business and industrial world.

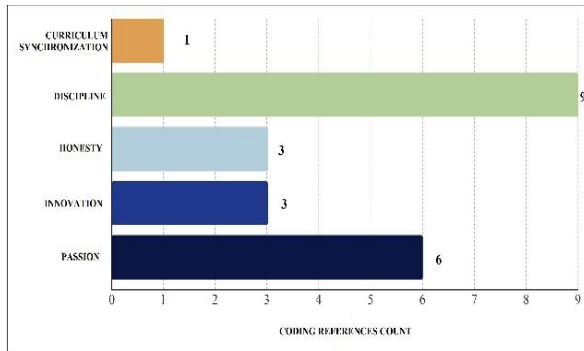


Figure 3. The key to a successful Teaching Factory learning model implementation.

This is supported by previous research findings, specifically those of Sulistyono [20], who examines indicators of competency test results and the feasibility of student-produced products. According to the findings of this study, the Teaching Factory learning model has a significant effect on student competence when compared to students treated with a training-based learning model.

Previous research from Wahjusaputri [21] on the implementation of the Teaching Factory Learning model with 27 critical success factors strengthens the findings of this practical study. The study also classified 27 critical success factor items into three categories. These primary factors include the business and industrial worlds, schools and teachers, and students.

5. CONCLUSION

The findings revealed that discipline, passion or motivation, innovation, honesty, and curriculum synchronization were the determinants of VHS's success in implementing the Teaching Factory learning model.

AUTHORS' CONTRIBUTIONS

Isnantyo F D: Conceptualization, Methodology, Investigation, Formal analysis, Supervision, Project administration, Writing-original draft.

Pardjono: Supervision, Writing-review & editing.

Triyono M B: Supervision, Writing-review & editing.

Wijarwanto F: Conceptualization, Supervision, Writing-review & editing.

Moersid D: Conceptualization, Supervision, Writing-review & editing.

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