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Teaching Factory-Based Field Work Practice Learning Model to Improve Vocational High School Students' Competencies

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Abstract

This research aimed to develop a valid and practical Teaching Factory-based Field Work Practice learning model to improve the competency of Vocational High School students. This research is motivated by the suboptimal implementation of Field Work Practice, which is still lacking in structure, measurement, and is not fully aligned with industry standards. This research used a Research and Development (R&D) approach with the ADDIE development model, which includes analysis, design, development, implementation, and evaluation. The research instruments consisted of an expert validation sheet and a teacher practicality questionnaire with a five-level scale. The validation subjects involved five experts, while the practicality test was conducted by five teachers teaching the Field Work Practice subject. The results showed that the TeFa-based Field Work Practice learning model achieved a validity level of 93.15%, categorized as very valid, and a practicality level of 90.8%, categorized as very practical. These results indicate that the developed model has high design quality, is easy to implement, and is relevant to the needs of industry-based learning. The implication of this research is that the Teaching Factory-based Field Work Practice model can be used as a strategic alternative in implementing Field Work Practice in vocational schools, especially in overcoming limited industrial access, as well as contributing to improving student competencies through authentic, structured, and work-oriented learning experiences.

Keywords: Teaching Factory, Competence, Learning Model

INTRODUCTION

Field Work Practice is an essential component of vocational education, serving as a learning platform based on real-world work experience. Through Field Work Practice, Vocational High School students are expected to not only master technical competencies but also internalize work culture, professional ethics, and adaptive readiness to face the dynamics of the working world. Thus, Field Work Practice is no longer viewed simply as a practical activity, but rather as a structured, measurable, and competency-oriented learning process.

Along with the implementation of the new paradigm in the Independent Curriculum, a fundamental shift has occurred in the position of internships. Previously viewed as an out-of-school practical program, Field Work Practice is now recognized as part of a subject with a clear learning structure, measurable learning outcomes, and a systematic evaluation mechanism. This change requires a learning model that ensures that students' work experiences remain meaningful, even if not entirely in the workplace.

In practice, the implementation of internships still faces various challenges, particularly related to the limited absorption capacity of the Business, Industry, and Workforce sector. The imbalance between student numbers and industry capacity means that not all students gain work experience relevant to their skill competencies. Furthermore, limited time for mentoring in industry and the suboptimal partnership between schools and Business, Industry, and

Workforce sector result in students' learning experiences being partial, unstructured, and difficult to measure.

In this context, the Teaching Factory (TeFa) has undergone a significant conceptual transformation. Previously known as a government program focused on production units in schools, TeFa has been positioned as an industry-based learning model that integrates real-world business processes into learning activities. TeFa functions not only as a production facility but also as a learning environment that implements industry operational standards, a professional work culture, and a performance-based evaluation system.

As a learning model, the Teaching Factory has characteristics that enable integration between school learning and workplace practice, thus potentially becoming a solution for implementing internships in a new paradigm. Through this approach, students can gain structured, sustainable, and industry-standard work experience, both within the school environment and through collaboration with industry partners.

However, existing studies still show research gaps. Most previous research still positions Teaching Factory as a general learning program or approach in vocational schools, and has not specifically integrated it as a learning model in the fieldwork subject. Furthermore, there is limited research developing a Teaching Factory-based model that is systematically designed, validated by experts, and tested for practicality by direct users in schools.

Based on this gap, it is necessary to develop a Teaching Factory-based Field Work Practice learning model that is not only able to address the limited access to Field Work Practice in the world of work, but also ensures that the learning process continues to be structured, measurable, and relevant to industry needs.

Specifically, this research aims to: 1) Developing a Field Work Practice learning model based on Teaching Factory (TeFa), 2) Analyzing the level of validity of the model based on expert assessments, 3) Analyzing the level of practicality of the model based on teacher assessments.

Thus, this research is expected to contribute to the development of vocational learning models that are adaptive to the new curriculum paradigm, and can strengthen the quality of the implementation of Field Work Practice as a subject oriented towards the world of work.

METHOD

This study used the *Research and Development* (R&D) method by adopting the ADDIE development model, which includes the stages of analysis, design, development, implementation, and evaluation. The ADDIE model was chosen because it provides a systematic and sustainable framework for developing learning products, making it suitable for

designing a Teaching Factory (TeFa)-based Field Work Practice (Field Work Practice) learning model .

The research was conducted at a Vocational High School (SMK) in Banten Province with an Electrical Engineering Expertise Program that has implemented the Teaching Factory approach in learning. The location was selected purposively by considering the expertise program, the school's readiness to implement TeFa-based Field Work Practice, and the availability of teachers with experience in implementing Field Work Practice.

The research subjects consisted of two groups: expert validators and Field Work Practice subject teachers. The five expert validators were selected based on their expertise in learning technology, Teaching Factory (materials), learning evaluation, industry practice, and learning media. Furthermore, the validators had at least five years of professional experience and an understanding of the context of vocational education. Meanwhile, the practicality test subjects consisted of five Field Work Practice subject teachers selected based on their minimum three years of teaching experience and active involvement in Field Work Practice implementation at school.

The approach used in this research was development with a limited trial *that* was descriptive-evaluative in nature. This approach did not aim to compare effectiveness through experiments, but rather to assess the quality of the product being developed in terms of validity and practicality before wider implementation.

Research data were collected using two types of instruments: an expert validation sheet and a teacher practicality questionnaire. The validation sheet was used to assess the model's feasibility based on its theoretical foundation, rationale and objectives, structure and components, suitability to the Field Work Practice–TeFa context, and potential impact. The practicality questionnaire was used to assess the model's ease of use, implementation, acceptability, support for a production culture, and initial effectiveness. All instruments used a five-level Likert scale.

Data analysis was conducted using quantitative and qualitative approaches. Quantitative data were analyzed using percentage techniques by comparing the scores obtained to the maximum score, then converted into assessment categories, namely very valid/practical, valid/practical, sufficient, less, and not feasible. Meanwhile, qualitative data were obtained from comments, suggestions, and input provided by expert validators and teachers during the practicality test, including the results of observations during limited implementation. Qualitative data analysis was carried out through data reduction stages by grouping input based on themes, presenting data in the form of descriptive narratives, and drawing

conclusions that were used as a basis for revising and refining the model at each stage of development.

The model development phase begins with an analysis phase aimed at identifying issues in the implementation of internships in vocational schools, particularly those related to limited access to the Business, Industry, and Work World, mismatches between work fields and student competencies, and limited guidance from industry. The results of this analysis serve as the basis for formulating model development needs.

The design phase involves developing a TeFa-based Field Work Practice learning model structure, encompassing the learning flow, competency components, standard operating procedures, and learning tools such as modules, essential material mapping, and Learning Implementation Plans. The development phase involves producing products in the form of conceptual models, Field Work Practice modules, and Teaching Factory-based teaching tools. Expert validation is also conducted at this stage, and the results are used to revise the model.

The implementation phase was limited to selected classes to assess the model's feasibility in a real-world learning context. During implementation, observations were conducted to identify model suitability and any emerging obstacles. The evaluation phase was conducted both formatively and summarily to assess the model's overall validity and practicality. The results of this evaluation were used to make final revisions to achieve a Teaching Factory-based Field Work Practice learning model that was feasible, practical, and ready for implementation.

RESULTS AND DISCUSSION

Model Validation Results

Validation results of the Field Work Practice learning model based on Teaching Factory were obtained through assessment of five expert validators. Evaluation covers aspect runway theoretical , rational and objective of the model, structure and components of the model, suitability with Field Work Practice–TeFa context, as well as potential model impact.

Assessment results show that the model developed get average value of 93% with very valid category. In detailed , aspects runway theoretical get value 93%, rationale and objectives of the model 92 %, structure and components of the model 94 %, suitability with Field Work Practice–TeFa context of 93%, as well as potential the impact of the model is 93%, as presented in Table 1 using Table 2 as Interpretation Category.

Table 1. Quantitative Data of Expert Model Validation Results

No.	Aspect	Percentage	Category	Decision
1	Foundation Theoretical Model	93	Very Valid	Very decent model used without revision
2	Rationale and Purpose of the Model	92	Very Valid	Very decent model used without revision
3	Model Structure and Components	94	Very Valid	Very decent model used without revision
4	Compliance with Field Work Practice–TeFa Context	93	Very Valid	Very decent model used without revision
5	Potential Impact of Model	93	Very Valid	Very decent model used without revision
	Average	93		

Table 2. Interpretation Category

	Category
85–100%	Very Worthy
70–84%	Worthy
55–69%	Quite Decent
40–54%	Less than worthy
< 40%	Not feasible

High validity value show that the model has suitability strong conceptual, good from side theory and implementation. Consistency mark between aspects (range 92%–94%) indicate that the model has stable and unsteady structure there is weakness significant on components certain.

Practicality Test Results

Practicality test conducted by five subject teachers Field Work Practice lessons to assess ease and implementability of the model in learning. Analysis results show that the model obtains average value of 91.6% with very practical category. In detailed aspects, convenience get value 90%, implementation 92%, acceptance 93%, support to culture production 93%, as well as effectiveness beginning by 90%. As shown in Table 3 using Table 4 as Interpretation Category.

Table 3 . Quantitative Data of Model Practicality Test Results

No	Aspect Evaluation	Percentage (%)	Category
1	Convenience	90	Very Practical
2	Implementation	92	Very Practical
3	Acceptability	93	Very Practical
4	Support to Culture Production	93	Very Practical
5	Initial Effectiveness	90	Very Practical
	Average	91.6	Very Practical

Table 4. Interpretation Category

	Category interpretation
85–100%	Very Practical
70–84%	Practical
55–69%	Enough Practical
40–54%	Less practical
< 40%	Impractical

High practical value show that the model does not only worthy in a way theoretical, but also easy implemented by teachers. The height mark effectiveness early (90%) indicates that the model is capable give impact direct towards the learning process.

Analysis Results Qualitative

Quantitative data, the results research is also supported by analysis qualitative data obtained from validator and teacher input.

Analysis results show a number of findings main, namely:

1. Models are assessed own channel clear and systematic learning
2. Business process integration in learning assessed relevant with need industry
3. Need improvements in aspects technical implementation, especially in the guidelines operational

Findings This show that the model does not only valid in numbers, but also accepted in a way conceptual by users.

Research result show that the Field Work Practice learning model based on Teaching Factory has level very high validity and practicality. Findings This strengthen that integration Teaching Factory approach in eye Field Work Practice lessons are relevant solutions in answer challenge limitations access industry.

In a way theoretical, results This in line with draft learning based experience (*experiential learning)* and learning based work (*work-based learning*), which emphasizes importance involvement direct student in context Work real . Teaching Factory in study This functioning as bridge between school learning and practice industry.

From the side practical, this model give implications that school can optimize implementation of Field Work Practice without fully depends on the availability of Business, Industry, and Workforce sector. This is very important in context improvement amount vocational school students who do not comparable with capacity industry .

However Thus , research This own limitations. First, the number of subject study Still limited, namely only involving five validators and five teachers, so that the generalization

results Still need tested further. Second, the implementation of the model is still done on a scale limited, so not yet describe effectiveness in term long.

Therefore that, research furthermore recommended for:

1. Test effectiveness of the model through design experiment
2. Involving amount larger subject
3. Implementing the model on various field skill

CONCLUSION

This research produces a Teaching Factory-based Field Work Practice (Field Work Practice) learning model (Field Work Practice-TeFa) designed to address various obstacles in implementing Field Work Practice in vocational schools, such as limited industrial capacity, incompatibility of practice areas, and less than optimal mentoring during Field Work Practice activities. The Field Work Practice-TeFa model offers a flexible and adaptive learning approach, allowing Field Work Practice implementation to be carried out in the industrial world or in school production units (Teaching Factories) without reducing the quality of students' work experience.

The model developed through the ADDIE stages includes a conceptual framework, operational procedures, learning modules, mapping of essential materials, and learning tools. Expert validation results indicate that this model meets the feasibility aspects in terms of substance, design, conformity to industry standards, and relevance to the work competency needs of vocational high school students. Practicality tests by teachers indicate that the Field Work Practice-TeFa model is easy to understand, easy to implement, and supports production-based learning processes in vocational high schools.

Theoretically, the Field Work Practice-TeFa model aligns with the principles of *work-based learning* , which emphasize the importance of authentic experiences in developing work competencies. The model's consistency with the characteristics of vocational learning suggests that Teaching Factory can be an effective solution to overcome obstacles to Field Work Practice implementation while simultaneously improving students' work readiness. Therefore, it can be concluded that the Field Work Practice-TeFa model developed in this study is valid, practical, and suitable for use as an alternative model for Field Work Practice implementation in vocational high schools.

SUGGESTIONS

Based on the results of research and development, there are several recommendations that can be given to related parties, namely as follows.

1. For Schools (Vocational Schools)

The Field Work Practice-TeFa model needs to be implemented in stages, taking into account production unit readiness, equipment availability, and partnership governance with industry. Schools need to ensure that production units adhere to industry-standard procedures to ensure authentic and high-quality student learning experiences.

2. For Field Work Practice Subject Teachers

Teachers are advised to use this model as a guideline for designing structured, measurable, and experience-based internship learning. Teachers need to strengthen their competencies in creating business process-based learning modules and reflecting on learning to enhance the meaningfulness of student experiences.

3. For the World of Business and Industry (Business, Industry, and Workforce sector)

This model can serve as the basis for more flexible collaboration between vocational schools and industry. Industry can contribute to validating work standards, providing technical training, and supervising school-run production units.

4. For Further Researchers

This research has produced a valid and practical model, but its effectiveness in improving student competency has not been tested at this stage. Therefore, further research needs to implement an effectiveness test using an experimental design to determine the impact of the Field Work Practice-TeFa model on improving student work competency.

5. For Policy Makers

The Ministry and Department of Education can consider the Field Work Practice-TeFa model as an alternative policy for implementing Field Work Practice, especially in regions with limited industrial partners. Regulatory and funding support are essential to strengthen the capacity of Teaching Factories in vocational schools.

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