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Implementation of the Six-Step Teaching Factory Learning Model (TF-6M) at Vocational High School

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ABSTRACT
Vocational High School (SMK) actually prepares its graduates to be able to work according to their competency skills. Regarding the many problems within the scope of implementing education in SMK, the focus of this research is limited to two main issues, namely: (1) increasing learning innovation and (2) fulfilling the improvement of the professional quality of teachers. One of the recommended learning models is the concept development of the teaching factory learning model with six steps (model TF-6M). The process of implementing TF-6M is in line with the development of competency standards and teacher entrepreneurship thinking with an impact on: (1) achieving student vocational competency standards, (2) developing students' entrepreneurial spirit, and (3) having an information technology-based entrepreneurship craft program. The implementation of the TF-6M model is carried out by applying classroom action research to productive learning. The findings show an increase in teachers' professional abilities, self-development in producing scientific works and the acquisition of meaningful learning for SMK students.

Keywords: *Learning, Teaching factory, Vocational High School.*

1. INTRODUCTION

Presidential Instruction No. 9 of 2016 concerning Revitalization of Vocational High Schools aims to increase the competitiveness of Indonesia's human resources which then becomes a reference for the Ministry of Education and Culture through the Directorate of Vocational High School Development to implement SMK revitalization programs throughout Indonesia. The revitalization of SMKs is carried out in stages by taking into account the potential of the region, resources and the real need for manpower to support economic development and regional development. The revitalization of SMKs is expected to have a positive impact on improving the quality of SMKs as well as having an impact on the quality of SMK graduates who will become development resources in Indonesia.

The results of identification of SMK problems as the basis for SMK revitalization program activities include: (1) Development and Alignment of Curriculum, (2) Standardization of Main Facilities and Infrastructure, (3) Quality Improvement (Innovation) of Learning, (4) Fulfillment and Improvement of the Professional Quality of Teachers and Tendik , (5) Increasing the Quality of Cooperation with DUDI, and (6) Improving School Governance. Furthermore, in this community service activity the focus of the problem is limited to two real problems, namely: (1) Improving the Quality (Innovation) of Learning and (2) Fulfillment and Improvement of the Professional Quality of Teachers and Technician Laboratory.

In order to support policies, particularly regarding teaching factories, one of the six-step teaching factory learning models (model TF-6M) can be used as a means of improving the quality of learning in Vocational Schools and developing interpreters. The TF-6M implementation process will simultaneously foster teachers in developing competency standard abilities and developing an entrepreneurial mindset in accordance with implementing this model, it will: (1) achieve student vocational competency standards, (2) develop students' entrepreneurial spirit, and (3) have a program entrepreneurship-based craft. The results of research conducted by Kautsar [1] state that the teaching factory

model is very feasible to implement in vocational high schools. Meanwhile, Hasanah also stated that the implementation of a teaching factory based on the entrepreneurial model is valid and effective for use in vocational high schools [2].

In addition, there will be a revitalization of the teacher's professionalism when implementing the TF-6M model, the teacher develops a classroom action research model based on the implementation of the TF-6M model. Thus, for teachers who are involved in implementing the TF-6M learning model and developing classroom action research based on this model, the teacher will benefit from increased professional skills as well as increased ability to produce scientific work.

1.1. Problems

The role of a teacher is very important to make students face competition in the world of work and make them graduates who are successful in dealing with competence or learning mastery. To achieve this, a strategy is needed for teachers so that students can learn effectively and efficiently. The old pattern of classical learning as practiced by many teachers until now is not the right strategy to be applied to the learning process anymore. If the pattern is still applied then students will feel bored, there is no enthusiasm to receive lessons. As a result, it will not foster students' interests, talents, potential or creativity.

Teachers need to present interesting and fun learning for students, aiming to fulfill a teacher's competence and professionalism in teaching. Presentation and learning techniques are knowledge about teaching methods that are controlled by the teacher to carry out learning activities or present lesson material to students in the classroom, so that these lessons can be captured, understood, understood and used by students properly. everything must be adjusted to the indicators to be achieved in the learning, as well as the time needed to achieve its completeness.

The main key to teacher success in teaching is choosing the right strategies, models and methods supported by teaching techniques and tactics. What is meant by a learning strategy is a plan that contains a series of activities designed or designed by the teacher to achieve learning objectives. This includes the use of methods and utilization of various sources or learning media in teaching and learning activities in the classroom. Thus, the preparation of learning steps, the use of various media and learning resources, are all directed at achieving learning objectives.

1.2. Expected Results

The implementation of the TF-6M model in Vocational Schools through classroom action research aims to develop productive Vocational School teachers in:

a. planning the learning of the TF-6M model in schools through making a Learning Implementation Plan and TF-6M flow;
b. implementing the TF-6M learning model in schools in productive subject groups with an emphasis on product and service services;
c. carry out an evaluation of the TF-6M model learning program through the stages of classroom action research; And
d. compiling scientific work based on the results of classroom action research that has been implemented

2. LITERATURE REVIEW

2.1. Concept of Teaching Factory

Learning innovation through teaching factories is one of the many vocational revitalization programs. The implementation of teaching factories in SMKs needs to get priority from school management (SMK) so that this program can be implemented properly to realize the goal of revitalizing SMKs launched by the President through Presidential Instruction Number 9 of 2016, namely Improving the Quality and Competitiveness of Indonesian Human Resources (HR).

Many educational institutions strive to bring educational practices close to industry. So the teaching factory has become a new approach to vocational education with the aim of:

a. modernizing the teaching process by bringing closely to industry practice;
b. leverage industry knowledge through new knowledge;
c. support the transition from manual to automated ways of working and reduce the gap between industrial resources (workers and capital) and industry knowledge (information).

The basic conception of the teaching factory is "Factory to Classroom" which aims to transfer the real industrial production environment into practice spaces. Real production life is urgently needed to improve teaching competencies based on real activities from industrial practice every day.

In Indonesia, the application of the teaching factory concept was introduced in SMKs in 2000 in a very simple form, namely in the form of developing production units that had been implemented in SMKs. Then the concept developed in 2005 to become an industrial-based SMK development model.

Then, at the beginning of 2011, the development of SMKs was carried out with a third model, namely the development of industrial-based SMKs which developed

in the form of factories as places of learning, hereinafter known as teaching factories. Factory here is just a term and does not mean factory, but in the form of learning it is carried out directly at the practice site not in the classroom, and the practice is oriented towards production as in real industry. The implementation of this model fully integrates learning and work, no longer separates between the delivery of theory and practice.

Initially the teaching factory concept adapted from the dual system learning method which has long been applied in TVET education in Germany and Switzerland. This learning method is a method that integrates the two main environments in each student's activities, namely the school environment and the industrial environment. Students do not only carry out learning activities at school, but also practice and work in the industry for a relatively long period of time. This makes students able to acquire skills, processes and attitudes that are in accordance with industry standards so that educational outcomes are in accordance with industry needs.

The teaching factory program is a combination of existing learning, namely Competency Based Education and Training (CBET) and Production Based Education and Training (PBET). In the sense that a process of expertise or skills (life skills) is designed and implemented based on actual work procedures and standards (Standard Operation Procedures) to produce products that are in line with market/consumer demands.

2.2. Implementation Strategy

The application of the teaching factory concept requires a systematic framework so that it can work according to the needs of the world of education and industry. The framework aims to direct SMK to the stages that will be passed according to the structure of the teaching factory implementation procedure. This framework is a strategy that involves the relationship between elements in the learning system in SMK which basically always refers to the national curriculum that applies in Indonesia. Teaching factory is a learning method, so the implementation strategy designed is a strategy related to the process of learning activities that involves all elements of the school.

The availability of a curriculum or syllabus helps SMKs in preparing Learning Program Plans (RPP) and teaching materials. However, to prepare an RPP for an expertise program or competency skills, the SMK must at least be able to identify the needs of the expertise program and the resources it already has. One of the methods that has been applied is the identification process that starts the preparation of the RPP is the determination of the system schedule. It is intended that the preparation of lesson plans is right on target and systematic and adapted to the concept of implementing a teaching factory.

2.3. Teaching Factory 6 Steps (TF 6M)

The TF-6M Model Implementation Formula is "Integrating one or several Productive Subjects with Entrepreneurship Subjects, carried out in a block of time which also serves as the implementation of industrial work practices (prakerin) followed by a Competency Test and ends with the development of Entrepreneurial Crafts. Preparation for the implementation of TF-6M begins with preparations covering administration, training materials, material preparation, machine and tool preparation, RPP which is adjusted to the competence of each expertise.

The characteristics of the TF-6M model can be seen schematically in Figure 1 below.

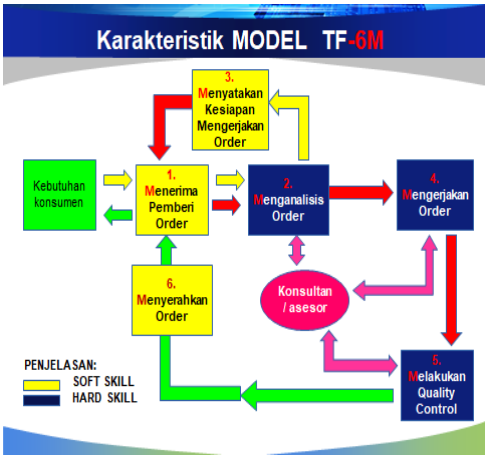


Figure 1. Schematic of the TF-6M Model (source: Dadang Hidayat)

Based on the picture above, the six steps for implementing the TF-6M model include:

M-1 Receiving the giver of the order
M-2 Analyze orders
M-3 Declare readiness do orders
M-4 Carrying out orders
M-5 Perform quality control
M-6 Submitting orders

It was also explained that in the TF-6M model it shows how soft skills and hard skills are absolutely owned by every student, this is a form of competence that students must have related to the climate in the world of work.

The implementation of the TF-6M Model begins with preparation for implementation and continues with three main activity stages: the preliminary stage, the core stage and the evaluation stage as follows:

a. Invite students to change school (climate) management into industrial (climate) management rationally, teachers and students discuss various arguments, and agree on an alternative model

(Model TF-6M). Strategies, approaches and learning methods: problem solving; inquiry, discovery; role playing.

b. Communication training: Explaining communication, giving examples of good communication, training students to communicate to receive orders, expressing ability to carry out orders and how to submit work results to those giving orders. Communication training includes:

   1) general communication training,
   2) public speaking,
   3) effective communication,
   4) marketing communications and
   5) practice speaking

c. Order analysis exercises: Guide students to read drawings, determine materials, machines, cutting tools, machine speed, calculate time, price, and work safety. This order analysis exercise is tailored to the competency of the productive field.

3. RESEARCH METHODS

The implementation of the TF-6M model which was carried out by teachers at SMK Negeri 1 Garut Regency as a program object, was designed on several competency skills that could develop product and service services, designed in an integrated manner on several competencies or subject matter. In its implementation, the design of action research (action research) is developed with the aim of finding solutions to social problems (including education). Action research is initiated by a systematic study of a problem [3]. The results of this study are used as a basis for preparing a work plan (action) as an effort to overcome these problems. The next activity is the implementation of the action followed by observation and evaluation. The results of observation and evaluation are used as input to reflect on what happened during the implementation of the action. The results of this reflection are then used as the basis for determining improvements and perfecting further actions.

According to Kemmis, action research is a form of self-reflective research conducted by participants in social (including educational) situations to improve their own practice [3]. In doing so, a comprehensive understanding of the practices and situations in which they are carried out will be obtained. There are two main things in action research, namely improvement and involvement. This will direct action research objectives into three areas, namely; (1) to improve practice; (2) for professional development in the sense of increasing practitioners' understanding of the practices they carry out; and (3) to improve the circumstances or situations where the practice is carried out.

In the field of education, especially in learning practices, action research develops into Classroom Action Research (CAR) or Classroom Action Research (CAR). CAR is action research carried out in the classroom when learning takes place. CAR is carried out with the aim of improving or increasing the quality of learning. CAR focuses on the class or on the learning process that occurs in the classroom.

CAR is a form of action research that is applied in learning activities in the classroom. The special feature of CAR is the existence of concrete actions carried out as part of research activities in order to solve problems. These actions are performed in natural situations and are aimed at solving practical problems. Actions taken are activities that are deliberately carried out on the basis of a specific purpose. Actions in CAR are carried out in an activity cycle.

There are a number of characteristics that are unique to CAR compared to research in general, including the following.

a. CAR is an activity that not only seeks to solve problems, but at the same time seeks scientific support for solving these problems.

b. CAR is an important part of efforts to develop the teaching profession through critical and systematic thinking activities and teaching teachers to write and take notes.

c. The problems at issue in CAR are not the result of theoretical studies or previous research, but stem from the existence of real and actual problems (which are happening at this time) in classroom learning. CAR focuses on solving practical problems, not theoretical problems.

d. CAR starts from simple, real, clear, and sharp problems regarding things that happen in class.

e. There is collaboration (cooperation) between practitioners (teachers and school principals) and researchers in terms of understanding, agreement on problems, decision-making which ultimately gives birth to similarities regarding actions (action).

f. CAR is carried out only if; (a) There is a group decision and commitment to development; (b) Aims to increase teacher professionalism; (c) The main reason is curiosity, want to help, want to improve; and (d) Aims to acquire knowledge and or as an effort to solve problems.

3.1. Location and Research Object

The objects of this research program are productive teachers at SMKN 1 Garut covering competency skills namely Accounting and Institutional Finance, Medical Laboratory Technology, Network and Application Informatics Systems, Renewable Energy Engineering,

Logistics Management, Clinical and Community Pharmacy, Computer and Network Engineering, Automation and Office Governance, Online Business and Marketing, Multimedia.

Teachers involved in learning that implement the TF-6M learning model include:

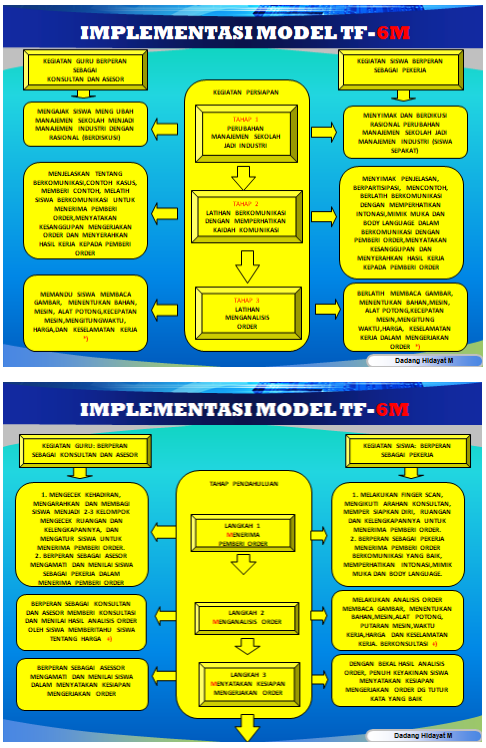
a. Productive Teacher Competency Skills
b. Master of Creative Products and Entrepreneurship
c. Adaptive and Normative Teachers

3.2. Implementation Steps

To anticipate the problems faced, it is necessary to find a solution in an appropriate and fast way. The method that can be chosen is the peer coaching method, which is a method used to convey information, messages, ideas, knowledge carried out by colleagues. In this case the team of lecturers from the UPI Faculty of Technology and Vocational Education are colleagues for teachers at SMKN 1 Garut.

Several stages of TF-6M implementation activities are described as follows:

a. Conduct training for teachers to provide an understanding of the implementation of the teaching factory learning model with six steps.



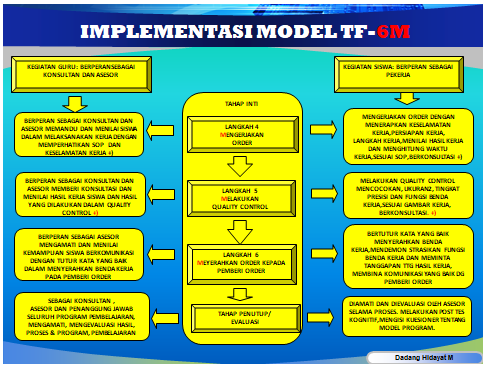


Figure 2. TF-6M implementation

b. Equalizing the understanding of educators' paradigms for innovation in learning.

c. Conducting training and mentoring in classroom action research and in compiling scientific work based on the results of classroom action research.

4. FINDINGS AND DISCUSSION

Based on the presentation, consultation and assistance in the TF-6M implementation activities, qualitatively obtained data related to the description of the implementation of TF-6M learning activities in several competency skills. The presentation of TF-6M is a continuation of the previous activity with the following steps:

4.1. Insights about TF 6M

Given to teachers and lectures on the concept of teaching factory with 6 steps (TF 6M). The activity was attended by almost all productive teachers and PKK teachers from all skill competencies. The training emphasized the benefits of TF 6 M to be used as a learning method. Through training on the teaching factory concept, there are several indications that can be seen from teachers including:

a. Understanding of the teaching factory learning method associated with productive subjects in each skill competency.
b. Understanding the planning stages of implementing the six-step teaching factory.
c. Increased teacher readiness in implementing the six-step teaching factory learning model

4.2. CAR Insights

So far, writing scientific papers (KTI) is a scourge for teachers. The lack of a reading culture causes teachers to be less able to write well. In fact, writing starts with a lot of reading. If you have read a lot, of course the teacher will be interested in researching what you read. Research starts from a problem. Problems can be solved if we do research. Research can be carried out if there is an effort

from the teacher to improve the quality of learning in schools.

A study conducted by the teacher in his own class by planning, implementing, and reflecting on actions in a collaborative and participatory manner with the aim of improving his performance as a teacher, so that student learning outcomes can increase is called Classroom Action Research (CAR). The CAR problem must start from the teacher himself who wants to improve and improve the quality of his learning at school in order to improve the quality of education.

In CAR, the teacher must act as a teacher as well as a researcher. The focus of research is in the form of learning activities. The teacher is the person who is most familiar with the class, and usually the interactions that occur between the teacher and students are unique. Teacher involvement in a variety of creative and innovative activities that are developmental in nature requires the teacher to be able to carry out CAR in their class.

4.3. CAR Proposal Preparation

Provide insight into the form of class action research proposals. The participants were grouped according to their competency expertise. Preparing CAR proposals is carried out in detail so that they can be implemented properly. Conducting classroom action research to improve the quality of learning is one of the demands of teacher competence; Their main difficulty in CAR is how to formulate a proposal.

Preparing a CAR Proposal begins with writing the title and identity of the researcher: CAR is a real activity, to improve the quality of PBM; is an action by the teacher to students that must be different from the usual activities; occurs in a continuous cycle; minimum of two cycles. The title contains a description of the efforts made to improve learning according to the results of the analysis of student characteristics in previous learning, the actions taken to realize efforts to improve learning, and the research setting.

The introduction consists of: Background to the Problem, Formulation of the Problem, Objectives and Benefits of the Research. Theory and hypothesis studies include subject theory, subject learning theory, learning theory action variables (X) according to process standards, variable theory to be corrected (Y) including what activities must be carried out to measure it. Review of relevant research results, frameworks and hypotheses for action. The research method describes the subject and time of the study, the variables studied (the operational definition of each variable and its grid), the research procedure which contains a description per cycle (design, implementation, observation/data collection/ instrument, reflection), action plan consisting from: 1) Lesson plan 2) Activity plan, 3) What plan will be observed, and 4) Data analysis plan. Data and how to collect it: explain each variable along with the instruments used and the performance indicators for each variable; end with data analysis. The final part of the proposal is in the form of a bibliography and attachments.

4.4. TF-6M Implementation Results

The results of the implementation of the TF-6M Model in several skill competencies show:

a. Indicators of student soft skill and hard skill competency indicators can be achieved perfectly, as well as student entrepreneurship competence;

b. The resulting implementation framework for the TF-6M Model is a general reference in implementing the TF-6M Model, including planning aspects, TF-6M flow guidelines, TF-6M learning scheduling, availability of budget and supporting infrastructure, materials or practical materials;

c. The resulting forms of services and products produced in the implementation of the TF-6M model, although they have not met the service standards and product standards that have been set. dishwashing soap products, and making software for use in culinary services.

In the implementation of the TF-6M model at SMKN 1 Garut, several obstacles and challenges were also encountered, both related to the alignment of the model concept with existing competency skills in the SMK, including:

a. The ability to convince school principals because the implementation of the TF-6M Model requires policy support from school leaders;

b. There is still resistance from teachers, such as feeling disturbed by changes; over/under estimate of Model TF-6M; do not have vocational competency skills and professional attitudes;

c. The readiness of the students themselves considering that in the implementation of TF-6M it is necessary to change the scheduling of students' activities at school compared to the usual school schedule.

d. Budgetary support is needed to facilitate the initial preparation of infrastructure facilities that are used as places for services and product manufacturing. The rest when activities are running, and produce services and product sales, it will generate income generating for the school.

This is reinforced by the findings of Wijanarka that the implementation of Tefa requires clear regulations, system integration and flexible scheduling. Of course, to achieve the goal, Tefa implementation must be well managed [4].

5. CONCLUSIONS

The results of implementing the TF-6M model in SMK through classroom action research carried out by productive teachers at SMKN 1 Garut, namely:

a. The training of teachers in designing the TF-6M model learning design in the form of Learning Implementation Plans (RPP) with teaching materials in productive groups.

b. The development of teachers in implementing the TF-6M learning model in SMKs in services and products produced in productive subject groups.

c. The development of teachers in evaluating the TF-6M model learning program through the stages of classroom action research.

d. The development of the teacher's ability to compile scientific work is based on the results of classroom action research that has been carried out

The implemented TF-6M model is basically one of the innovations that can be developed in Vocational High Schools, but some adjustments are needed that can be aligned with skill competencies because not all of them can be implemented in all skill competencies. There is a need for alignment with service standards, process standards and product standards as selling points and comparison with existing ones, so that SMKs need to collaborate with industry, associations and related agencies in equalizing service and product standards.

The TF-6M implementation model should be made as a guide for schools, so that it becomes one of the advantages of SMK which is always implemented by school leaders, even though the leadership changes. Finally, the readiness of productive teachers and the support of adaptive and normative teachers in giving their touch related to the formation of students' entrepreneurial character is an important aspect through the implementation of TF-6M. Saputro adds that it is important to evaluate and improve to improve the quality of teaching factory implementation [5].

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