EVALUATION OF METAL CRAFT TEACHING FACTORY (TEFA) PROGRAM AT SMK N 5 YOGYAKARTA

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Abstract. The purpose of this research was to determine the suitability of the implementation of the Teaching Factory (TEFA) program in production and business-based learning carried out in improving the business and industrial world at SMK Negeri 5 Yogyakarta by using the CIPP evaluation model (Context, Input, Process, and Product). This study uses percentage descriptive data analysis, using data collected in the form of observation, interviews, and questionnaires. The results of the research on the implementation of the Teaching Factory program obtained criteria according to an average percentage of 78.77%, with context criteria of 90%, input 73.33%, process 72%, and product 72%. In order for the goals of Teaching Factory to run smoothly and in accordance with the goals of TEFA, teachers make efforts to increase learning from the obstacles encountered in the process of implementing TEFA so that graduates have competent standards in the business and industrial world.

Keywords: Evaluation, Teaching Factory, CIPP

INTRODUCTION

The educational institutions taken in formal schools after graduating from Junior High School (SMP) are Senior High Schools (SMA) or Vocational High Schools (SMK). The final competence of graduates is one of the main factors determining high school or vocational education. Graduation considerations determine whether after graduation you will work in the world of business or industry or will continue your studies at a higher level. Research on the development of a vocational education curriculum based on Information Technology developments and industrial needs conducted by Rosina, Virgantina, Ayyash, Dwiyanti, & Boonsong (2021,p.105) states that in Indonesia SMK graduates need to form graduates who have hard skills and soft skills by applying vocational education curriculum that is following the business world and the industrial world so that vocational education graduates do not experience difficulties in the development of industrial technology. In facing the industrial revolution 4.0, SMK graduates need to have the ability to be creative, and imaginative in innovating and being creative that integrates with technological advances so that they can compete with the competition in the business world and the industrial world.

Based on the results of an analysis of the business and industrial world demand for the competencies of vocational graduates needed by DU/DI (Perdana, 2019, p.172) to achieve labor market balance, namely: having competency certificates, having IT and foreign language skills, and having work experience. The standard competency certificate criteria are not easy to obtain for graduates when looking at the economic conditions of SMK students, who on average do not wish to continue their higher studies and work immediately after graduation because they want to quickly help their family's economy. This condition is one of the main factors for the lack of competence of SMK graduates to be able to face the challenges of the business and industrial world. In addition, SMK graduates are the highest graduates in Indonesia in scoring unemployment in the last 5 years based on research conducted by Wijaya & Utami (2020, p.801) identifying the causes of vocational graduates becoming unemployed using Sakernas 2020 data showing that the variables are gender, disability, area of expertise, years of graduation, and training participation have a significant effect on unemployment in vocational schools with a

tendency to experience unemployment, namely men, not disabled, come from other areas of expertise, graduate within one year, and have never attended the training. This fact is certainly contradictory to the goals of SMK graduates. This is one of the challenges of the Vocational Education Curriculum to be able to print and produce truly competent SMK graduates. One of the government's efforts to resolve institutional discrepancies with DU/DI at Indonesian Vocational High Schools to produce graduates who meet the business and industrial world suitability is through the TEFA (Teaching Factory) learning program.

TEFA (Teaching Factory) learning is one of the solutions needed in preparing SMK graduates who have the competencies needed for the business and industrial world which are integrated into production units organized by schools. Through TEFA, students practice not only processing individual skills, but students also study in groups so that they will train students in communicating with others and gain real experience in preparation for entering the business and industrial world. Research conducted by Rohmah, Sari, & Wulansari (2019, p.325) shows that the implementation of TEFA (Teaching Factory) in several 9 SMKs in Surakarta in terms of TEFA learning activities with the largest presentation was stated to be good (39, 51%) by teachers, while the production process was declared not good (44.44%). While the results of the evaluation of the implementation of the TEFA policy program at DKI Jakarta State Vocational Schools conducted by Supriyantoko, Jaya, Kurnia & Habiba (2020, p.1) found criteria that were very suitable with an average percentage of 89% and the need to make adjustments in several schools such as teachers who have appropriate capabilities in running TEFA, TEFA organizational structure, and products that can compete with the business and industrial world. From the research data above, there are quite large presentation differences related to the process of conformity to the TEFA program that takes place in schools. Therefore, it is necessary to evaluate the implementation of TEFA at SMKs in several other places.

Evaluation according to Febriana (2021,p.1) in a broad sense evaluation is a process of planning, obtaining, and providing information that is needed to make various alternative decisions. Therefore evaluation has three implications: first, evaluation is carried out continuously, second, the evaluation process is directed at a specific goal, and third, evaluation requires the use of accurate and meaningful measuring instruments. Therefore, to determine the suitability or non-compliance of the specific objectives of the TEFA program, it is necessary to evaluate the program. In this regard, the evaluation of the implementation of the TEFA (Teaching Factory) learning program in Vocational High Schools. From the description above, the problem is formulated to find the answer as follows:

In an educational program evaluation is one of the components used in determining the level of success of an educational process. Evaluation has several meanings, such as evaluation according to Guba (1970, p.3-6), namely: (1). Evaluation is a measurement developed by a measurement instrument expert, (2). Evaluation determines the suitability between performance and behavioral goals, which have a large impact on goals, (3) Evaluation is an assessment. Guba also emphasizes that evaluation is a process of obtaining clarity, providing useful information, and assessing alternative decisions.

In characterizing and assessing using an evaluation approach having various types of activities in classifying program evaluations carried out according to Daniel L. Stufflebeam (2001, p.11) must be based on the level of suitability with a particular evaluation. Evaluation to Stufflebeam means a study designed and conducted to help several audiences assess the merits and value of an object. Evaluation activities have the aim of improving, not proving so that evaluation can obtain accurate, up-to-date information relating to the implementation of a program with information to make decisions. There are several objectives of evaluating learning programs according to Silalahi (2020, p.16), namely: (1). Deciding how successful the program is, (2.) Concluding whether or not a program is appropriate, (3). Knowing the cost of implementing the program, (4). Knowing the strengths and weaknesses in a learning program, (5). Identify parties in obtaining benefits, (6). Formulate policies regarding who will be involved in the next program.

Various evaluation models have been developed, such as the Tyler model, the Countenance model, the Scriven model, the Summative-Formative model, the Context Input Process Product (CIPP) model, the Kirkpatrick model, and the Goal-Free Evaluation model. The Tyler model emphasizes the existence of a direct evaluation process based on instructional objectives to produce different information needed for program improvement (Worthen, Sanders & Fitspatrick,

1997, p.44). The Countenance Model developed by Stake demonstrates its effectiveness by facilitating a thorough check of quantitative data during all stages of the training (Wood, 2001, p.18). The Scriven model emphasizes testing the benefits or value of the product. According to Scriven that an evaluator needs to be aware of the purpose of the program in order to provide a strong perceptual bias on any positive or negative impacts that the program has in order to let go of the possibility of distorted results (Scriven, 2000, p.257) The summative evaluation model is carried out after the program has been completed for a period certain time, while formative evaluation is carried out at the end of each activity unit at each face-to-face meeting. The Context Input Process Product (CIPP) model in evaluation for aspects of context, input, process, and results (Silalahi, 2020, p.17). Kirkpatrick's model measures the extent to which the influence of training within a certain period of time on a person (training) by describing the implementation of reactions, learning, behavior, and results that are critical to set the table for training and evaluation of success (Kirkpatrick, 2009, p.1-2). The Goal-Free Evaluation model focus on increasing knowledge about the impact of the program or on actual results, not just the goal (Glatthorn, Boschee, Whitehead, & Boschee, 2019, p.504).

From the description above, as Stufflebeam said, the evaluation of an activity or program has many different variations, so to be able to evaluate a program, it is necessary to pay attention to the evaluation model used so that the results obtained are appropriate and on target. So that some of the evaluation models above, the selection of evaluation models must be adjusted to the characteristics, programs, and objectives to be evaluated later.

The CIPP Evaluation Model developed by Stufflebeam & Guba according to Robert S. Randall (Nicholson, 1989, p.40) has a main object system that is to maximize the effectiveness of critical decisions which are made as reporting of relevant information in a form of use that is appropriate to the stages of the decision maker by on time. The CIPP Stufflebeam & Guba model has core concepts according to its acronym, namely Context, Input, Process, and Product Evaluation, abbreviated as CIPP. This concept has the meaning as stated by Stufflebeam, Madam & Kellaghan (2000, p.279) that in the context evaluation section refers to the assessment of needs, problems, and opportunities as a basis for determining goals and priorities as well as in assessing the significance of the results. In the evaluation section, input refers to alternative approaches to meeting needs.

The teaching factory concept is included in the curriculum and teaching components in SMK. In order to be able to implement the curriculum carried out by teachers in classroom learning or when practicing in school workshops it does not only focus on tools in developing new and logical scientific constructs in various fields of study but also must be aggressive in fostering student creativity so that able to develop their competencies (Widiatna, 2019, p.30). Teaching factory (TEFA) was developed by Cal Poly which combines theory and applications adapted to the real industry with the latest industrial equipment through hardware and software on computers that have systems, such as environments with real factory hardware functioning as planning and control center on production. The purpose of the teaching factory according to Alptekin, Pouraghabagher, Mcquaid & Waldorf (2001: 943):

1. Producing graduates who are better professionals by providing advanced concepts in modern manufacturing so that they can compete effectively in today's industrial world.
2. To enhance current curriculum developments that focus on more modern manufacturing concepts.
3. To demonstrate how viable solutions are in the dynamics of technological challenges across integrated business enterprises.
4. To transfer information technology from companies and partners to student activities, projects with teams, and projects with seniors as the main way.

Vocational High Schools (SMK) have a relationship with the industrial world that is not dichotomous, but this relationship is mutually responsive, schools have a cooperative relationship with the industrial world with the aim of providing a bridge between the needs gap in more skilled competencies in vocational schools and the workforce (Widiatna, 2019, p.37). Meanwhile, according to Chryssolouris, Mavrikios, & Rentzos (2016, p.45), the aim of the teaching factory is to integrate education, research, and innovation activities in initiatives that involve industry and academia. Therefore the TEFA paradigm focuses on integration within industry and academia, through new adaptations to teaching or training curricula with ICT-based delivery.

In the assessment of the teaching factorys program (TEFA) according to Alptekin, Pouraghabagher, Mcquaid & Waldorf (2001, p.943) it is assessed based on the success of the program in the form of direct results and the results of long-term monitoring such as: 1) measured through the number of new subjects by introducing the concept of teaching factory on a series of programs, information on mass production, and the concept of factory simulation to products, 2) improve the curriculum in projects involved in teaching factory activities and are dedicated to studying the same issues, 3) demonstrate feasible problem solving (solutions) in the form of the software and the number of presentations/ reports made to industrial partners, 4) transfer of technology from corporate partners, 5) master project work as well as with senior project work, 6) industrial prizes showing significant immediate success in the initial objectives of the ongoing project (if there is no presentation of results to industrial partners). In the long-term assessment of the project, objectives will continue to track the listed metrics and collect additional data within the scope of the continuous improvement efforts currently implemented for the teaching factory (TEFA) program, then separate assessment data sets are collected annually to measure the program objectives whether it is in accordance with the objectives of the teaching factory (TEFA). Graduates from alumni, alumni supervisors, and industry advisers are all regularly surveyed to provide feedback on the success of program goals and outcomes such as preparing students to contribute directly to their engineering practice and providing students with opportunities to use modern tools and technologies needed in engineering practice, skills to carry out integrated design, competitions in computer systems and information technology, and of course the learning classes are accompanied directly. The results of the assessment are directly related to the aim of the teaching factory to produce better professionals in curriculum improvement. The outcome data is then collected and reviewed annually leading to action whenever the metric shows potential for improvement.

RESEARCH METHOD

This research is qualitative research using the CIPP model evaluation approach (Context/context, Input, Process/Process, Product/Product) which is a research with percentage descriptive data analysis in the form of a narrative, where the results of the data obtained are collected and analyzed.

Table 1. Teaching factory program evaluation instrument (TEFA) adapted from the CIPP model in the Metal Craft Arts Department at SMK N 5 Yogyakarta

No.	Component	Indicator	Data source	Data Collection Instrument
1.	Context	Metal Craft Department Profile	Metal Crafts Teacher	Guidelines for interviews, observation, and documentnalysis
		(Department of metal crafts, data administration completeness, curriculum, learning media)	Teacher and student	Questionnaire guidelines
		TEFA goals	Presence of the Department of Metal Crafts	Document analysis
		TEFA program participant criteria	Teacher and student	Questionnaire guide
		TEFA program benefits	Facilities and infrastructure majoring in Metal Craft Arts	Observation guide
		Facilities and infrastructure	Teacher	Observation guide

2.	Input	Human resources in the TEFA program	Teacher and student	Observation guide
		TEFA program strategy	Teacher and student	Observation guide
		Financial Administration of the TEFA program	TEFA Administration	Interview
		Transfer of skills and technology within the school's corporate partners	Teacher and student	Observation guidelines, interviews
3.	Process	Implementation of TEFA activities	TEFA class	Guidelines for observation, documentation, recording/video
		Program participants in the implementation of TEFA activities (student attendance)	TEFA class	Document analysis (TEFA class presence)
		Appropriateness of the TEFA program implementation process with DU/DI	Teacher and student	Questionnaire guide
		Use of TEFA Workshop Facilities	TEFA practice room (workshop).	Guidelines for observation, documentation, recording/video
		Use of TEFA Learning Media	Classroom	Observation guide
		Teacher guidance in student product problems	TEFA class	Observation guide
		Product quality control	TEFA class	Observation guide
		Teacher's ability in TEFA classroom management	TEFA class	Observation guide
		Student skills in TEFA classes	TEFA class	Observation guide
		Direct field practice with school corporate partners	Student	Observation guide
4.	Product (Produk)	Kelayakan produk *TEFA* dalam pasaran	Feasibility of TEFA products in the market	Observation guide
		Performansi produk *TEFA* (pameran)/ pemasaran	TEFA product performance (exhibition)/ marketing	Observation guide
		Kemandirian siswa berwirausaha (DU)	Entrepreneurial student independence (DU)	Observation guide
		Kesesuaian produk *TEFA* di dalam dunia industri (DI)	TEFA product suitability in the industrial world (DI)	Observation guide

RESULTS AND ANALYSIS

1.1. Implementation of the TEFA (Teaching Factory) program with the CIPP model

Based on the results of observations of the TEFA (Teaching Factory) program with the CIPP model in the Metal Craft Arts Department at SMK N 5 Yogyakarta through observation, interviews, documentation, and data analysis were collected based on components and indicators on the Teaching Factory Program (TEFA) Evaluation Instrument for Craft Arts Metal (table 1). The data were analyzed using qualitative in the form of a narrative from the percentages and evaluation results as follows:

1. The Context component gets a percentage of 90% on the profile indicator for the metal craft department at SMK N 5 Yogyakarta, criteria for TEFA participants, TEFA infrastructure, and

completeness of TEFA supporting data/sources. The components of the goals and benefits of TEFA obtained a percentage of 89.18%, with the criteria for the Context component being very consistent with the program TEFA.

2. In the Input component, a percentage of 73.33% was obtained for the human resource indicators in the TEFA program, TEFA program strategy, TEFA program financial administration, transfer of skills and technology in school company partners in improving TEFA skills).

3. For the Process component, a percentage of 72% was obtained for the metal craft department profile indicator, TEFA activity implementation, program participants in TEFA activity implementation (student attendance), suitability of the TEFA program implementation process with DU/DI, use of TEFA workshop infrastructure, use of TEFA Learning Media, Quality Control of TEFA products (QC), teacher guidance on student product issues, teacher abilities in managing TEFA classes, student skills in TEFA classes, direct field practice with school corporate partners.

4. In the Product component, a percentage of 69.33% was obtained from the feasibility indicators of TEFA products in the market, TEFA product performance (exhibition)/ marketing, student entrepreneurial independence (DU), and TEFA product suitability in the industrial world (DI).

1.1.1. Context Evaluation

The results of the evaluation of the Context component based on the indicators above found criteria that were very suitable for the implementation of the TEFA (Teaching Factory) program in the Metal Craft Arts Department at SMK N 5 Yogyakarta. Some of the Context evaluation results in the TEFA program began with evaluating the profile indicators of the metal craft department at SMK N 5 Yogyakarta. The Metal Crafts Department has 5 teachers and 6 parallel classes, at each level there are 2 classes, and each class has 27 students.

Fig. 1. TEFA practice room and storage room for tools and materials

The facilities and infrastructure consist of theoretical classrooms that have projectors for each class which support the learning process using the media. The metal craft department has 4 workshops that have different functions, a metal craft student work room, a metal teacher's office room, a metal living room, a metal multimedia room, an etching practice room, a welding practice room, a turning practice room, and an exhibition room. The workshop used in practice has a space for storing materials and materials needed during TEFA practice.

Based on the criteria for TEFA participants, it was found that there was a selection process for entering majors, the selection of majors was based on participant criteria, participants had an interest in the world of business and the creative industry, participants had skills in designing metal craft art designs, and participants had activeness in creating metal craft art. In terms of data completeness, the results obtained from evaluating lesson plans, syllabi, attendance lists, grade lists, knowledge assessment tools (question bank), skills assessment tools (observation sheets, journals, etc.), attitude assessment tools (observation sheets, self-assessment, journals, etc.)), assessment results documents (portfolios, project reports, student products/work, TEFA implementation handbooks, teacher handbooks. For TEFA implementation handbooks could not be found that were following the TEFA program for each generation.

The objectives and benefits indicators obtained very suitable criteria from the following aspects:

1. The lessons conveyed by the teacher prepare graduates of SMK N 5 Yogyakarta to become workers and entrepreneurs.
2. The teacher helps students choose their field of work after graduation according to their area of expertise.
3. Teachers also help students of SMK N 5 Yogyakarta in preparing themselves to become workers.
4. Help establish cooperation with the real and actual world of work.
5. Producing metal craft products both functionally, and in decoration, as well as items that have added value.
6. Increase cooperation with relevant industries or the business world.
7. Improving creativity and the practice of creating art.
8. Students can realize direct knowledge and work practice in entering the real world of work.
9. Learning is carried out as a means of direct production-based training and practice for SMK students to support the achievement of mastery of competencies required by DU/DI (business world and industrial world).
10. TEFA learning at SMK N 5 Yogyakarta is practiced as direct production training to support competency achievement in mastering the skills required.
11. As a training process for student independence to enter the business world and industrial world.
12. Creating superior students (graduates) of SMK N 5 Yogyakarta according to market needs.

Metal Craft at SMK N 5 Yogyakarta has a concentration in TEFA learning, namely jewelry, decoration, lathe welding, and casting. At the class level, there are different concentrations of material. In class X majoring in metal, the material taught is more focused on making metal craft designs both as ornamental objects/display objects or decorations as well as functional objects. In the metal craft design, starting from the rough design to the color. Colors and shapes are made in detail complete with size. Material design designs are carried out in semesters 1 and 2 by applying several decorative motifs from the archipelago, abroad, and your own creations. In each semester workshops in metal crafts and their functions are introduced. From the planning designs that have been made, students have started to practice making or realizing their planning designs by practicing simple objects, as what is usually done is making basic ring jewelry that doesn't have too many techniques. At the tenth-grade level, the focus is more on forms of art introduction in planning, arrangement techniques in fine art principles, and basic techniques in metal craft workshops. The introduction of jewelry engineering material that is taught in the metal department in class X is the forging technique. The tools used in the forging technique are a jewelry workbench, a set of gasoline-fired furnaces, a set of LPG-fired furnaces, a crucible (where the metal is to be melted), an anvil for heating, ingots, long pliers, combination pliers, anvil, combination hammer, wooden hammer, mandrel range, bracelet mandrel (anvil in forming bracelet circles), plate files, jewelry file sets, plate/half-round emery sticks, special jewelry saws, special jewelry saw eyes, table vise, ring handle, measuring rings, scrapers, burners, bowls, glasses, stoves, and polishing machines. Materials used in jewelry practices such as silver, and copper.

Fig. 2. The tools used by TEFA class X practice

The learning material for class XI is to continue the skills obtained in class X, majoring in metal crafts at SMK N 5 Yogyakarta, namely referring to jewelry, decoration, lathe welding, and casting along with the techniques to be used. Some techniques not practiced in TEFA workshops are only introduced through learning materials, during practice the teacher teaches several forging techniques, metal brazing techniques, *sodhet* (press) techniques for making decorations, forging techniques, sawing techniques, casting techniques, sand molding techniques, lathe techniques. , and oxyacetylene welding.

Fig. 3. Practical tools for welding, soldering, tapping, and forging techniques used by TEFA class XI practice

Class XII majoring in Metal Crafts in the TEFA program uses the link and match concept. In this concept, students are directed to dig deeper into the competencies or skills that will be needed in the future job market. The link and match concept at SMK N 5 Yogyakarta requires collaboration with the world of work or the industrial world on a professional scale so that the level of relevance in education can be increased, which with this work principle can also benefit the business world and the industrial world if you can do the concept accordingly. Therefore SMK N 5 Yogyakarta took concrete steps and training in adjusting programs in education and job training in it. Through functional collaboration on the link-and-match concept, it creates a big enough opportunity to be able to give birth to a new and actual experience. SMK N 5 Yogyakarta, majoring in metal craft, collaborates with companies that have become partners in channeling human resources as a real training and learning process for the metal craft department, namely through fieldwork practice (PKL) or industrial work practice (PRAKERIN) in class XII semester 1. In semester 2, class XII is more focused on selecting skills or concentrations used in UKK (Graduation Competency Test) activities majoring in metal crafts at SMK N 5 Yogyakarta. Therefore students choose 2 skills in the field of metal which will be chosen from metal crafts in jewelry, decoration, lathe welding, and casting. Materials taught such as choosing materials, preparing, and making products on decorative objects (decoration) or functional objects (use) with oxy-acetylene welding to the finishing process. Students also prepare materials, select materials, and make decorative objects (decoration) or functional objects (use) using lathe techniques. The final results of the products produced by students will be exhibited and traded in the annual exhibition with the Metal Craft Arts Department, SMK N 5 Yogyakarta. The exhibition results obtained will later be calculated according to the amount of student capital, school capital, and profits from the school and students, in accordance with school and government regulations

1.1.2. Input Evaluation

In the results of the evaluation of the input components, the criteria are in accordance with a percentage of 73.33% from several indicators such as:

a. Human resources in the TEFA program, as for several aspects that are assessed such as the selection process for entering the metal craft department, the selection of majors based on student criteria, students also have an interest in the business world and industrial world have sufficient skills in designing metal craft designs, and also has sufficient activity in creating metal craft art.

b. TEFA program strategy majoring in metal arts. This indicator has several assessment results that teachers majoring in metal crafts have learning strategies if they encounter obstacles in the

implementation of TEFA. If there are obstacles in its implementation, the teacher makes a special strategy that is adapted to the conditions of students' difficulties.

c. The financial administration of the TEFA program has evaluation results from financial administration staff which documents cannot be shown due to their personal nature. However, the program has an adequate budget that is funded by the government in the TEFA program in accordance with the submission of tools, materials, materials, and completeness, practice infrastructure tools. The metal arts department has good financial management and management, and practice expenses are well structured and systemized from expenses to accountability reports of expenses and student products that sell well.

d. Transfer of skills and technology within the school's corporate partners. To update skills and technology according to TEFA, the metal craft department also conducts training for both its teachers and students. From the information obtained, if holding skills that are new in nature, the teacher asks to submit training (training) first, after being proficient the teacher invites expert figures from the school link to be willing to teach students and also provide skills. For example, what has been done before at SMK N 5 Yogyakarta is to send several teacher representatives to practice more, then after they are proficient they will teach it to students and invite company links to work with schools to teach students and motivate their skills development. Furthermore, the training development process and final results will be guided by teachers who receive training.

From the description above, the results of the input evaluation produce information from all HR input, obstacles, finances, and the addition of new knowledge and skills according to the world of industry and technology, teachers are able to run the TEFA program according to their abilities and upgrade new knowledge for teachers and their students have been running properly. The financial administration section has also received a TEFA program budget which has been systematically compiled in daily records for the metal craft department, complete with financial reports and proof of transactions that can be accounted for. For borrowing practice tools, requests for materials, and materials there is also a staff section that manages them which goes very well. As shown in Figure 4 below, where in the photo every student who requests TEFA materials and materials must obtain permits and submissions, then after being approved by the officer concerned they will be given the materials and materials needed. These records will certainly help the financial administration section in financial reports that can enter and leave the provision of tools and practices.

1.1.3. Process Evaluation

In the process evaluation component of the TEFA program at SMK N 5 Yogyakarta, the appropriate criteria (percentage 72%) were obtained with several indicators such as:

a. The implementation of TEFA activities is in accordance with the standard processes in teaching factory learning. Each class has different activities according to the level and achievement of learning competencies.

b. Participants in the teaching factory program in carrying out activities (student attendance) have a percentage of 90% present. Students prefer to come to school and participate in TEFA learning practices than students participating in online learning. Students can directly practice and consult directly related to the difficulties they face.

c. Appropriateness of the TEFA program implementation process with the business world and industrial world.

d. The process of implementing learning is in accordance with the stages of the process with a learning approach in the business world and the industrial world.

e. The use of TEFA workshop facilities is put to good use both by teachers who teach it as one of the learning media and by students when practicing the material that has been given by their teacher. Students can make good use of all the facilities in the TEFA workshop.

f. TEFA learning media in the metals department has many uses of media such as projectors, language/computer labs for design, and production tools found in several TEFA workshops. Various media are adequate and well utilized by teachers and students so that they are in accordance with the proper use of learning media.

g. The teacher guidance program on student product issues is running according to the TEFA program planning. Students carry out guidance when learning takes place if they experience problems and confusion in the process. The teacher also checks each student and controls student activities so that they are in accordance with the rules and targets for achieving student skills.

h. TEFA product quality control (Quality Control). The teachers are assisted by an expert who is invited to the school to test the quality of the product whether it is in accordance with the standards of the business world and the industrial world or not.

i. The teacher's ability in managing the TEFA class is good and in accordance with TEFA standards. The teachers are not clueless about the latest technology, in terms of skills in using the tools and media available at school, the teacher is fluent in demonstrating the use of the tools in the TEFA workshop without any problems.

j. The skills of students in the TEFA class are in accordance with DU/DI standards. However, not all students understand and are responsible for the use of the means of production. Cooperation between groups is one of the keys to the success of skills in class, where students can share difficulties and share in production so that students' skills can be evenly distributed according to standards.

k. Direct field practice with school corporate partners has been going well. The selection of companies is adjusted to the abilities and skills of students at school. Students do PKL (Field Work Practice) in semester 1 of class XII. The practice has been adapted to the expertise of each student.

In the learning process of the TEFA program at SMK N 5 Yogyakarta, there are levels of achievement targets in the program, as discussed in the context evaluation (Contexts) that each level has materials and techniques in TEFA class practice according to its class, namely in class X focused on introducing basic techniques and design, class XI in the processing of several *sodhet* techniques, forging techniques, sawing techniques, welding, dragging, and casting. Class XII chose 2 techniques that would be used as masterpieces for the final product and an assessment of the feasibility of TEFA products.

Since 2021 based on a policy from the Ministry of Education and Culture (Ministry of Education and Culture, Research and Technology) at the beginning of learning for the 2021/2022 academic year for all schools in Indonesia including SMK N 5 Yogyakarta, they have carried out face-to-face learning. To reduce worry, in accordance with government regulations for the metal craft department at SMK N 5 Yogyakarta, namely making a class change model (flipped classroom). After the pandemic in 2022, the flipped classroom model is an alternative solution to support student skills in the TEFA program. The policy is to make each class into two shifts in school. For metal class the average is 27 students, then 2 class shifts totaling 17 students in the first shift and 15 students in the second shift.

Apart from using the flipped classroom class model in the metal craft department, it also uses a block system that regulates classes in vocational high schools (SMK) that are of unusually long duration so that students can get maximum learning. So that the TEFA learning process is adapted to classes according to their areas of expertise and learning In class XI the evaluation of the process found that students were learning jewelry production using the rolling technique and the forging technique as illustrated in Figure 6. The rolling technique is used in making components that will be used in assembling jewelry products. This technique is used in the manufacture of wire, pipe, and plate by rolling or pulling. There are two ways that are used, namely rolled rolling using a rolling mill roller to make the length or width. The rolled pull is used wire or pipe by pulling it using a draw plate. The tools used in the process are shown in Figure 5 below.

Fig. 4. Rolling mill and draw plate practice tools

In the production of jewelry using the forging technique previously students were given the task of observing jewelry in jewelry shops, then drawing it in jewelry planning designs by imitating or other forms from the students' own exploration results. After that, the students brought the planning designs to school and practiced them according to the procedures for making jewelry given by the teacher.

Fig. 5. The production process of class XI jewelry metal craft TEFA using forging techniques

Making jewelry with forging techniques using solid metal materials, this technique forms the solid metal into jewelry by forging and in the form of trimmings using a file. There are several techniques in the process of its formation, such as smelting with the material together with the formation of solid metal ingots, 2) forming jewelry using forging, 3) forming together with flattening on the metal surface with a file, 4) smoothing, 5) polishing.

In other materials, class XI also produces tables and chairs made of metal using welding and metal turning techniques. The welding process is carried out manually or what is called acetylene (oxy-acetylene) welding, in which the surface to be joined is heated until it appears melted by the gas flame from acetylene using metal or without filler metal and the joining process is done without any pressure. The production process of metal welding and turning techniques can be seen in Figure 6 below.

Fig. 6. The production process of welding and turning techniques

There are several tools used by students such as oxygen cylinders, acetylene cylinders, oxygen, and acetylene regulators, lighters, welding goggles, and rubber pipes. There are several manufacturing techniques that are carried out: the first is cutting the metal to be made of jewelry, the second is shaping the metal, the third is assembling the formed metals, the fourth is the

refinement stage and the final stage is finishing. In this process, students remove rust from metal using coarse sandpaper and fine sandpaper, after that students prepare paint as a metal protector from rust by painting it or spraying it directly, but previously it was sprayed with primer first and then painted again. with evenly selected colors.

For class XII the production process has been completed in the TEFA program, unable to find results from the class XII process evaluation because Graduation Competency Test has already been held in the TEFA program. However, for class XII TEFA products, it can be seen and discussed in the discussion of product evaluation results.

At the end of the lesson in the production process, students clean TEFA practice tools and materials by cleaning the production workshop, checking again, and rearranging the tools used according to their respective places and functions, the teacher also checks tools and materials with students. and finally closing and praying together after the production process is complete.

1.1.4. Product Evaluation

The results of the product component evaluation in the TEFA program at SMK N 5 Yogyakarta obtained the appropriate criteria, having a percentage of 69.33% with several indicators as follows:

1. Feasibility of TEFA products in the market. In evaluating the feasibility of a product, an assessment is carried out by referring to several aesthetic aspects (aesthetic value) of the product, whether the market selling value is appropriate or not with the market price, whether it has a usability value (functional) or the product is only a decorative object (object of the display), whether the product is are eye-catching or attractive in the market, and whether the materials used are in accordance with their uses and market prices or not. The results found that the product is appropriate and quite attractive in the market.
2. TEFA product performance (exhibition)/ marketing. Product performance is assessed using several aspects such as: how is the product performance visualized, what is the price of the product, if the product eye-catching, what is its aesthetic value, and what is the product's usability value. As for the overall product performance, it is in accordance with the market.
3. Entrepreneurial student independence. In the evaluation of checking students in the business world, there are several aspects of assessment such as whether the product is marketed by students themselves, and whether the product is marketed through agents/business partners. From the results obtained, the product marketing still cannot be marketed independently or through school assistance/agents.
4. The suitability of TEFA products in the industrial world (DI). For the assessment of the suitability level of products in the industry, results are in accordance with the criteria for several aspects of the assessment, such as production techniques and product results are suitable for entering industrial areas, product work is neat and according to procedures in the industrial sector, and products are included in industrial criteria.
5. In the product or output components of the TEFA program, the program learning achievement results are similar to the product results in Figure 8. From the results obtained, it is found that the average rating of teachers with a vulnerable score of 78 from each class of metal craft majors with a total of around 162 students. These results indicate that the process of implementing the TEFA program is quite effective and in accordance with the goals and benefits of TEFA itself.

Fig. 7. TEFA product results

In the final semester of the TEFA program, a class exhibition was held. The picture below is an exhibition for class XII because the TEFA learning process has been completed and students are required to be able to publish their work in an exhibition. The exhibition has a list of price quotations for the products displayed. From the average class XII exhibition results, most students chose to display their work on crafts that function as room decorations (wall displays) and jewelry such as rings and brooches. Exhibitions have not been held in classes X and XI because learning has not been completed this semester, but the products that have been produced are shown in Figure 8. Various products are produced, such as 1) products from decorations such as wall displays, calligraphy, sculptures in the form of metal, and trophies, 2) products from craft jewelry such as various models of rings, brooches, clothes pins, and hangers-on necklaces, key chains, and pins 3) products from welding and turning such as chairs, tables, shelves on flower pots, and room decoration. An overview of the atmosphere of the exhibition that has been conducted by class XII can be seen in the following figure.

Fig.8. Exhibition of class XII TEFA products

Organizing exhibitions as a final assessment of learning competency results. This assessment also applies to grades X and XI. Later, after the learning process is complete, an exhibition will be held for the publication of works and the final assessment. In classes X and XI the exhibition will be held after the completion of the TEFA program.

1.2. Obstacles and efforts to increase the implementation of the TEFA (Teaching Factory) program

In evaluating the implementation of the teaching factory program (TEFA) learning at SMK N 5 Yogyakarta found several obstacles that had been overcome and efforts made by teachers to realize the program so that it was in line with TEFA objectives, as follows:

1. Uneven digital technology capabilities.

During the transitional period after the COVID-19 pandemic, learning requires face-to-face learning using the flipped classroom model and some classes still use online. One of the biggest obstacles is the uneven ability of digital technology owned by students and some students have difficulty following it. One of the efforts made by the teacher is to form study groups, then for assignments that are in the form of written reports or practicums, assessments are carried out by the school by submitting assignments for each individual according to the schedule and place determined by the teacher by complying with health protocol standards.

2. Difficulties in TEFA practicum.

TEFA learning is learning that is closer to practice in the industrial world, in fact, it is still quite difficult for students in the post-pandemic period to do practicums due to the unavailability of supporting practice tools. The metal craft teacher works around this by providing practice with techniques that are easy for students to work on, such as the metal craft *sodhet* technique with decorative forms. Each of each study group representative.

3. Lack of motivation to study during the post-pandemic transition period.

During the post-pandemic transitional period, learning using the flipped classroom model with a limited number of students per class resulted in some students losing their motivation to study at school, due to the habit of learning online which is more practical and more relaxing at home without having to leave the house, so that some students have a flipped schedule. classroom study group did not come. The lack of motivation for some unscrupulous students in each grade class is a challenge for teachers to able to realize an appropriate program. Therefore the teacher visits students and motivates students and their parents to support the achievement of competent student graduates. So that students can come and keep following the implementation.

4. The ability of metal crafts techniques is not the same.

Every student in a metal arts class does not have equally competent skills. Some students experience delays in product implementation due to many factors and products that are not in accordance with TEFA assessment standards adapted to DU/DI. Therefore the teacher provides space for consultation outside of learning hours to be able to increase students' production abilities. Besides that, the teacher also provides a remedial evaluation program for students who want to improve the product so that it is in accordance with the standards and KKM.

CONCLUSION

Evaluation of the implementation of the Metal Craft TEFA (Teaching Factory) program at SMK N 5 Yogyakarta using the CIPP model obtained criteria according to an average percentage of 78.77% of the context, input, process, and product components. The implementation of the teaching factory program is appropriate and close to the goals of the TEFA program which is close to practicum in the industrial world (DI), but for practicum in the application of TEFA in the business world (DU) to be able to foster an entrepreneurial spirit still needs to be improved. Several obstacles and efforts in improving the implementation of the TEFA (Teaching Factory) program at SMK N 5 Yogyakarta are also appropriate and there is a need to increase motivation in the abilities of students in the metal craft arts major.

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