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Evaluation of teaching factory in collaboration with PT. Telkom for the adaptability development of vocational school students ICT expertise program using CIPP

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Abstract. This study aims to combine business ideas with vocational or vocational education that is commensurate with the competence of ICT expertise, the process of implementing the Teaching Fac—teaching). Teaching Factory (TEFA) which is implemented using the concept of Context, Input, Process, and Product. The approach used in this research is qualitative which is supported by quantitative data by solving case studies. The results of the research in the evaluation of the Teaching Factory (TEFA) showed that the implementation of the Teaching Factory at SMKN 1 Boyolangu Tulungagung using the CIPP model resulted in 89% being very in line with the criteria, but the thing to note from this assessment is that adjustments are needed to the main teacher competencies in the implementation of Teaching Factory. (TEFA).

Keywords. Teaching factory, Adaptability, CIPP

Preliminary

The comments submitted by users of educational institution graduates or fresh graduates are mostly related to the competencies possessed by students of educational institutions who are not ready to compete in the world of work. Most complain that their competencies are not following the majors taken, the world of work must repeat the way of working first to graduates. Educational knowledge taken for 3 years cannot be used in doing work when graduates enter and engage in the world of work. Costs and time will be incurred for graduate users during the graduate adaptation period, such as holding training. This has become an in-depth discussion for educational institutions to equip graduates with competencies that can be absorbed by the world of work as outlined and realized in the realization of Teaching Factory (TEFA). The current industrial era 4.0 is an impetus for educational institutions in equipping graduates with competencies that can be competed and absorbed by the world of work and primarily understands digitalization (Sanders, Elang Eswaran, and Wulfsberg 2016; Santos et al. 2017; Schalock et al. 2018).

The existence of a Teaching Factory (TEFA) is used in vocational learning to improve competence and prepare supplies for graduates in the world of work, so learning is made based on the world of work which is a solution to problems that afflict graduates' competencies. Reflecting on vocational learning activities which are only limited to practice by not thinking about the selling value of the output produced from practical employees of vocational students

(Kemdikbud 2019). The activities of SMK students who can realize goods or services with selling value make potential development for SMK in managing cost sources as well as a means of learning. Vocational students who have graduated have been provided with skills so that they can easily adapt to the work environment (Djatkiko 2013). Vocational high school students who are candidates for the workforce who are ready to work must be balanced with good school governance, as well as other supporters who can provide an injection of enthusiasm and increase the competence of vocational students who have bargaining power. If this is the case, then the existence of an industry that functions as an absorber of labor provides a great opportunity for the absorption of SMK graduates with undoubted SMK quality (Arikunto 2014).

Evaluation is included in activities that collect data to be used as information related to the program to measure the extent to which the implementation of the program is under predetermined achievements (Firdaus 2013; Kukuh 2017). Another thing that affects the holding of evaluations is as an indicator of performance improvement, improvement, to what things need to be maintained to implement the program based on the data obtained when conducting the evaluation (Fjaryati 2012). Various evaluation models can be used such as the goal-oriented evaluation model, goal-free evaluation model, formative summative evaluation model, consideration description, CSE-UCLA evaluation model, CIPP evaluation model, gap evaluation model (Arikunto 2009). Wakhinuddin conveyed that the CIPP model contained a formulation in a comprehensive evaluation for each stage which included context, input, the process to output included in the results (Wakhinuddin 2009). Giving value using the CIPP model provides support in the decision-making stage that has many solution options (Mahardini 2020).

The existence of a production unit that runs in SMK is used as a means of supporting learning for SMK students who practice in the world of work activities. But on the other hand, the implementation of learning in Vocational Schools is focused on the outputs produced by students with the aim of outputs that have a selling value, so that when the results are thrown at the community they will be recognized and have selling power. This result will be a matter of pride for SMK students to be enthusiastic in working with results that are appreciated by the community and sell well in the market.

The results of observations made at SMKN 1 Boyolangu which is one of the schools that has implemented Teaching Factory (TEFA) in Kab. Tulungagung. The production unit at SMKN 1 Boyolangu consists of 11 departments that use the Teaching Factory Program (TEFA). The implementation in the production unit carried out by students is considered not to be carried out properly and not following the achievement of the goals that have been set. This has been anticipated by making a schedule that is not monotonous in vocational learning, but the evaluation results show that the implementation of the production unit is less than optimal, causing graduates to be unable to work with the demands of the world of work that requires the skills of SMK graduates under their fields.

This study aims to equate business ideas and vocational education students based on abilities that are appropriate to the field in the Teaching Factory (TEFA) process. Explanations related to the implementation of Teaching Factory (TEFA) include aspects of Context or content, Input or input, Process, and Product or results.

Literature Review

Teaching Factory (TEFA)

Teaching Factory (TEFA) is used in learning in Vocational Schools based on products or services that have criteria or standards that are adjusted to procedures and carried out with location models and equipment that resembles industry. As is the case in China and Africa in

terms of educational partnerships that prioritize cooperation in all education sectors for the progress of the two countries (Niu 2014). Characteristics in vocational education as mentioned by (Arinkerhoff 1983) are: (1) preparation of students in the world of work; (2) based on the needs of the “Center of Excellence” industry; (3) ability in the field occupied; (4) students are successful in their work; (5) the industry has a close relationship or relationship; (6) literacy on the advancement of technology; (7) hands-on experience and learning by doing; (8) higher tuition fees than other public school students' fees.

Teaching Factory (TEFA) learning focuses on intersecting industry and academics by providing an approach to curriculum, training, and teaching. The following explanation is presented in Figure 2.1.

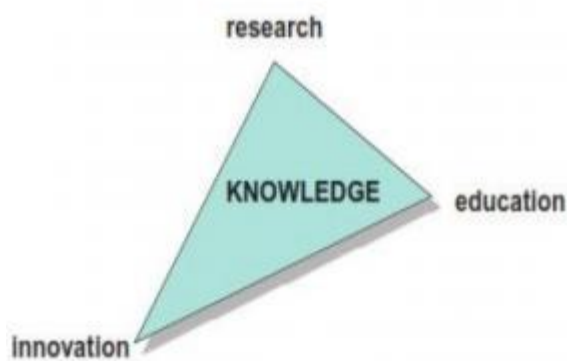


Figure 2.1. The Knowledge Triangle in Industry

Teaching Factory (TEFA) learning is carried out with the hope that graduates who are competent in their majors will be able to be absorbed in the work industry. The absorption of graduates in the work industry is inversely proportional to the need for work every year, so this creates a demand that is greater than supply. The biggest problem faced by vocational education is mainly about the achievement of graduates who have competence so that they can be absorbed by the world of work easily and quickly. This will show the quality of graduates can be maintained and able to compete.

Evaluation

Evaluation is included in the activity of collecting data which is then used as an evaluation related to the running of activity until there is a solution to the problems that occur in decision-making based on the results of the evaluation (Arikunto 2014). The definition of evaluation can also be said as a process of collecting and analyzing data into information in the form of values based on the findings of evidence during the evolutionary process. The basis for the assessment depends on the achievements and the results of the decisions used to help resolve the problem or not (Gandhari and Akarte 2020). Another opinion is related to evaluation which means that evaluation is included in the program that is carried out to provide value for the activities carried out by the objectives of the achievement or far from the achievement, as well as what things must be done to improve future activities to be better (Sukardi 2008). Evaluation is also useful for showing performance that must be improved and must be maintained.

CIPP Evaluation Model

The CIPP model is included in the model that is often used by evaluators (Belinski et al. 2020). This model explains that evaluation is used to convey a basis that contains accurate and objective information in making decisions. Madaus, Scriven, and Stufflebeam (Widoyoko

2009) state that "the cipp approach is based on the view the most important purpose of evaluation is not to prove but to improve". The CIPP model or known as Context, Input, Process, and Product, the following is an explanation related to each of these aspects:

a. Context evaluation

Context is defined as activities carried out based on conditions that affect educational goals and strategies in developing learning programs that have been formulated (Rentzos, Mavrikios, and Chryssolouris 2015; Stufflebeam 2007) describing context evaluation, as follows:

"context evaluation assess needs, problems, assets and opportunities to help decision makers define goals and priorities and to help relevant user judge goals, priorities, and outcomes". Context evaluation is meaningful in assessing needs, assets, problems as well as opportunities in helping policymakers to set key goals, and providing assistance to other user groups understanding goals, opportunities, and outcomes. The results of the evaluation of the context as an overview, details of the environment and provide an assessment of the achievement of targeted goals.

b. Input evaluation

Input evaluation is an evaluation that aims to provide information to determine how to use the available resources in achieving program objectives. Evaluation of inputs assists in managing resources, decisions, solutions, and strategies in achieving goals (Sukardi 2008; Wagner et al. 2015). The input evaluation includes: 1) the presence of human resources, 2) supporting infrastructure, 3) financing, and 4) the rules that have been set.

c. Process evaluation

The process evaluation has the aim of detecting the design procedures in implementing and providing information in decision making and also documenting the procedures that have been running (Widoyoko 2009). The basis of process evaluation is to provide knowledge in future designs that must be improved.

d. Product evaluation

Product evaluation is the end of the CIPP model. The purpose of this evaluation is to interpret and also measure the achievements of the programs that have been carried out. In product evaluation, provides instructions for incoming changes and provides value when measuring the results of achievements (Widoyoko 2009). Another result of this evaluation can be known as the next step of the program to be given changes, repaired, or terminated.

Research methods

This research is categorized as evaluation research. The approach used is a mixed method which is a combination of qualitative with quantitative support, in addition, case studies are the method in this research. Evaluation research using the CIPP model was originally developed by daniel Stufflebeam and re-examined in this study. The selection of the CIPP evaluation model is based on its comprehensive characteristics, including context, input, process, and product. This research was conducted at SMKN 1 Boyolangu Tulungagung.

The instruments used in this study were interview guidelines, observation instruments, and evaluation instruments for the implementation of the Teaching Factory (TEFA) learning program.

CIPP Evaluation Instrument

No	Variable	Indicator
1	Context	a. The objectives of the Teaching Factory program Benefits of the Teaching Factory program b. Criteria for participants of the Teaching Factory program c. The suitability of the implementation of the Teaching Factory with the business world and the industrial world d. The feasibility of Teaching Factory's products on the market e. Product performance from Teaching Factory f. The suitability of Teaching Factory products in the industrial world
2	Input	a. Human resources in the Teaching Factory in SMK b. Financial administration in Teaching Factory
3	Process	a. Management of Teaching Factory Implementation in Vocational High Schools Teacher handling of product problems b. Setting the time, space, equipment for the implementation of the Teaching Factory c. Student attendance in Teaching Factory learning d. Implementation of Quality Control (QC) e. Teacher's ability in managing teaching factory learning activities
4	Product	a. The feasibility of Teaching Factory's products on the market b. Product performance from Teaching Factory c. The suitability of Teaching Factory products in the industrial world

Research Results and Discussion

The results obtained from interviews and observations conducted at SMKN 1 Boyolangu Tulungagung implemented the Teaching Factory (TEFA) by grouping respondent data into the CIPP Teaching Factory evaluation instrument table according to the indicators and variables used. The data analysis used was a descriptive percentage system and obtained the following results:

1. On the indicators of the benefits of the Teaching Factory program, the suitability of the implementation of the Teaching Factory with the Business and Industrial World (DUDI), the criteria for the participants of the Teaching Factory program, and the objectives of the Teaching Factory program the context variable gets a percentage of 100%.

2. The input variable indicators which include human resources in the Teaching Factory and financial administration in the Teaching Factory each have a percentage of 92% and 89%.

3. The percentage of process variable indicators which include indicators of teacher ability in managing Teaching Factory learning activities, indicators of student attendance in Teaching Factory learning, and the implementation of quality control (QC), each of which is 100% and for other indicators such as indicators of teacher handling of 67% of product problems that are ready to be implemented, indicators of setting time, space and

equipment for the implementation of Teaching Factory by 92% and indicators of managing the implementation of Teaching Factory by 89%.

4. The percentage of product variable indicators includes the suitability indicator for Teaching Factory products in the interactive industrial world, 83%, Teaching Factory product indicators in the market 100%, and Teaching Factory product performance indicators 67%.

Based on the results of the evaluation of the context variables of the Teaching Factory implementation at SMKN 1 Boyolangu Tulungagung, it shows that the criteria it has are appropriate. Following Government Regulation No. 29 of 1990 article 29 paragraph 2 which regulates the entire implementation of Teaching Factory which is based on a legal program regarding Teaching Factory which states that "To prepare vocational high school students to become workers, at vocational high schools can be established production units that operate in a professional manner" and to improve the competitiveness and quality of human resources in Indonesia, it is regulated in presidential instruction number 9 of 2016 concerning the revitalization of vocational schools. The community has a positive view of the Teaching Factory program in terms of its benefits and objectives. Acceptance and support of several partner industries at the DKI Jakarta State Vocational School regarding the suitability of the Teaching Factory with the Business and Industrial World (DUDI). To develop and foster the entrepreneurial spirit of students, parents and the community also support the implementation of the Teaching Factory program. Thus it can be shown by the implementation of the Teaching Factory program at SMKN 1 Boyolangu Tulungagung according to the content variable.

Based on the information obtained from the results of the evaluation of the input variables, not all teachers can implement the Teaching Factory program, facilities and teacher motivation are the contributing factors. On the other hand, the understanding and ability of teacher productivity in the field of study affect the implementation of the Teaching Factory. Some SMKs have budgets that have been prepared by accounting procedures and some do not yet have school budgets regarding financial administration. The proof of transactions used in accountability to schools during the implementation of the Teaching factory program is the recording of financial statement transactions and daily transactions. Based on the results of the study, it obtained very suitable results from the criteria indicated by the implementation of the Teaching Factory program.

Based on the results of the process evaluation of the Teaching Factory management that occurred at SMK 1 Boyolangu Tulungagung following the planning, supervision, and implementation of the Teaching Factory implementation program. Even though the Teaching Factory program planning is not completely complete, it must be included in the planning document. Teachers play an active role in assisting students during the implementation of the Teaching Factory program. The school's internal stakeholders are involved in supervising the service/production results. So that the criteria obtained by the process variable in the implementation of the Teaching Factory program at SMKN 1 Boyolangu Tulungagung.

Based on the results of the product evaluation, some schools are still pioneering Teaching Factory products to compete in the global market and those that already have competitiveness with existing products. On the other hand, Teaching Factory also offers quality products to the industrial world such as automotive, marketing, multimedia, and others. Through students' skills in competent expertise, they produce Teaching Factory products that are under what is needed by the industrial world and some schools are not yet appropriate because they are still in the process of running the Teaching Factory program. If the results of the Teaching Factory are the same as what is needed in the industrial world and are also able to

compete with other products, it can be said that the results of the Teaching Factory are said to be successful.

The results of the program evaluation from the Teaching Factory using CIPP were presented with a result of 89% with a note that there were adjustments in the implementation of the Teaching Factory at SMKN 1 Boyolangu Tulungagung.

Conclusion

Evaluation of the implementation of the Teaching Factory policy program at SMKN 1 Boyolangu Tulungagung with the CIPP model obtained 89% results with a note that there were adjustments in the implementation of Teaching Factory at SMKN 1 Boyolangu Tulungagung. Implementation of Teaching Factory needs to be adjusted in schools such as teachers having the appropriate abilities in their fields in running a Teaching Factory, the organizational structure of the Teaching Factory which was inaugurated with ratification documents and products that can compete with the industrial world. So that the purpose of Teaching Factory can run so that it can prepare students to become workers and continue their studies.

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