Lectura: Jurnal Pendidikan
Volume 14, Nomor 2, Agustus 2023, Halaman 388-407
P-ISSN: 2086-4876
E-ISSN: 2549-063X
DOI: https://doi.org/10.31849/lectura.v14i2.15085
Link: https://journal.unilak.ac.id/index.php/lectura/article/view/15085

Goal Oriented Evaluation Using the Delphi Method in Implementing Teaching Factory Multimedia

Lisna Nurrohmawati
Universitas Negeri Jakarta
E-mail: lisnanurrohmawati71@guru.smk.belajar.id

Yuliatri Sastrawijaya
Universitas Negeri Jakarta
E-mail: yuliatri@unj.ac.id

Efri Sandi
Universitas Negeri Jakarta
E-mail: efri.sandi@unj.ac.id

Submitted: 10-07-2023 Accepted: 21-07-2023 Published: 01-08-2023

Abstract
Contextual vocational education makes students able to link the skills acquired with their application in the real world so they will have appropriate competencies. Learning with teaching factory has a focus point, namely the application of competency-based learning patterns supported by production-based learning with link and match between vocational high schools and industry. This research was a mixed method research. This study used the goal oriented program evaluation model with Delphi method to obtain the opinion of experts to determine the standard of assessment that has been used to measure the implementation of teaching factory. The Delphi method used panelist discussions of experts from the multimedia industry and national teaching factory sources. The goal oriented evaluation model was used to measure program achievement based on the objectives of the teaching factory program applied to the *Sekolah Menengah Kejuruan* (SMK) level. The research was conducted at SMK that hold multimedia expertise competencies in Bogor Regency. The types of research instruments used were observation, interviews, and questionnaires. Validity test with Lawshe technique and reliability test using Chronbach Alpha. The research sample consisted of eleven schools with an average overall result in Bogor Regency was 82.23. Based on these values, it can be concluded that the implementation of the teaching factory in Bogor Regency is well implemented.

Keywords: teaching factory, competency, link and match

INTRODUCTION

Vocational education in Indonesia applies a dual system learning pattern. In fact, currently industrial development is very fast, therefore it is necessary to increase the competitiveness of SMK graduates. Vocational High School graduates will later become workers at the local, national and regional levels, must have competitiveness. (Khurniawan, 2016)

Several schools in Indonesia have implemented a teaching factory-based learning pattern. One of them is in the South Jakarta area. Schools function as effective teaching factories because they have sufficient practice spaces and are staffed with knowledgeable professionals in their professions (Casmudi et al., 2022). Schools with expertise in accounting management have a business center as a place for students to practice according to the world of work. There are supporting and inhibiting factors in the implementation of teaching factory (Lestari, 2014; Risnawan, 2019; Sudiyono, 2019; Yusuf & Mukhadis, 2018). One of the inhibiting factors is the lack of cooperation between schools and industry so that the marketing of student competencies and the products produced are not in accordance with industry standards (Diwangkoro & Soenarto, 2020; Rusmulyani, 2020). Furthermore, in different places, research on teaching factories in Malang City also shows that there are obstacles to implementing teaching factories due to industrial relations that are less than optimal. So that the alternative solution to this problem is to build intensive communication with the industry so that the results of implementing the teaching factory can be maximized. The hope for implementing the teaching factory is that students will have competencies according to industry needs (Purnomo et al., 2020).

The research conducted in the field of teaching factory studies is very many, each study has a goal to improve quality learning in SMK. There are some implementation procedures of manual book (Amin, 2016; Manalu et al. (2017). The combination of goal oriented evaluation models and methods of Delphi and it is hoped that it will be able to produce a reference for measuring the implementation of teaching factory. Bogor Regency as the region with the largest number of SMK in West Java Province organizes SMK with various competency skills. The number of Vocational High Schools that hold Multimedia expertise competence is 35. Until now, the implementation of the teaching factory in Bogor Regency has never been evaluated. Therefore, this study aims to find a tool that is used to evaluate the application of teaching factory-based learning that is implemented in Multimedia competency competency vocational schools in the Bogor Regency area using the goal-oriented evaluation model and the Delphi method.

Some previous researcher had done findings about teaching factory. Rizky et al. (2018) teaching Factory-based learning is also implemented in various sources. One of them is Nanyang Polytechnic International Singapore, which also organizes teaching factory-based education. The education that is carried out is education that has integration between the world of education and the world of industry. With this integration, it creates a problem-solving mindset in accordance with the real world context (Rizky et al. 2018). In line with this, the research of Makhbubah (2020) also suggests facts that support integration between industry and the world of education. The implementation of teaching factories at the University of Patras by carrying out the concept of factory to classroom and lab to factory, namely the existence of transferring skills from industry to educational institutions (Mourtzis et al., 2021).

METHOD

The research was conducted using the mixed method type, namely a combination of qualitative and quantitative. The program evaluation model used in this study is a goal oriented evaluation model (Stufflebeam & Zhang, 2017). According to Ralph W Tyler, goal oriented has stages consisting of setting general goals, grouping targets, determining situations for achieving goals, developing assessment methods, collecting data and then comparing data with characters that match the goals (Novalinda et al., 2020). Based on the concept presented by Tyler, it can be concluded that the use of a goal-oriented evaluation model is devoted to obtaining measurements by comparison based on predetermined goals (Stufflebeam & Coryn, 2014). In the research conducted, goal oriented will be carried out in five technical processes namely developing evaluation objectives, composing instrument, share instrument, data analysis, giving advice recommendation result. In developing evaluation objectives step, it is about determining formulated goals and classifying objectives. In composing instrument step, it is about formulating goals on measurable behavior, determining the time, and select and develop method. In share instrument step, it is about collecting data. In data analysis method, it is about comparing performance data with objectives. In giving advice recommendation result, it is about the measurement results used as an evaluation of each skill competence to make improvement. In the research, goal oriented evaluation model will be seen in the following Figure of the stages in the goal-oriented evaluation model.

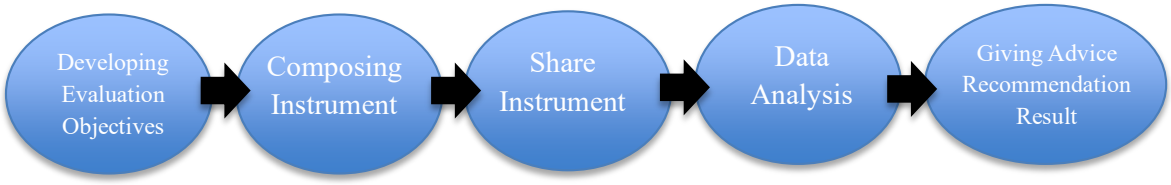

Figure 1. Goal-Oriented Evaluation Model Step

Developing Evaluation Objectives

The standard for evaluating program evaluation in this study is based on the teaching factory governance guidelines from the Ministry of Education and Culture (Manalu et al., 2017; Amin, 2016). The parameter of the standard is Management, Workshop or Laboratory, Learning Pattern, Marketing Promotion, Product and Service, Human Resources, and Industrial Relation. Every parameter, is have several specific sub parameter in accordance with the Evaluation criteria for the Teaching Factory program from Governance of Teaching Factory Implementation (Khurniawan, 2016).

Table 1. Evaluation Criteria for the Teaching Factory Program

Parameter	Management	Workshop or Laboratory	Learning Pattern	Marketing Promotion	Product and Service	Human Resources	Industrial Relation
Sub Parameter	• Financial administration • Organizational structure and job description • Standard operational procedure (SOP) performance and workflow	• Equipment • Governance of tool use • Room • Management Maintenance, repair, & Calibration (MRC) • layout workshop • Application of K3	• Learning Implementation Plan and jobsheet • Practice material • Practice base • Implementation of training • Entrepreneurship • Teacher/instructor activities • g. Based on corporate culture	• Marketing & promotion plan • Communication media for Teaching Factory • Brochures/ leaflets/ website • Mockup/ product samples/ models • Market reach • Person responsible	• Products for internal needs • Market acceptability • Delivery • Quality • Quality control • Product innovation/diversification	• TF competence • The number and suitability of human resources to run the Teaching Factory • Motivation • Innovation • Team work • Training for internal personnel	• Project work • Technology transfer • Investment by industry

The expert panelist discussion was held on May 3, 2023, in the discussion conducted, the first expertise stated that teaching factory learning is learning that brings industrial work systems to school. The work system in question is the production process of both products and services whose procedures are in accordance with what is done by the industry.

This opinion was approved by the second expertise who stated that the project work was carried out in accordance with industry standards while at the same time providing real experience in accordance with the conditions in the industry when students later work. In the multimedia field, which is part of the informatics skills program, students must be able to work like in an industry with multitasking work patterns or at one time must be able to do several jobs at once.

This opinion was further strengthened by the submission of the third expertise who stated that in teaching factory based learning activities in schools, the tools used must be close to industry standards. Quality control for teaching factory activities in schools is the head of multimedia expertise competence. In order for learning activities to be in accordance with the teaching factory principle, it is necessary to apply a block schedule.

Furthermore, the fourth expertise stated that in addition to the quality of the product that needs to be maintained, it is also necessary to have soft skills in accordance with the demands of the industry that are owned by students who must continue to be developed and students must also be able to work in teams. After the discussion was carried out, direct interviews were carried out with the expert panelists. Furthermore, the opinions of each of these experts are summarized to be used as a mutually agreed upon teaching factory assessment standard. The results of the expert panelist discussion show that the teaching factory assessment standards apart from the Teaching Factory Governance Guidelines from the Ministry of Education and Culture, are also adjusted to the needs of the world of work in their field.

Composing Instrument

The instruments are arranged based on the grid that has been described in the previous chapter, namely the instrument consists of three types which include observation

instruments, interview instruments, and questionnaire instruments. The following is the instrument grid.

Observation instrument

Table 2. Observation Instrument Grid

No	Indicator	Description
1.	Workshop or Laboratory	Observation of the condition of the practice room used in learning activities.
2.	Learning patterns	Observation of learning patterns carried out by the teacher to students.
3.	Human resources	Observation of the availability of existing human resources in competency skills.
4.	Product and service	Observation on the results of products and services in teaching factory practice activities.

Interview instrument

Table 3. Interview Instrument Grid

No	**Indicator**	**Description**
1.	Management	Organizational structure, jobdesk, performance standard operational procedure, transaction reports
2.	Marketing	Clarity of targets, market segments
3.	Industrial relation	Collaboration that has been established in the industry

Questionnaire instrument

Table 4. Questionnaire Instrument Grid

No	**Field**	**Parameter**
1.	Management Supervision	Management Marketing Industrial relation
2.	Learning Process	Workshop or Laboratory Learning patterns Human resources Product and service
3.	Result	Competency

The results of validity testing using the Lawshe technique and the reliability testing using the Chronbach Alpha technique. The results of validity testing using the Lawshe technique with expert validators, namely Shinta Kurnia Dewi, M.Pd, Yus Hariadi, S.Kom, M.Pd, and Nurhayat Candra K, S.ST, M.Kom, showed that the observation instrument obtained a value of 0.87 which it means valid. The interview instrument obtained a value of 0.90 which means it is valid, and the questionnaire instrument obtained a value of 0.84 which means it is valid. Then the validity test was carried out with Chronbach Alpha showing the result that the observation instrument obtained a value of 0.7052, which means reliable. The interview instrument obtained a value of 0.7099 which means reliable, and the questionnaire instrument obtained a value of 0.9672 which means reliable.

Data Analysis

Analysis of the qualitative data obtained from the Delphi method adapted from Hasson et al. (2011) was then made into an instrument for assessing the application of the teaching factory. From each of these schools, the achievement value was obtained from

the application of the teaching factory. Achievement scores have been obtained from each field, so that these values can be used by schools. The rating scale used to assess is in accordance with the governance of the teaching factory from the Ministry of Education and Culture (Manalu et al., 2017; Amin, 2016) and expert panelist discussions conducted using the Delphi method, the rating range used is 90-100 : very good, 80-89 : good, 70-79 : enough, 60-69: less, and <60 : very less.

FINDINGS AND DISCUSSION

Findings

The findings of data collection from sample schools were then analyzed using data analysis techniques for quantitative data. The measurement results has been presented in the form of descriptive statistical analysis. Data was presented using descriptive tables and bar charts. Following are the results of data collection from each sample school.

Table 5. The Result from Each School

No	Aspect of Teaching Factory	Total Result
1.	SMKN 1 Cibinong	87.47
2.	SMKS 2 Triple J	85.04
3.	SMKS Insan Kreatif	81.07
4.	SMKS PGRI 2 Cibinong	79.14
5.	SMKS Amalian Ciawi	83.53
6.	SMKS Dewantara	83.87
7.	SMKS Taruna Terpadu 1	81.53
8.	SMKS Generasi Madani	78.74
9.	SMKS Metland School	81.79
10.	SMKN 1 Bojonggede	84.13
11.	SMKS Pelita Nusantara	78.26
	Average	**82.23**

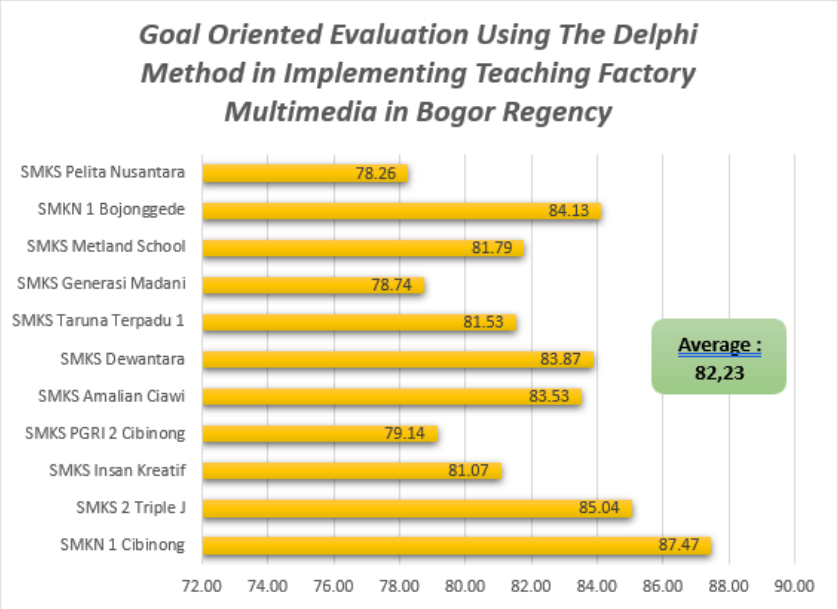

Figure 2. Visualization of Research Results at Bogor Regency

Based on the Table 5 and Figure 2, the result is that the application of teaching factory with the highest score is SMKN 1 Cibinong. Next, Triple J 2nd Vocational School, then Bojonggede 1st Vocational School, Dewantara Vocational School, Amaliah Ciawi Vocational School, Metland School Vocational School, Integrated Youth Vocational School 1, Creative Insan Vocational School, Cibinong PGRI 2 Vocational School, Generation Madani Vocational School, and finally, the Pelita Nusantara Vocational School. The achievement of each of these schools is then calculated on average to obtain the value of the teaching factory implementation at SMKs that organize multimedia expertise competencies in Bogor Regency. The average calculation result is 82.23 which means good. This calculation result means that it is good as efficient teaching factory, students' successful, and the quality of teaching. It is in line with the statement from Casmudi et al. (2022) that due to their extensive practicing areas and staff of competent specialists in various fields, schools serve as efficient teaching factories. It is also in line with Rizky et al. (2018) that most of students' got successful since there is a support from industry by teaching factory. Then form the quality of teaching, the support statement is from Rismawan, (2019) & Sudiyono (2019) stated that the teaching quality getting increase by managing teaching factory at vocational school.

Discussion

SMKN 1 Cibinong

The total value of achieving the teaching factory implementation is 87.47 which means good. In the field of management, the score is 86.67 with a good description. In the field of marketing, 86.67 is of good value, meaning that they have been able to do marketing well. In the field of industrial relations it is 86.25 with good value, meaning that the industrial relations department is able to establish continuous cooperation with industrial partners. In the field of practice room it is 86.92 with good value, meaning that the supporting facilities in the practice room are suitable for teaching factory activities.

In the field of learning patterns, it is 88.33 which is of good value because the application of the block schedule can be applied, namely blocks every two weeks. In the field of Human Resources (HR) it is 88.44. In the field of products and services, it is 88.44 with good value because the products from the teaching factory are directly monitored by partner industries, namely PT. Indocement Tunggal Prakarsa Tbk and the head of multimedia expertise competence and in the field of competence is 88.00 good and these competencies are maintained with various products made at the business center and participating in various student competency competitions. The results of the data obtained from SMKN 1 Cibinong are then modeled visually with table and radar chart as follows.

Table 6. Assessment Results at SMKN 1 Cibinong

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	86,67	86,67	86,25	86,92	88,33	88,44	88,44	88,00	87,47

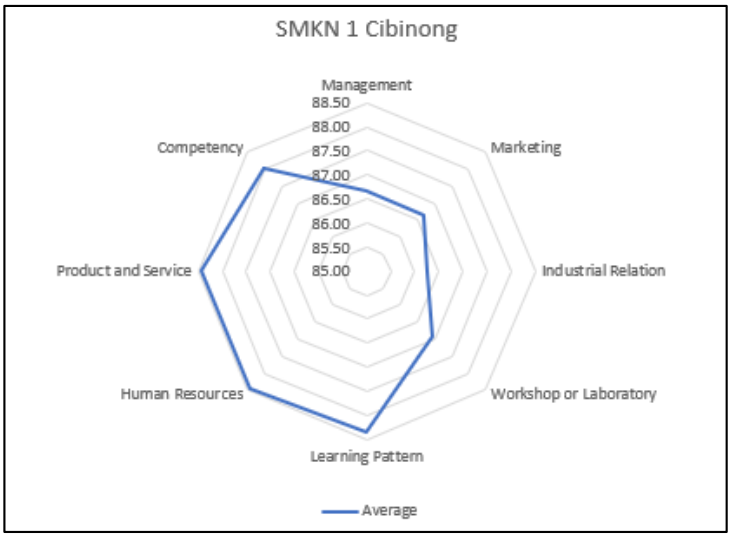

Figure 3. Visualization of Research Results at SMKN 1 Cibinong

SMKS 2 Triple J

The total value of teaching factory implementation is 85.04 which means good. In the field of management, the score is 80.00 which means good. In the field of marketing, it is 81.67 which means good, because it gets continuous orders from PT. Astra Graphia Tbk, then in the field of industrial relations is 88.75 which means good because industrial relations are well established with partner industries.

In the field of practical space, it is 84.49, which means it is good because the equipment is supported by the partner industry. In the field of learning patterns it is 85.00 which means good because industry standards are applied to the learning process. In the field of Human Resources (HR) it is 87.22, then in the field of products and services it is 89.22 which means good because products are directly used by partner industries and lastly in the field of competence is 84.00 which means good. The results of the data obtained from SMKS 2 Triple J are then modeled visually with table and radar chart as follows.

Table 7. Assessment Results at SMKS 2 Triple J

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	80,00	81,67	88,75	84,49	85,00	87,22	89,22	84,00	85,04

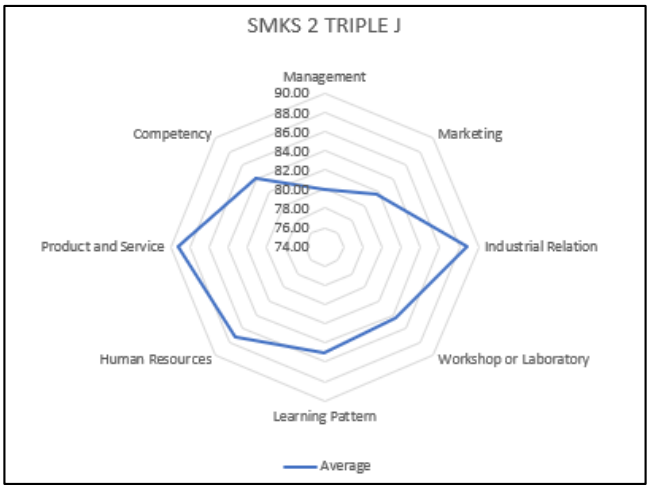

Figure 4. Visualization of Research Results at SMKS 2 Triple J

SMKS Insan Kreatif

The total value of teaching factory implementation is 81.07 which means good. In the field of management, the score is 80.00, which means it is good, however, it still needs to be strengthened in the organizational structure. In the field of marketing, it is 81.67 which means good. In the field of industrial relations it is 81.67 which means good. Furthermore, in the field of practical space it is 80.26 which means good, the facilities owned are suitable for the practical needs of students. In the field of learning patterns, it is 81.67 which means good, the learning tools are in accordance with the needs of teaching factory-based learning.

In the field of Human Resources (HR) it is 81.67 which means good. In the field of products and services it is 81.67, which mean is good. In the field of competence, it is 80.00. The results of the data obtained from Creative Insan SMKS are then modeled visually with table and radar chart as follows.

Table 8. Assessment Results at SMKS Insan Kreatif

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	80,00	81,67	81.67	80.26	81.67	81.67	81.67	80,00	81,07

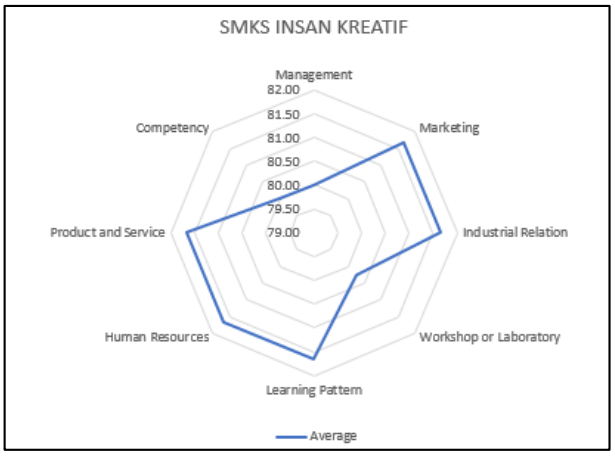

Figure 5. Visualization of Research Results at SMKS Insan Kreatif

SMKS PGRI 2 Cibinong

The total value of implementing the teaching factory is 79.14 which means it is enough. In the field of management, the score is 73.33, which means that it is enough. In the field of marketing, it is 73.33, which means that it is enough, it should be improved so that the marketing of teaching factory products will be even better. In the field of industrial relations it is 81.67 which means good.

In the field of practical space, it is 80.64 which means good. In of learning patterns it is 80.00, meaning that the learning is carried out according to industry standards even though it has not been able to apply the block schedule system. In the field of Human Resources (HR) it is 79.67 which means it is enough. The thing that needs attention is that existing Human Resources (HR) can take part in teacher apprenticeship programs in industry. In the field of products and services it is 84.44 which means good and in the field of competence it is 80.00 which means good. The results of the data obtained from SMKS PGRI 2 Cibinong are then modeled visually with table and radar chart as follows.

Table 9. Assessment Results at SMKS PGRI 2 Cibinong

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	73,33	73,33	81,67	80,64	80,00	79,67	84,44	80,00	79,14

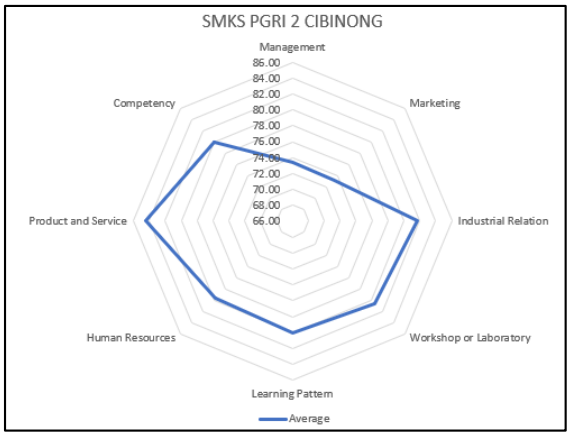

Figure 6. Visualization of Research Results at SMKS PGRI 2 Cibinong

SMKS Amaliah Ciawi

The total value of teaching factory implementation is 83.53 which means good. In the field of management, the score is 80.00 which means good,. In the field of marketing, it is 81.67, which means it is good, that is, it can already take advantage of the promotional media that is owned well, then in the field of industrial relations, it is 83.75, it means it is good, it already has continuous cooperation with industry.

In the field of practical space, it is 85.26 which means good, the practice facilities are close to industry standards, especially computers with modeling and animation specifications. In the area of learning pattern is 85.00 which means good. In the field of Human Resources (HR) it is 84.89 which means good. In the field of products and services, it is 83.67 which means good. In the field of competence, it is 84.00 which means good. Student competencies are close to industry standard requirements. The results of the data obtained from SMKS Amaliah Ciawi are then modeled visually with table and radar chart as follows.

Table 10. Assessment Results at SMKS Amaliah Ciawi

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	80,00	81,67	83,75	85,26	85,00	84,89	83,67	84,00	83,53

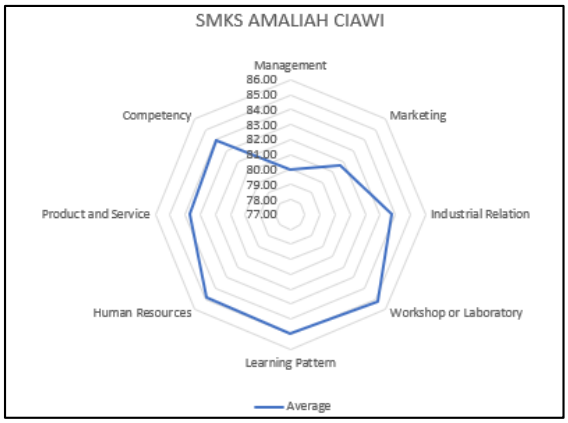

Figure 7. Visualization of Research Results at SMKS Amaliah Ciawi

SMKS Dewantara

The total value of teaching factory implementation is 83.87 which means good. In the field of management, the score is 80.00 which means good. In the field of marketing, it is 81.67 which means good. In the field of industrial relations it is 84.17 which means good, the school already has continuous product orders. In the field of practice space, it is 82.69, meaning that the practice facilities are close to industry standards. In the area of learning pattern is 88.33 which means good, has applied industrial culture to learning activities.

In the field of Human Resources (HR) it is 81.67 which means good, then in the field of products and services it is 88.44 which means good. In the field of competence, it is 84.00 which means good, student competence is maintained by having a business center and participating in various student competency competitions. The results of the data obtained from the Dewantara Vocational High School are then modeled visually with table and radar chart as follows.

Table 11. Assessment Results at SMKS Dewantara

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	80,00	81,67	84,17	82,69	88,33	81,67	88,44	84,00	83,87

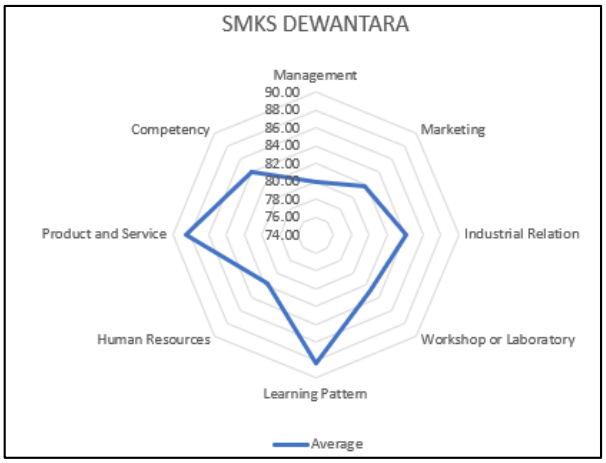

Figure 8. Visualization of Research Results at SMKS Dewantara

SMKS Taruna Terpadu 1

The total value of teaching factory implementation is 81.53 which means good. In the field of management, a score of 80.00 means good. In the field of marketing, a score of 86.67 means that the promotional media that is owned can function effectively. In the field of industrial relations, it received a score of 79.58, meaning that it is enough which later needs to be improved so that it can obtain continuous orders from the industry.

In the field of practice space, it has a value of 82.69 which means good. In learning patterns the score is 78.33 means that it is needs to be further improved. In the field of Human Resources (HR) is 77.33, it needs to take part in teacher internships in industry. In the field of products and services, a score of 83.67 means good, the products and services made are of good quality. In the field of competence, a score of 84.00 means good. The results of the data obtained from SMKS Taruna Terpadu 1 are then modeled visually with table and radar chart as follows.

Table 12. Assessment Results at SMKS Taruna Terpadu 1

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	80,00	86,67	79,58	82,69	78,33	77,33	83,67	84,00	81,53

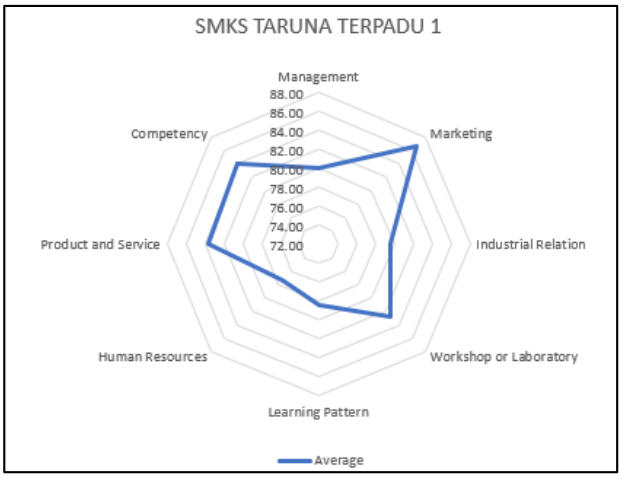

Figure 9. Visualization of Research Results at SMKS Taruna Terpadu 1

SMKS Generasi Madani

The total value of implementing the teaching factory is 78.74 which means it is enough. In the field of management, the score is 73.33, which means that it is enough. In the field of marketing, it is 73.33, meaning that it is quite hoped that the promotional media they have can be used more effectively. In the field of industrial relations, it is 79.58, which means it is enough, it can be improved by establishing cooperation with the industry so that it can place continuous orders for products.

In the field of practical space, it is 83.97 which means good. In the field of learning patterns it is 78.33 which means it is enough, it can be improved by implementing a block schedule system. In the field of Human Resources (HR) it is 85.67, which means is good. In the field of products and services it is 79.67 it can be improved further and in the field of competence it is 76.00, it can be increased again so that student competencies are close to industry standards. The results of the data obtained from the Generation Madani SMKS are then modeled visually with table and radar chart as follows.

Table 13. Assessment Results at SMKS Generasi Madani

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	73,33	73,33	79,58	83,97	78,33	85,67	79,67	76,00	78,74

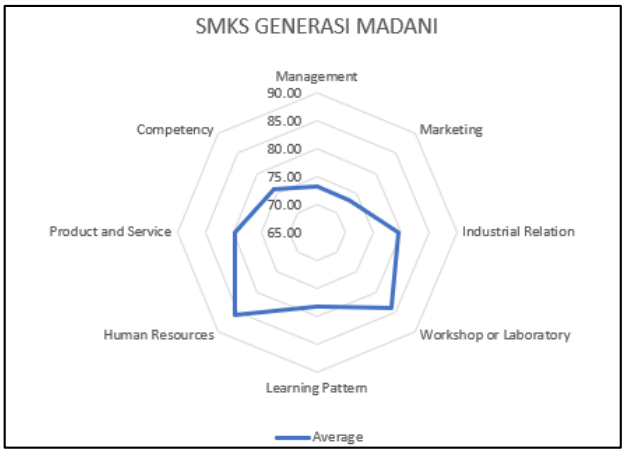

Figure 10. Visualization of Research Results at SMKS Generasi Madani

SMKS Metland School

The total value of implementing the teaching factory is 81.79 which means it is good. In the field of management, the score is 86.67 which means good because teaching factory learning activities have a good impact on schools. In the field of marketing, it is 76.67, meaning that it is quite hoped that it will be further improved so that product marketing is better. In the field of industrial relations, it is 78.75, which means it is enough.

In the field of practical space is 83.59 which means good. In the area of learning pattern is 83.33 which means good, the application of industrial culture has been carried out. In the field of Human Resources (HR) it is 81.67 which means good, because the Human Resources (HR) who teach come directly from industry. In the field of products and services it is 79.67 and in the field of competence it is 84.00 which means good. The results of the data obtained from the Metland School SMKS are then visually modeled with table and radar chart as follows.

Table 14. Assessment Results at SMKS Metland School

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	86,67	76,67	78,75	83,97	83,33	81,67	79,67	84,00	81,79

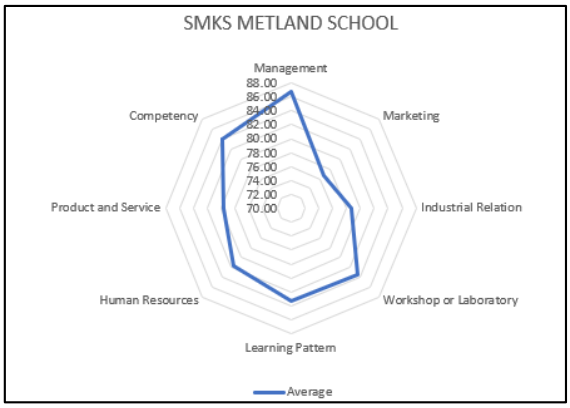

Figure 11. Visualization of Research Results at SMKS Metland School

SMKN 1 Bojonggede

The total value of teaching factory implementation is 84.13 which means good. In the field of management, the score is 77.67. Improvements can be made by implementing job descriptions for each managing officer. In the field of marketing it is 78.33 which means it is enough, it can be improved by using promotional media to make it more effective. In the field of industrial relations it is 86.25 which means good.

In the field of practical space, it is 86.54 which means good. In the field of learning patterns, it is 83.33 which means good, learning activities can take place well to lead students to acquire the competencies to be achieved. In the field of Human Resources (HR) it is 86.44 which means good. In the field of products and services, it is 86.44 which means good. In the area of competency, it is 88.00, meaning that student competency is well maintained by having a business center and participating in student competency competitions. The results of the data obtained from SMKN 1 Bojonggede are then modeled visually with table and radar chart as follows.

Table 15. Assessment Results at SMKN 1 Bojonggede

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	77,67	73,33	86,25	86,54	83,33	86,44	86,44	88,00	84,13

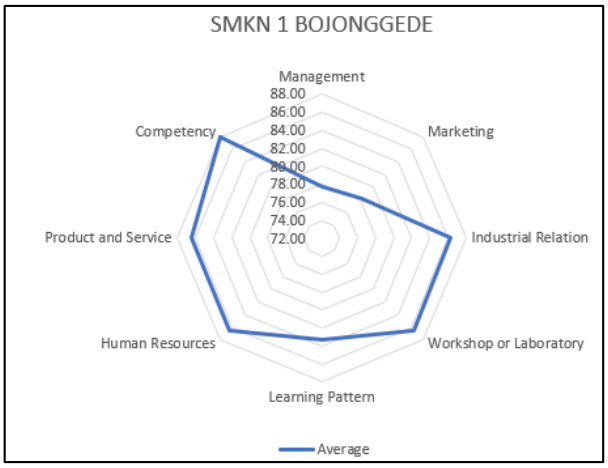

Figure 12. Visualization of Research Results at SMKN 1 Bojonggede

SMKS Pelita Nusantara

The total value of implementing the teaching factory is 78.26, which means it is enough. In the field of management, the score is 76.67. In the field of marketing, it is 73.33, the promotional media that is owned has not been able to be utilized effectively. In the field of industrial relations, it is 79.58, which means it is enough, it can be increased by looking for partner industries that can order products continuously.

In the field of practice room it is 80.26 which means good. In the area of learning patterns it is 73.33 which means it is enough, it can be improved by implementing a block schedule so that learning can be maximized. In the field of Human Resources (HR) it is 80.44 which means it is good. In the field of products and services it is 82.44, the products and services produced are of good quality and in the field of competence it is 80.00 which means good. The results of the data obtained from the Pelita Nusantara Vocational School are then modeled visually with table and radar chart as follows.

Table 16. Assessment Results at SMKS Pelita Nusantara

Parameter	Management	Marketing	Industrial Relation	Workshop or Laboratory	Learning Pattern	Human Resources	Product and Service	Competency	Average
Result	76,67	73,33	79,58	80,26	73,33	80,44	82,44	80,00	84,13

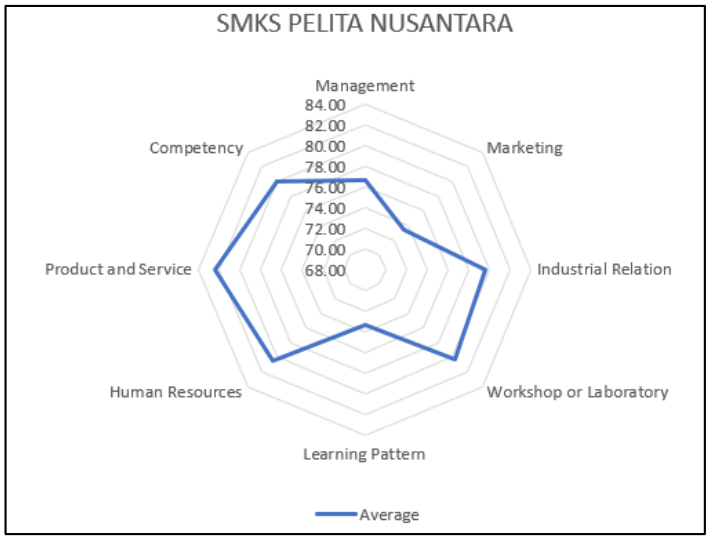

Figure 13. Visualization of Research results at SMKS Pelita Nusantara

CONCLUSION

Teaching factory is a learning model by applying competency-based learning processes and production-based learning. Achievement of competencies obtained by students is through production activities that refer to standards and procedures that apply in the industry. The achievement of high scores in the application of teaching factory is supported, among other things, by synchronizing the curriculum between schools and industry, so that schools know the types of competencies students must master. In addition, the types of products or services that students need to practice or produce are obtained. By carrying out the production process, students gain competence. To be able to synchronize the curriculum, the school's industrial relations department must collaborate with partner industries that are in accordance with the competency of multimedia expertise. Human Resources (HR) are needed, namely teachers to take part in teacher apprenticeship programs in industry. The production process to obtain these competencies is carried out in classroom learning activities by applying a work culture and standard operating procedures (SOP) for making products in accordance with the industry. Then it is very important that schools have equipment that is close to industry standards as a practice facility for students. For the fulfillment of these tools, it can be sourced from government assistance, procurement from schools, as well as grants from industry. In order for production activities carried out by students to be focused, not interrupted by general or normative and adaptive subjects, it is necessary to implement a block schedule system. In addition, the purpose of implementing a block scheduling system is to optimize owned facilities. Ideally, so that the implementation of learning activities can be maximized, the ratio of tools to students is 1:1.

The results of the products and services made by these students, if they are not orders from clients, then they are the remnants of the learning process, so that these results are not wasted, promotion of these products can be carried out to the public, provided that these products have use value and quality meets the standards monitored by quality control. Quality control for products ordered by the industry is directly from the industry, while for products made by students at school to achieve competence is the head of expertise competency. Suggestion for the next researcher is the research instrument compiled for evaluating the implementation of teaching factories should preferably be a

management model based on the potential of schools and regions so that the policies adopted by management are in accordance with the objectives.

REFERENCES

Amin, M. M. (2016). *Panduan Pelaksanaan Teaching Factory Direktorat Pembinaan Sekolah Menengah Kejuruan*. Jakarta: Kemendikbud.

Casmudi, C., Sugianto, S., Maulida, D. T., & Angga, H. (2022). Implementation of Teaching Factory Vocational School of Center Of Excellence (PK) (Case Study of Learning Aspects of the Culinary and Clothing Expertise Program at SMK Negeri 4 Balikpapan). *Budapest International Research and Critics Institute-Journal, 5*(2), 11033–11045.

Diwangkoro, E., & Soenarto, S. (2020). Development of teaching factory learning models in vocational schools. *Journal of Physics: Conference Series, 1456*(1).

Hasson, F., McKenna, H. P., Keeney, S., & McKenna, H. (2011). *The Delphi Technique in Nursing and Health Research*. London: Wiley.

Khurniawan, A. W. (2016). *Grand Design Pengembangan Teaching Factory dan Techopark di SMK.* Jakarta: Direktorat Jenderal Pendidikan Dasar dan Menengah Kementerian Pendidikan dan Kebudayaan Republik Indonesia.

Lestari, L. (2014). *Efektivitas Pelaksanaan Teaching Factory Siswa Sekolah Menengah Kejuruan (SMK) di Solo Technopark*. *Unpublisehed Thesis.* Universitas Sebelas Maret.

Makhbubah, E. (2020). Pembelajaran Teaching Factory (TEFA) Berbasis Unit Produksi Untuk Meningkatkan Semangat Kewirausahaan Siswa Kelas XI SMK Negeri 6 Semarang.*Unpublished Thesis*. Universitas Negeri Semarang.

Manalu, S. R. I., Hermanto, S., Duling, J. R., Siswandi, G., Supriyadi, S., & Siahaan, A. P. (2017). *Tata Kelola Pelaksanaan Teaching Factory*. Jakarta: Direktorat Pembinaan Sekolah Menengah Kejuruan Kemdikbud.

Mourtzis, D., Panopoulos, N., Angelopoulos, J., Zygomalas, S., Dimitrakopoulos, G., & Stavropoulos, P. (2021). A Hybrid Teaching Factory Model for Supporting the Educational Process in Covid-19 Era. *Procedia CIRP*, *104*, 1626–1631.

Novalinda, R., Ambiyar, & Rizal, F. (2020). Pendekatan Evaluasi Program Tyler: Goal Oriented. *Edukasi: Jurnal Pendidikan*, *18*(1), 137-146

Purnomo, P., Widiyanti, W., Renita, R., & Dika, J. W. (2020). Studi Tentang Pelaksanaan Teaching Factory SMK di Kota Malang (Studi Multi Kasus) a Study of the Vocational High School Teaching Factory in Malang (Multi-Case Study). *Jurnal Pendidikan Teknik Mesin, 7*(2), 150-161.

Risnawan, R. (2019). Manajemen Teaching Factory dalam Upaya Pengembangan Mutu Pembelajaran di SMK. *Media Manajemen Pendidikan, 2*(1), 1-13.

Rizky, D. A. F, Marji, M. & Tuwoso, T. (2018). Pengaruh Dukungan Industri terhadap Keberhasilan Siswa Melaksanakan Teaching Factory. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan, 3*(6), 799-805.

Rusmulyani, R. (2020). Technical Vocational Education and Training (Tvet) Innovation dengan Model Pelatihan Berbasis Kompetensi dalam Pengembangan Soft-Skill Sumber Daya Manusia. *Jurnal Inovasi Penelitian, 1*(8), 1495-1506.

Stufflebeam, D. L., & Zhang, G. (2017). *The CIPP Evaluation Model. How to Evaluate for Improvement and Accountability.* Guilford: Guilford Press.

Stufflebeam, D. L., & Coryn, C. L. S. (2014). *Evaluation Theory, Models, and Applications Second Edition*. San Fransisco: Jossey-Bass.

Sudiyono, S. (2019). Teaching Factory sebagai Upaya Peningkatan Mutu Lulusan di SMK. *Jurnal Penelitian Kebijakan Pendidikan*, *12*(2), 159-181.

Yusuf, A. R. & Mukhadis, A. (2018). Model Pengembangan Profesionalitas Guru Sesuai Tuntutan Revitalisasi Pendidikan Vokasi di Indonesia. *Lectura: Jurnal Pendidikan, 9*(2), 130-139.