

# Apprenticeship Implementation of Productive Teacher at Vocational School in Indonesia

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**Abstract**—The Indonesian government has established a regulation on apprenticeship program for vocational teacher in the relevant industry. It is a structured training program which aims to provide teachers with knowledge and competency required to achieve mastery of a specific occupation for strengthening their pedagogical role in vocational education. This article presents the current practice of the teacher apprenticeship in Indonesia, especially in vocational high school. The evaluation assesses three main topics: school–industry partnership, description of general issues in the teacher apprenticeship program and effectiveness of the apprenticeship program. The research approach used is narrative inquiry which involves several respondents from vocational schools and selected companies. The sample sizes of the purposive sampling utilized are 44 school principals, 24 representatives from industry, 102 students and 88 teachers. This research indicated a mismatch between the competencies of the newly graduates and the requirement of industry. The unbalance of theory with practice could be one of the reasons of that gap. It was also observed that the industry engagement in the vocational education is considered to be low. The school has planned a teacher apprenticeship, but it has not been implemented properly. The teacher apprenticeship carried out so far is still dominated by mastery of knowledge with little practice. As suggestion for the government, as a program, Apprenticeship is designed to be flexible and able to adaptive to the needs of employers and apprentices across the economy as a whole.

**Keywords**—*teacher apprenticeship; vocational learning; graduate quality*

## I. INTRODUCTION

This paper is the result of studies showing a gap between what is learned in vocational schools and what is required of adequately functioning professionals in an ever more complex world [1]. The study was conducted on vocational education in Indonesia. This study is important to do, because graduates of vocational education in Indonesia, also in several countries, are experiencing mismatch problems with the needs of the world of work [2]. In Indonesia, vocational education graduates are currently unemployed. According to BPS data for 2016, two main problems were recorded: competent teachers were only 22.3% and the learning process was not link-and-match with working world [3]. On the other hand, the productive teachers of vocational schools still have a low competency [4].

Incompetent teachers could not implement integral learning process. Liesbeth KJ and Baartman EB stated that learning processes towards the integration of knowledge, skills and attitudes largely remain a black box [5]. Competence is generally defined as consisting of integrated pieces of knowledge, skills and attitudes [6], and is assumed to be prerequisite for adequate functioning on the job [7,8]. The construct of competence is defined differently in many studies and the debate on its proper definition continues [9]. Competence as a means of developing superior performance [10]. A common notion of most competence definitions is that it consists of integrated pieces of knowledge, skills and attitudes that can be used to carry out a professional task successfully. Whereas many researchers define competence as the integrated whole of knowledge, skills and attitudes, we postulate that integration should be measured as a learning process and competence as a learning product. Competence is also connected to the certification of capability, to ensure that new professionals have the capability for appropriate performance in a complex reality [11].

Sutijono concluded that only 73.5% of learning outcomes in vocational schools were less relevant to working world [12]. Consequently, the quality and relevance of vocational school graduates decreased. Employers say that they are less satisfied with the current vocational school graduates' competence [13]. Joy A. Palmer states that inappropriate learning has an impact on the increasing number of unemployed graduates from year to year [14]. Based on BPS data for 2016, of the 7.56 million total open unemployment, 20.76% are categorized in having vocational education. This is very contrary to the data on labor requirements in Indonesia. Based on data as of September 2016, the amount of supply-demand labor in Indonesia is seen as in table 1.

**TABLE I. JOB OPPORTUNITY ANALYSIS FOR VOCATIONAL SCHOOL GRADUATES [15]**

No.	Expertise Fields	Vocational School Graduates in 2016	Labor Needs	Shortage (-)
1	Technology and Engineering	445,047	638,652	(193,605)
2	ICT	277,545	327,813	(50,268)
3	Health	60,944	68,245	(7,301)
4	Agribusiness and Agrotechnology	52,319	445,792	(393,473)
5	Fisheries and Maritime Affairs	17,249	3,364,297	(3,347,048)
6	Business and Management	348,954	119,255	229,699
7	Tourism	82,171	707,600	(625,429)
8	Fine Arts and Crafts	10,017	81,833	(71,816)
9	Performing Arts	2,000	6,300	(4,300)
<b>TOTAL</b>		<b>1,296,246</b>	<b>5,759,787</b>	<b>(4,463,541)</b>

Based on table 1, the data shows that the shortage of the labor from vocational school graduates in various sectors is 4,463,541 people.

In line with this condition, Djojonagoro stated that there is still a gap between education world and working world [16]. Based on data from Indonesian statistic as of February 2017, the number of unemployed vocational school graduates reached 10 % of the 7.01 million unemployed people. The Indonesian Ministry of Industry stated that the average industrial growth of 5-6 percent per year, it takes more than five to six hundred thousand new industrial labor each year.

The era of disruption is an era where economic, political and social change is very fast and unpredictable [17]. Vocational education held appropriately will be able to adapt to any kind of situation [18]. Teachers who teach competencies as closely as possible with the future work are educational models that are easily adaptable [19]. Conceptually, one of the strategic efforts to overcome the problem of low quality and relevance of graduates is to improve the teacher's competence [20]. In every country, despite its different circumstance, teacher competence in vocational education must be improved [17,21,22]. There are many efforts to improve teacher competence such as training, short courses, apprenticeship, internship, learning by doing, and others [23]. Apprenticeship is a particular way of enabling students to learn by doing [24]. It is a crucial issue as learning at work enhances apprentices' competence development and prepares them for professional development on the job [25]. According to Pratt and Johnson, apprenticeship is a real learning process, because it goes through a series of clear stages [24]. Schön states that learning in apprenticeship is not only about learning to do (active learning), but also requires an understanding of the contexts in which the learning will be applied [26].

Teacher apprenticeships designed together with the working world have been implemented by many schools and succeeded Leinhardt [5]. Seiment state that vocational teachers should improve their competence through on-the-job training and apprenticeship [27]. Finlay [18]; Leinhardt concluded that apprenticeship activities can improve the teacher's competence through Work Based Learning (WBL) activities [5]. Apprenticeship for the productive work-based vocational teachers is necessary to be carried out because it has enormous benefits, especially introducing working environment and aligning competency standards in accordance with the realistic

demands of modern working world [21]. Lucas explains that "the redefining of apprenticeship, the role of the employer in setting the standard, the simplification of the system to one standard or qualification per occupation, the freeing up of the curricula and of teaching methods, the robust testing of accomplishment, the funding of apprenticeship training and the generation of demand and supply " [20].

It is necessary to do apprenticeship for the productive work-based vocational teachers because it is a demand for the structure of the vocational education curriculum [28]. Sulaiman, Suziah mentioned that the real knowledge and experience gained from the apprenticeship results can provide learning insights according to needs [29]. However, in fact, the teacher apprenticeship program has not been carried out well. Usep said that the problems of apprenticeship in Indonesia are the program is still in the form of training, it has a weak industrial cooperation, and the schools and the teachers have not yet seriously planned the apprenticeship [30]. The main reason is that there is no standard model that serves as a guideline between the teacher/school and industry [31], even though the regulations on financing have existed [32]. This paper describes the model of the implementation of vocational teacher apprenticeship comprehensively.

## II. RESEARCH METHOD

The research design used in this study is narrative inquiry. Narrative inquiry, a relatively new qualitative methodology, is the study of experience understood narratively. It is a way of thinking about, and studying, experience. Narrative inquirers think narratively about experience throughout inquiry. Narrative inquiry follows a recursive, reflexive process of moving from field (with starting points in telling or living of stories) to field texts (data) to interim and final research texts. Commonplaces of temporality, sociality and place create a conceptual framework within which different kinds of field texts and different analyses can be used. Narrative inquiry highlights ethical matters as well as shapes new theoretical understandings of people's experiences. Data for this study were collected using three techniques, namely observation, in-depth interview, and questionnaire. Population in this study is the principal, teachers, students and industry leaders. Purposive sampling was taken to limit population, with 321 respondents, consisting of 44 principals, 24 industry leaders, 102 students, and 88 teachers. The statements in the questionnaire are used to

obtain data on the problem of apprenticeship, teacher's knowledge of the main tasks and about the industrial apprenticeship program for productive teachers, as well as the implementation and obstacles that occur in the program. Meanwhile, interview is in the form of in-depth interview in order to obtain data to strengthen the gathered data from the questionnaire. The interview is useful to find out the description of the implementation of an industrial apprenticeship program. Observation and depth interviews employs structured note instruments, while the questionnaire method, made use of an organized and detailed set of questionnaires. Furthermore, to validate the instrument, the expert judgement and Delphi technique was used.

### III. RESULTS AND DISCUSSION

This research finding are grouped into three subjects, namely, the relationship between the industry and vocational schools, the implementation of industrial apprenticeship, and the results of the implementation of the industrial apprenticeship program.

#### A. The Relationship Between the Industry and Vocational Schools

Based on the data obtained, there is a gap between industry needs and the competence of vocational graduates figure 1. 81% of respondents stated this. This is in line with Dani Wardani's statement that said that there is a competency gap between Vocational Schools and Industry caused by differences in goals [33].

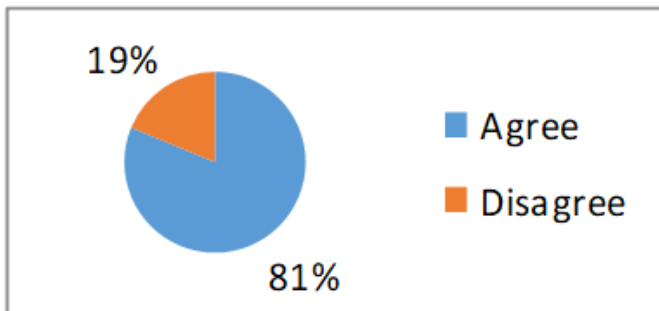


Fig. 1. Gaps in vocational competencies of vocational graduates with workplace needs.

The industrial workplace needs competent vocational graduates. However, vocational schools want their student to graduate with high grades without caring about how competent they are [34]. Also, there are gaps that exist between schools and the industry as shown in figure 1. At school, students are trained with the basic tools, while in the industrial workplace uses modern equipment to support production needs.

Vocational education cannot be separated from the industrial workplace [16]. From the data that has been obtained, it is known that 81% of schools have collaborated with the industry to develop their curriculum [35]. It also has collaborated with the industry by sending their graduates to the industry on apprenticeships. However, the industry involvement has not been maximized. It only provides an

overview of curriculum objectives and they have not been actively involved in the preparation of the curriculum [36]. Schools have realized that industrial involvement in curriculum preparation benefits both parties, because the industry does not need to conduct training for vocational graduates if their competence is in line with their needs. Vocational schools will also benefit from the industry involvement as this will increase the absorption rate of their graduates to the industry.

#### B. Implementation of Industrial Apprenticeship Programs for Productive Teachers of Vocational

Teachers have main duties stipulated by the government. The research data shows that vocational teachers have agreed, supported, and implemented industrial apprenticeship program policies for productive teachers of vocational schools. The teachers know the importance of this program for improving their teaching capabilities. Here are some of the reasons why teachers agreed to undergo an apprenticeship:

- To gain more insights that will improve their teaching methods
- To improve their competency.
- To ensure that lessons and skills taught are in accordance with industry requirements.
- To develop a curriculum that is suitable for the industrial workplace
- To ensure that teacher competencies are in line with industrial workplace competencies

Based on figure 2, there are 38 % of teachers in different schools have not implemented an apprenticeship program. It is surprising to know that a lot of teachers are yet to implement this program even though regulations on the implementation of the teacher apprenticeship program has been set.

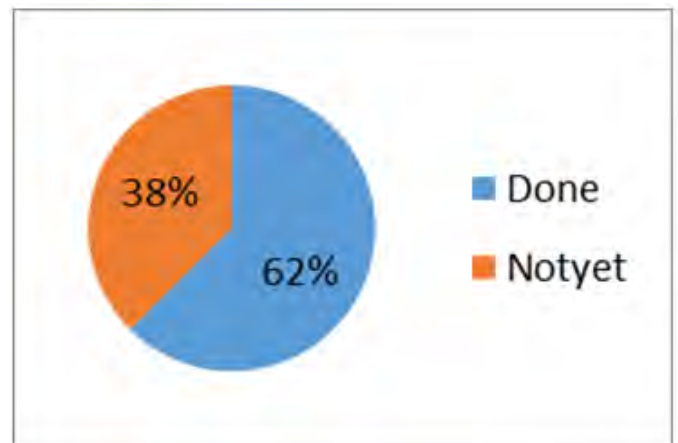


Fig. 2. Percentage of teachers who have implemented apprenticeships.

The duration of the apprenticeships conducted by the teachers ranged from one week 1 month to 3 months. There is a need for adequate preparation for the apprenticeship program in a way that it does not interfere with regular teaching and learning activities in schools.

Most teachers that have not implemented a teacher apprenticeship program are those who come from new school units. The number of productive teachers in schools are few. If some teachers implement the apprenticeship programs, it will disrupt the learning activities, as there is no substitute teacher. Every school has planned an apprenticeship program for teachers but not all teachers have participated in these program. The plans made by the schools include preparation of partnerships with the industry, preparation of budgets, preparation of mentors, and conduction of monitoring and evaluation. Among the plans that were made, partnerships and guidance have been successfully implemented, while budgeting, monitoring, and evaluation have not been fully implemented. After the apprenticeship, the teacher does not automatically get competency recognition. Teachers devote money, time and energy for these apprenticeships. The government need to provide a form of compensation for apprentice teachers.

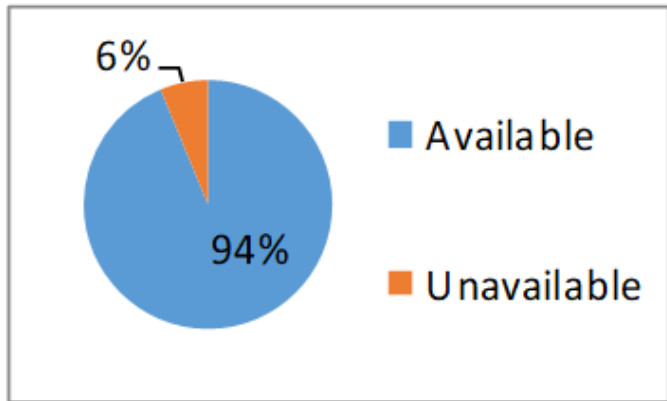


Fig. 3. Availability of apprentice counselors in the Industry.

Figure 3 shows that 94 % of the teacher apprenticeships in the industry has been provided a mentor. These schools worked with the industry in placing apprentice teachers.

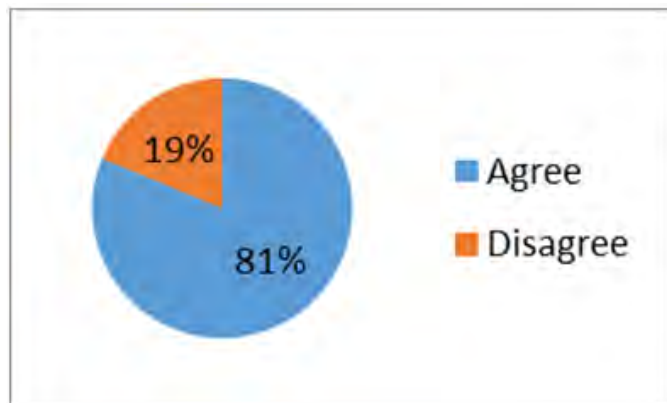


Fig. 4. Industry response to the apprenticeship program.

Figure 4 shows that 81% of teachers stated that the industry had responded positively to the apprenticeship program. This means that the industry has committed itself to improving the quality of vocational education in the country. Industrial apprenticeship programs benefits teachers, schools, students and etc. With apprenticeships, schools can improve teacher

competency and graduate quality. The industry can now get competent workers from vocational schools according to their needs.

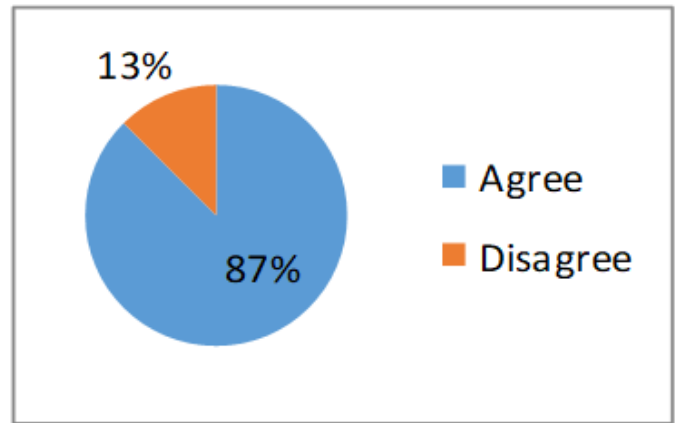


Fig. 5. Industrial treatment of apprenticeship teachers.

Figure 5 shows that 88% of teachers stated that the industry treated apprentices well according to agreed procedures.

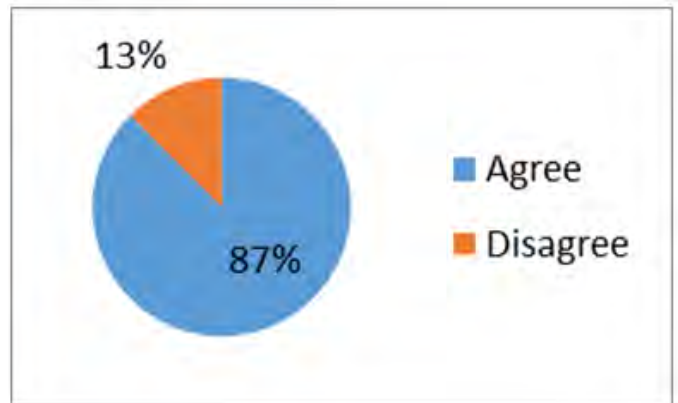


Fig. 6. Achievement of industrial apprenticeship learning.

Figure 6 shows the teacher's understanding of learning outcomes through apprenticeships

The Understanding of learning achievement is measured based on three indicators, namely the aspects of reaction, content, and process. The reaction aspect is useful for knowing the framework for implementing an apprenticeship. The content aspect is useful for knowing the extent of absorption of trainees in apprenticeships as well as the impact of the apprenticeship program for increasing knowledge, skills and attitude of the participants during the apprenticeship theory and practice. Based on figure 6, 81% of the teachers stated that desired learning outcomes could be accomplished through apprenticeships.

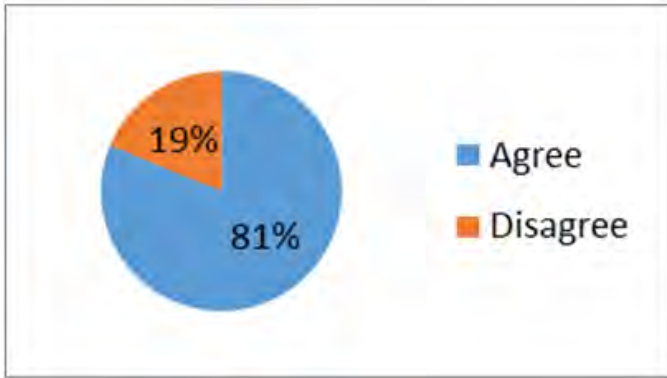


Fig. 7. Obstacles in implementing the apprenticeship program.

Based on figure 7, 81% of apprentices stated that there were obstacles in the implementation of the apprenticeships. This shows that the implementation of the apprenticeship had some problems that need to be resolved. The government must be willing to facilitate both parties to find a solution. If left unattended to, teachers will be reluctant to go for apprenticeships. Based on in-depth observation and interviews, the biggest obstacle is the cost factor. This is evident by the results of the study shown in figure 8.

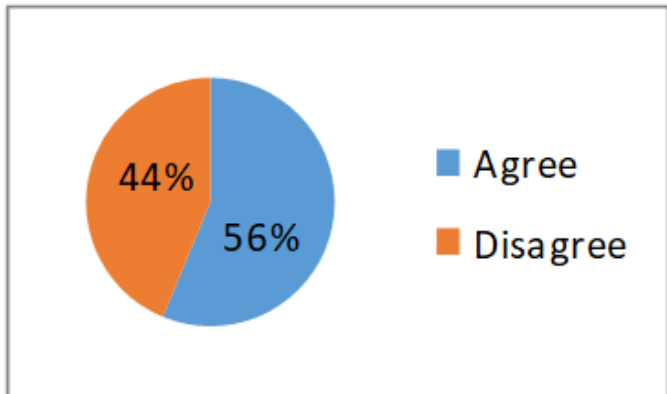


Fig. 8. Costs being a major constraint in the implementation of apprenticeship programs.

Among the obstacles, 56% stated that the major obstacle was the cost. There are several reasons behind this problem as follows:

- Industrial apprenticeship programs for vocational teachers require considerable costs.
- Schools have limited budgets.
- The industry does not have a budget for industrial apprenticeships for teachers.

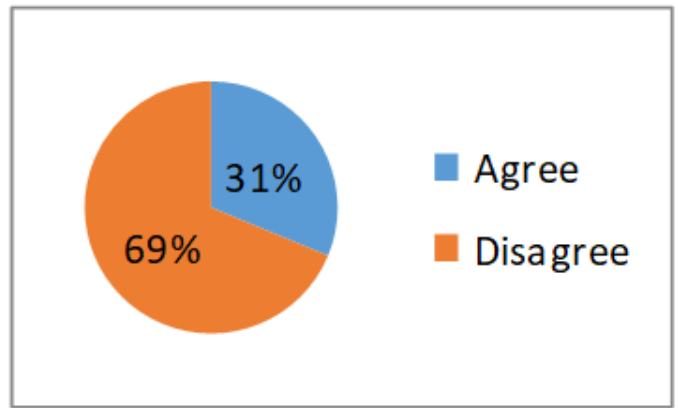


Fig. 9. Disruption of lessons due to apprenticeship program implementation.

In addition to the costs, there are other obstacles in the implementation of the teacher apprenticeship programs, which disturb the learning process in schools. Teacher interns will leave their class and there are no replacements for a lot of teachers. Figure 9 shows that 31% said they left class without replacements.

Another obstacle is time duration. As shown in figure 10, 69% of teachers stated that the time given in the implementation of vocational teacher industry apprenticeship programs was inadequate. If the time is not enough, the knowledge and skills taught in the industry will not be able to significantly improve teacher competencies.

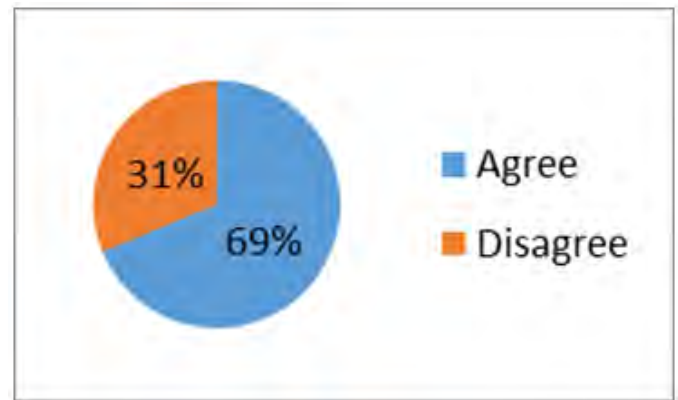


Fig. 10. Non-compliance with teacher's apprenticeship program implementation time.

Based on the apprenticeship implementation process, it was concluded that the schools and teachers have understood the importance of apprenticeship. Schools have planned apprenticeships but have not been fully supported by strict procedures.

### C. Results of Industrial Apprenticeship Program Implementation

Every apprenticeship program that is carried out must have its own advantages for the executor and the surrounding environment. The advantages of an apprenticeship program to increase the competencies of teachers and students are as follows:

1) For teachers;

- Improvement of competence, upgrading of knowledge, gaining of experience and ability to understand the actual industrial situation
- Teachers gain more skills and they can teach with more confidence and more understanding of the material given to students.
- Teachers now add more variety to their learning materials.
- Teachers inspire students to improve their competence.

2) For Students

- Students have more insight into the industrial world.
- Students gain upgraded learning materials. The relevance and quality of student competencies have been improved to suit their needs.
- Students have gained knowledge about competencies needed in the industry.

3) For schools

- Curriculum has been adjusted to meet the needs of the industrial workplace.
- The industry has been involved in various school programs.
- Public trust has been increased in schools.

The implementation of industrial apprenticeships for teachers has largely been in accordance with regulations. However, there are still some schools that state that in its implementation, the industrial apprenticeship program is still not in line with regulations. Figure 11 shows the suitability diagram for implementing an apprenticeship with regulations.

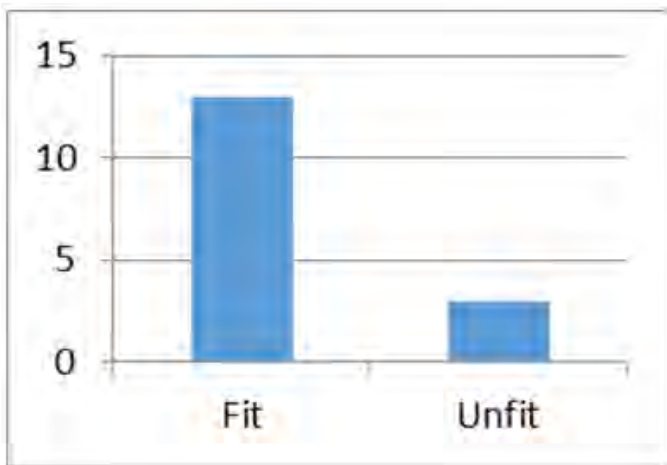


Fig. 11. Suitability chart of apprenticeship program implementation with regulation.

The Ministry of Industry of the Republic of Indonesia Number 3 of 2012 has a regulation that is used as a guideline for developing competency-based Vocational High Schools. In the regulation, the role of vocational schools is explained, among others. Also mentioned, is the preparation of a curriculum that meets the Indonesian National Work

Competency Standards (SKKNI). This effort will involve industry professionals and associations. Vocational schools need to provide minimum requirements for practical facilities that will meet teachers' needs.

Meanwhile, the role of industry, among others is to provide input for aligning the curriculum in vocational schools, facilitating work practices for vocational students and apprenticeships for teachers, providing instructors with practical work and apprenticeships, and issuing certificates for vocational students and teachers. As a form of implementation of this regulation, the Ministry of Industry has appointed a number of industry professionals as pioneers.

Then, there is also Presidential Instruction No. 9 of 2016 concerning Vocational Revitalization. No less than 12 ministries, including all state-owned enterprises (BUMN), 34 governors and the National Professional Certification Agency (BNSP) are jointly responsible for meeting the competency standards of vocational school graduates [37].

In the Presidential Instruction No. 9 of 2016, it is stated that productive teachers are required to carry out apprenticeship activities. Teacher apprenticeships are expected to bridge the gap between vocational school learning and the demands of the workforce. But, there are still many schools that have not assigned teachers to take part in industrial apprenticeships. This is contrary to the regulations mentioned above [37].

Statistics were also given for Follow-up post-apprenticeships. Figure 12, shows that 69% of participants stated that there was no follow-up after the apprenticeship.

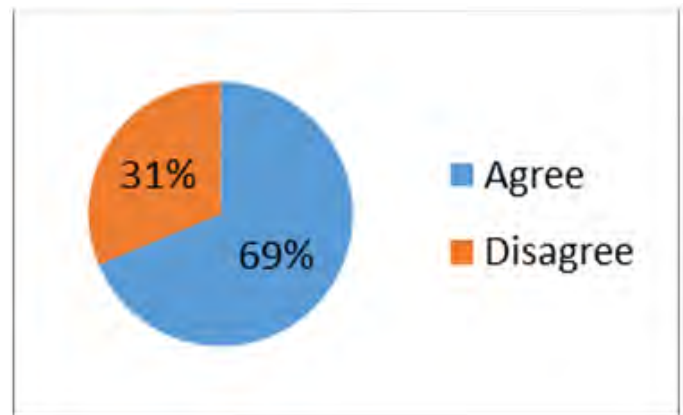


Fig. 12. Pie diagram showing follow-up of the apprenticeship program.

Follow-up is important after its apprenticeship that provides the following benefits:

- Improvement of collaboration between schools and industry where the apprenticeship is conducted by the teacher
- Improvement of the curriculum
- Competency testing and professional certification

IV. CONCLUSION

The results of this study indicate that there is a gap between workplace needs and graduate competencies. This is due to

learning that is focused on achieving theoretical knowledge alone. Teachers need to realize that they must improve competence. Even though the School has involved the industry, they are only involved in giving lectures and suggestions on improving the quality of vocational education. The school expects the industry to periodically make discussions on how vocational education can be improved. The industry has not provided apprenticeship programs to teachers in full. The government has regulations on apprenticeship, but there is no specific substance in the form of industrial involvement. The school has planned teacher apprenticeship, but it has not been implemented according to plan. The reason is that the planning is only done by the schools and does not involve the industry. So, the implementation of the apprenticeship is not in accordance with the industrial schedule. The teacher apprenticeship carried out so far is still dominated by mastery of theoretical knowledge, with little practice. Several obstacles have been found, namely costs, the interdependence of learning in the classroom, little apprenticeship time, and the lack of recognition after the apprenticeship. The apprenticeship Program is a system which is responsive and can be adapted to suit the demands of the labor market so that graduates can meet the skills needed by employers. The apprenticeship program, should be designed to be flexible adaptable to meet the needs of employers across the economy as a whole.

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