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Machining industry's contribution level in vocational high school revitalization

A E Wibowo¹ and S Munadi²

¹Graduate School, Yogyakarta State University, Yogyakarta, Indonesia

²Department of Mechanical Engineering Education, Faculty of Engineering, Yogyakarta State University, Yogyakarta, Indonesia

E-mail: sudji.munadi@uny.ac.id

Abstract. Revitalization of Vocational High Schools (VHS) is an effort to increase the role of all stakeholders in developing education. This study aimed to measure the level of machining industry contribution in VHS revitalization, especially in Machining Skills Competence in Yogyakarta Special Region (DIY). This study used descriptive research with quantitative approaches. The population was 20 machining industry in Yogyakarta Special Region. Samples were determined by saturated sampling techniques. The number of samples selected were 14 machining industries. Questionnaires were used to measure the level of the machining industry contribution in implementation of VHS revitalization. Instrument validation used logical and empirical validity tests. Quantitative data analysis techniques used descriptive analysis. The results of the study showed that the level of machining industry contribution in VHS's revitalization, especially in Machining Skills Competence in DIY as a whole was in the "very low" category with a score of 42.67%.

1. Introduction

In Indonesia, skilled intermediate labour is produced through Vocational High Schools (VHS). VHS are educational institutions that prepare graduates to work in certain fields. VHS graduates are expected to be a productive workforce. Ideal VHS graduates are workers who are ready to use, in the sense that they can directly work in the business / industry or entrepreneurship. This is stated in Law number 20 of 2003 concerning the National Education System Article 18 and an explanation of Article 15 which regulates Vocational Secondary Education. However, in reality there are still many SMK that have not been able to produce the ready to use labour according to the industry needs so that many SMK graduates still do not get a job.

Head of the Central Statistics Agency (BPS), revealed that from the Open Unemployment of 5.50 percent in August 2017, the highest unemployment was a VHS graduate of 11.41 percent. According to the Social Statistics Deputy of BPS, the number of unemployed vocational school graduates due to the expertise of SMK graduates is not necessarily in accordance with the needs of the company. Agreeing with this reason, the Head of the National Development Planning Agency assesses something is wrong with the vocational education curriculum in Indonesia so that the skills taught in schools are not in accordance with the needs of today's business world, where many new jobs are emerging that require certain skills. Therefore, the Indonesian government focuses on improving the quality of human resources (HR) through vocational education as a national priority in 2018.

One of the efforts made by the government to improve the quality of vocational schools is the Vocational Revitalization program. The legal basis for this revitalization is Presidential Instruction No.



9 of 2016 concerning Revitalization of Vocational Schools. Strategic issues which are the priority of vocational revitalization, namely updating curriculum alignment with industrial needs; learning innovation; fulfilment and improvement of the professionalism of teachers and education personnel; partnership / school collaboration with the business world / industrial world (DUDI) and universities; standardization of key facilities and infrastructure; and institutional arrangement / management. The strategic issue means that it has become imperative, that the key to the success of vocational revitalization is the collaboration between the school and the industry. This is in accordance with the statement delivered by the Minister of Education when launching an industrial vocational education program that every vocational school must partner with industry.

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Education Revitalization is an effort to increase the role of all stakeholders in developing education. According to Hadam, et al., revitalization of Education is a more thorough effort, more persistent and more responsible to realize the goal of national education [1]. Revitalization in the context of vocational education is intended to maximize the role of the Government, Regional Government, and the World of Work / Industrial World to really care for Vocational Schools. Vocational revitalization is carried out through several steps, but if observed there are 6 steps that involve the industry's contribution as follows. 1) Cooperation "link and match"; 2) industrial work practices; 3) establishment of industrial class; 4) the implementation of an internship teacher (on the job training); 5) Industrial Based Curriculum; 6) Factory Teaching.

Based on the description above, it is necessary to study DUDI readiness in implementing the VHS revitalization, especially in machining engineering expertise. The readiness can be seen from the level of industry's contribution to VHS development as a foundation in determining strategic steps to strengthen the relationship between vocational schools and machining industries.

2. Method

This study used descriptive research with quantitative approaches. The population was 20 machining industry in Yogyakarta Special Region. The decision of selecting the samples is through saturation sampling method because of the small population. The number of samples selected were 14 machining industries. Questionnaires were used to measure the level of the machining industry contribution. Instrument validation used logical and empirical validity tests. Quantitative data analysis techniques used descriptive analysis.

3. Result and Discussion

The contribution level of the machining industry in the overall SMK revitalization effort is in the very low category. This can be seen from 14 respondents, the contribution rate of 9 respondents is in the very low category and the contribution rate of 5 respondents is in the low category. In addition, when viewed from the accumulation of scores and the average accumulation of scores, the level of contribution can be expressed in percentages by comparing the mean value of the research results by

47.79 with an ideal score of 112, so that the contribution rate is 42.67%. The interpretation of the percentage level of contribution of the machining industry in DIY in the vocational revitalization efforts, as a whole, falls into the "very low" category.

These findings further emphasize that the contribution of the machining industry in DIY in order to participate in implementing the steps to revitalize vocational schools needs to be improved. This finding is in accordance with the results of research conducted by Indriaturrahmi which say that the role of related industry in implementing regional government policies to the SMK development is not yet optimal [2]. The Head of Department of Education, Youth and Sports DIY Department of Education also added that the contribution of the business world and industry (DU-DI) in the development of vocational secondary education is still low, so the DIKPORA DIY Department conducts various activities in order to facilitate the improvement of access to education to the industrial world.

These findings deserve to be a basic evaluation by the government in this case the relevant institution (Department of Industry and Department of Education), vocational school, and machining industries. Government policy will greatly influence the role of industry in participating in developing vocational schools. Schools must also improve to improve good relations through partnerships and mutually beneficial cooperation with industry, so that the industry is more comfortable to participate in developing vocational schools. The results of contribution level analysis of the machining industry in vocational revitalization efforts in each aspect can be seen in table 1.

Table 1. The Contributions Level of Machining Industry in VHS Revitalization Efforts

No	Aspect of Contributions	Contributions level (%)	Categories
1	Cooperation aspect for building "link & match"	55,60	Low
2	Apprenticeship program	72,15	High
3	Teacher internship program	31,45	Very low
4	Industrial class program	25	Very low
5	Curriculum development	36,61	Very low
6	Teaching factory program	32,14	Very low
	Over all	42,67	Very low

3.1 The contribution level of machining industry in cooperation aspect for building "link & match"

The contribution level of the machining industry to cooperation aspect is expressed in percentages which is done by comparing the average value of the research results of 15.57 with an ideal score of 28 so that the contribution level of 55.60% is obtained. Interpretation of the percentage level of contribution of the machining industry in DIY in the effort to revitalize vocational schools in aspects of cooperation falls into the "low" category. This is in line with the results of research by Bambang and Budi which states that the results of the partnership between SMK and industry are still not optimal, so that the placement of graduates in work is not in accordance with the competencies of students [3]. Azizah, Murniati, and Khairuddin, in their research recommended that schools and stakeholders be more communicative in establishing cooperative relationships to improve graduates' competencies [4].

3.2 The contribution level of machining industry in apprenticeship program

The contribution level of machining industry to aspects of the apprenticeship program is expressed in percentages which is done by comparing the average value of the research results of 14.43 with an ideal maximum score of 20 so that the contribution rate of 72.15% is obtained. The interpretation of

the percentage level of contribution of the machining industry in DIY in the efforts to revitalize vocational schools in aspects of industrial work practice programs is in the "high" category. This is an important capital for the development of vocational education. The high contribution of industry to the apprenticeship program is inseparable from the reason that the industry can get a positive impact directly through this program. The results of interviews with 14 industry respondents showed that 6 industries said they were greatly helped by the existence of students. This is in line with the opinion of Hee who said that industrial work practices programs can benefit the industry because they can obtain the fresh ideas and energy that students bring into the work environment [5].

The findings above also show the weaknesses that have occurred during the implementation of industrial work practices, namely cooperation to coordinate and formulate industrial work practice training programs between the vocational school and industry is still very low. This is in accordance with the study conducted by Rasyid which states that industries that are school partners have not been able to participate in planning student learning activities in shaping student professionalism [6]. These findings further emphasize that students do work practices without planning so that sometimes students do not get learning in accordance with the competencies that must be mastered.

Collaboration to coordinate and compile instruments for evaluating work practices between the SMK and industry is still relatively low. Evaluation instruments are only arranged unilaterally by the school. Pragmatically, the school can compile apprenticeship assessment instruments that will be used widely in each industry where apprenticeship works, but it is important to realize that the competencies taught in each machining industry vary. Even in some industry sources, they said that they composed their own assessment instruments according to their ability. Furthermore, they said that they found it difficult to conduct an assessment because they did not have the ability in the field.

It is appropriate if both parties sit together to coordinate the things that will be assessed considering that industrial work practices are a collaborative program between schools and industry. Sudjana said that the success of revealing students' results and learning processes as they are (objectivity of assessment results) depends very much on the quality of the assessment tools in addition to the way they are implemented [7]. Therefore, it is expected that both parties can coordinate to formulate and use the instrument and include this activity as one of the points in the memorandum of understanding on technical internship.

3.3 The contribution level of machining industry in teacher internship program

The level of contribution of the machining industry to the aspect of the teacher apprenticeship program is expressed in percentages which is done by comparing the average value of the research results of 6.29 with an ideal maximum score of 20 so that the contribution level of 31.45% is obtained. The interpretation of the percentage level of contribution of the machining industry in DIY in the efforts to revitalize vocational schools in the aspect of the teacher apprenticeship program is in the "very low" category. These findings indicate that collaboration between Vocational Schools in particular Machining Engineering Skills Competencies with the machining industry needs to be improved. This is important because the teacher internship program can improve and update the teacher's understanding of the latest technology used in the industry and needs to be understood by students. Billet believes that the type of material delivered by a teacher to his students depends on his understanding and beliefs [8]. This implies that if a teacher has never taken an industrial apprenticeship program, the lesson he prepares for the class will not be in line with industry

development. Therefore the pattern of cooperation and the development model of industrial-based productive vocational teacher competencies needs to be developed.

3.4 The contribution level of machining industry in industrial class program

The contribution level of the machining industry to the aspect of the industrial class program is expressed in terms of percentage which is done by comparing the average value of the research results by 6 with a maximum score of 24 so that the contribution rate of 25% is obtained. The interpretation of the percentage level of contribution of the machining industry in DIY in the efforts to revitalize vocational schools in aspects of industrial class programs is in the category of "very low".

These findings indicate that there is no machining industry in DIY in collaboration with vocational schools to carry out industrial class programs. These findings also show that industrial class programs have not been implemented in vocational schools, especially in Machining Engineering Skills Competencies in DIY. This is certainly contrary to the government's considerable support. The government, through the Directorate of Vocational Development, has provided funding for the implementation of industrial class programs.

According to Yoto, based on the results of his study, steps that can be taken to prepare for the industrial education class are as follows: (1) building harmonious cooperation with industrial partners where apprenticeship; (2) planning an industrial education class (industrial education) model with industry which is outlined in a cooperation agreement by both parties; (3) compile a joint curriculum according to industry needs; (4) determine the needs of teachers / instructors who teach in schools and in industry; (5) determine the facilities and infrastructure of practices, textbooks and learning resources that must be prepared at school by both parties; (6) determine the learning schedule at school and industry (on the job training); (7) determine the implementation of national exams and competency tests [9].

3.5 The contribution level of machining industry in curriculum development

The contribution level of the machining industry in the aspect of curriculum development is expressed in percentages which is done by comparing the mean value of the research results of 2.93 with an ideal maximum score of 8 so that the contribution rate of 36.61% is obtained. The interpretation of the percentage level of contribution of the machining industry in DIY in the effort to revitalize vocational schools in the aspect of curriculum development is in the category of "very low".

These findings are in accordance with the findings of Mohtadi et.al which states that 52% of the opinions of workers and 64% of academic opinions state that the industry does not contribute maximally in reducing the competency gap between the world of education and the industrial world [10]. Industry contribution can be increased if the communication and cooperation relations between the two are improved. López and Pérez argue that the relationship between vocational education and the world of work holds an essential key to which vocational education must be able to provide education that is able to meet the needs of the workforce [11]. The findings of Mohtadi et.al, also state that, that academics and industry believe that gaps can be bridged through collaboration between stakeholders [10].

3.6 The contribution level of machining industry in teaching factory program

The contribution level of machining industry in the aspect of the teaching factory program is expressed in percentages which is done by comparing the average value of the research results of 2.57 with a maximum score of 8 so that the contribution rate of 32.14% is obtained. The interpretation of the percentage level of contribution of the machining industry in DIY in the SMK revitalization efforts in aspects of the factory teaching program is in the "very low" category. These findings indicate the low level of cooperation between SMKs and related industries. Siswanto released the results of the study that most of the RSBI Vocational Schools in DIY have not cooperated with industry related to the implementation of the teaching factory. This implies that over a decade, vocational cooperation with industry has become an unresolved classical problem [12].

4. Conclusions

The contribution level of the machining industry in vocational revitalization efforts, as a whole is included in the "very low" category with a score of 42.67%. The results of this study can be used as a reflection for policy makers, industry and vocational schools in improving vocational school revitalization efforts. In addition, more in-depth research is needed to explore the inhibiting and supporting factors for machining industry in contributing to the vocational revitalization program. The inhibiting and supporting factors can then be used as a basis for improvement in the future.

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