

# Level of Absorption and Suitability in the Field of Machining Work among Vocational School Graduates in Yogyakarta Region

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**Abstract** This study aims to (1) analyze the level of absorption and suitability of the field of work of graduates of the Mechanical Engineering Vocational School in the Yogyakarta Region, (2) find out how the strategies are carried out by the schools to maintain and improve the absorption and relevance of graduates. This research uses a quantitative descriptive approach. Sampling was done using proportional random sampling method. Data collection techniques are done using interview guidelines, observation, and documentation. The subjects of this study were the teacher who manages the special job fair, the head of the study program in the engineering department, the students and the teacher who handled the student industry practice program. The results showed that (1) the percentage of students' absorption in the world of work was 80%, the lowest was 60%, this showed that the incorporation of public and private SMK graduates in Yogyakarta was in the category of functional job readiness, because more than half had entered the world of work, but not all vocational students work according to their fields. The causal factors that influence the discrepancy in the area of student work in the world of work are the lack of cooperation between schools and industry, the availability of jobs in the machining sector is still minimal. (2) Strategies in dealing with technological developments are always carried out by schools to maintain and improve the absorption and relevance of graduates by creating learning variations that support the needs of 4C skills (critical thinking, communication, collaboration and creativity) implementing fun learning strategies, schools also organize machining workshops and seminars on the development of machining technology.

**Keywords:** 21st-century skills, revolution 4.0, work readiness

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## 1. Introduction

Indonesia is included in the category of the largest population, which ranks fourth with a population of 265 million people, a large number of people but low-quality human resources is a burden for Indonesia [1]. The level of Human Resources in Indonesia is still relatively low. This is evidenced through the Indonesian human resource index, which is in the 36th position out of 137 countries, the quality of Indonesian human resources is below the average of ASEAN countries. According to the Indonesian finance minister, Sri Mulyani Indrawati revealed, several factors can improve Indonesia's competitiveness, including the focus of the government in terms of human resource development through education investment [2], from this phrase shows that education is the initial foundation that has an essential role in improving the quality of human resources in Indonesia, Education is one way in order to prepare qualified and professional resources [3]. Education is a conscious effort to develop

the potential of human resources through teaching activities [4]. So education is a conscious effort to develop the potential of human resources through teaching and learning activities. The development of teaching and learning process in the 21st century emphasizes the ability of 4C (critical thinking, communication, collaboration and creativity) this is due to the need for work that has turned to automation so that robots and machines replace many workers, but thousands of types will emerge new work [5]. To deal with developments in the 21st century, everyone must-have 21st-century skills including (1) life and career skills, (2) learning and innovation skills, and (3) Information media and technology skills [6]. The skills are arranged in a scheme called the 21st-century rainbow knowledge skills rainbow. The following is Figure 1.

So that competencies can be realized, the required skills can be recognized through the vocational learning process [7,8]. Vocational School is one of vocational education which aims to produce outputs that are ready to work and create a quality workforce. Vocational education is education that is orient towards practice in the fields of carpentry, business, industry, agriculture, transportation,

services [9]. The quality of vocational education can be seen from the aspects of input, process, output, and outcome, to measure the quality of productions and outcomes, one of which graduates can work following the competence of their expertise [10] Graduates in the machining field will produce graduates who are ready to work in the industrial world, therefore the importance of establishing cooperation with the industrial world because, with the cooperation, the link and match between the school and the industrial world can be realized, industrial demand can be combined with learning to be applied in schools, so that SMK graduates can directly work in the industry. One of the vocational programs implemented by schools is industrial practice, training, and seminar workshops. [11] Collaboration is useful for schools to be able to keep up with new technological developments because industries are far more sensitive to the emergence of new technologies. However, some facts found by the industry do not play a role in the preparation of the school curriculum, so that learning in schools is still based on theories that are not in accordance with the fluctuations in absorption of vocational graduates showing demand-driven orientation of vocational education has not been fully realized, therefore the need for increased relevance of vocational education to the industrial market work [12] Soemantri argues that the relevance of education can be realized with a job profile (type and place of work) [13]. Relevance will link between job potential and the ability of graduates to meet job requirements in the industry. If graduates from vocational education cannot meet the requirements and needs set by the industry, vocational education is considered "failed" [14]. So far, schools only know that there are graduates who work, but do not know the suitability of their competency expertise, and the percentage of each student's competency learned in the school to the type of work they are involved in, this is because graduates do not include occupations in the graduate search data, other than The school also does not monitor the extent to which competencies that have been learned by students can be implemented in the world of work. Therefore it is essential to research "The level of absorption and suitability of the work field of vocational engineering graduates in the Yogyakarta region".

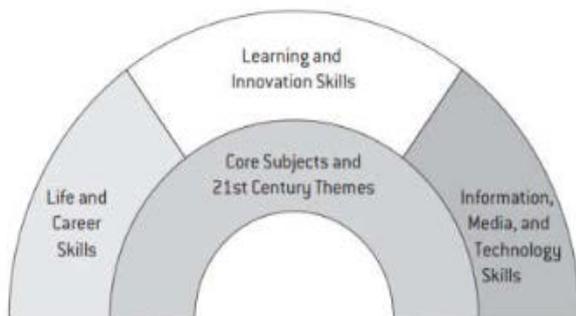


Figure 1. Rainbow 21st Century Knowledge Skills (Source: Trilling and Fadel, 2009: 47)

## 2. Research Methodology

The research method used is quantitative descriptive. Sampling was carried out using the proportional random

sampling method. Data collection techniques are done using interviews, observation, and documentation.

### 2.1. Place and Time of Research

This research was conducted in 5 (five) Machining Engineering Skills Competencies in the Yogyakarta region, namely State Vocational School 2 Yogyakarta (SMK N 2 Yogyakarta), State Vocational School 3 Yogyakarta (SMK N 3 Yogyakarta), Vocational School 1 Piri (SMK 1 PIRI Yogyakarta), Muhammadiyah Vocational School 3 Yogyakarta (SMK Muhammadiyah 3 Yogyakarta), and Industry Vocational School Yogyakarta (SMK Perindustrian Yogyakarta), Research time from August to September 2019.

### 2.2. Research Subject

The population in this study is the teacher who manages the Special job fair, the head of the engineering department program, students and teachers who handle the student industry practice program. The sampling technique in this study uses the proportional random sampling method.

### 2.3 Data Collection Technique

Data collection techniques are done using interviews, observation, and documentation.

### 2.4. Data Analysis Technique

This study uses descriptive quantitative data analysis techniques and the presentation of data using percentages.

## 3. Research Results and Discussion

### 3.1. Absorption of SMK Graduates

Specifically in the Special Region of Yogyakarta, there are 218 Vocational Schools, consisting of 50 State and 168 private. In this study, researchers focused on vocational schools that have a Machining Engineering expertise program. The Vocational School wants graduates to get jobs following the engineering majors that have been occupied while at school. The following are the results of the degree of absorption of graduates in the world of work. The following is Figure 2:

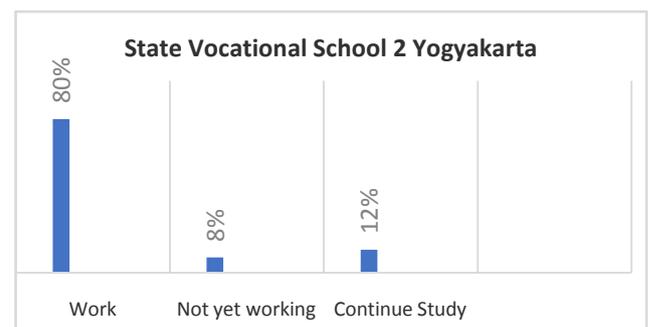
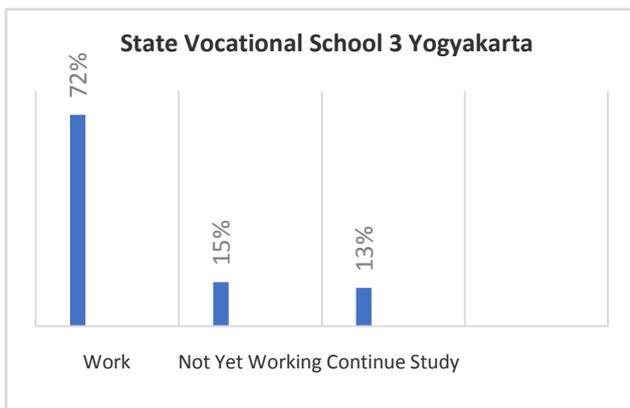


Figure 2. Percentage Absorption of State Vocational School 2 Yogyakarta Graduates

Based on data collection and interviews, the results of the data in the picture above can be explained that the number of Absorption graduates of SMK N 2 Yogyakarta, amounting to 111 students, recorded 80% of which 89 students had worked, 8% of which 9 people had not worked, and 12% of 14 people continued studies. The absorption of graduates to work is not 100%. Some students choose to continue to tertiary education, while SMK aims to create graduates to become workforce ready to work.

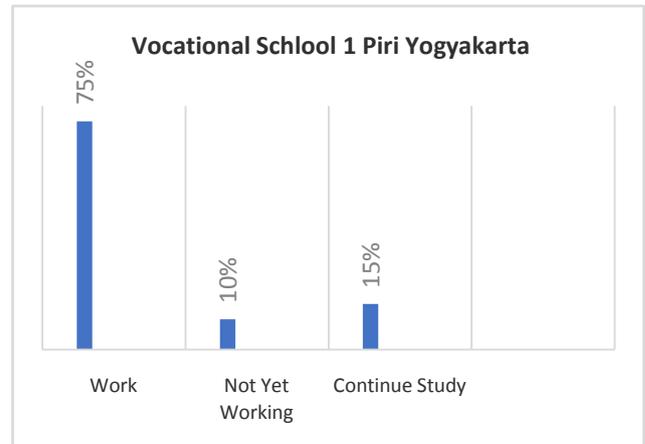
Based on interviews with students, one student said that he did not deepen machining lessons, so the learning that followed was only a formality from school, caused by internal factors of students who felt that they had wrongly majored, so students decided not to work and not continue their studies after graduating from vocational high school, the student wants to deepen knowledge about religion, for 3 years in professional high school students have not found their interest in machining majors. Based on the opinion of teachers in schools to foster student interest in working to be able to work following their fields, schools hold workshops and seminars on the World of Business and Industrial World (DUDI), directions for work in the industry and an overview and job information are also always given. The following is Figure 3:



**Figure 3.** Percentage Absorption of State Vocational School 3 Yogyakarta Graduates

Based on data collection and interviews, the results of the data in the picture above can be explained that the number of Absorption graduates of SMK N 3 Yogyakarta, amounting to 112 students, recorded 72% of which 81 students had worked, 15% of which 16 people had not worked, and 13% is 15 people continued studies. The absorption of graduates to work is not yet 100%. Based on the results of interviews in SMK N 3 Yogyakarta the teacher said that the motivation for students to want to work after graduating from SMK had been persuaded, one of which is the implementation of industrial practices. This program is expected to be able to open students' insights to work in accordance with their fields after graduating from school because there is an increase in students' skills after carrying out industrial practices, but regarding students' desire to work in industry is a decision of the students themselves, because the internal factors of students to work are different. The participation of students in industrial practice is one way to foster student interest in work, seeing the field conditions in the world of work students can decide for themselves to work. Efforts

to readiness in facing production automation in the 4.0 revolution of the school always provide an introduction and direction on technological developments and how to deal with them, and teachers still teach to be more concerned with attitude in dealing with the development of the world of work. The following is Figure 4:



**Figure 4.** Percentage Absorption of Vocational School 1 Piri Yogyakarta Graduates

Based on data collection and interviews, the results of the data in the picture above can be explained that the number of students of SMK 1 PIRI Yogyakarta has a total absorption of 24 people. The number of students at this school is select by several factors, including the internal elements of students, namely family factors that support students' motivation to be an enthusiastic school but the lack of family role is the cause of students not continuing school.

One of the teacher's contributions to increase students' absorption in the world of work is the teacher's role in encouraging students, one of which is to foster work interest, the teacher motivates students to follow industry practices that are always held in February so that students can get into work.

This school cooperates with  $\pm$  20 industries, obstacles in the implementation of industrial practices are internal factors of students who lack discipline, so some cases cause students to be excluded from industries where pre-school students are often not attending pre-school activities, and therefore not to repeat the school conducts supervision every 2 weeks to see student progress.

After following industry practices, the competency of students increases, and there is awareness to work after graduating from the vocational school. The business of schools and teachers in growing awareness to work by providing job information, the application of teaching factories in schools ranging from design, material details, manufacturing processes, to marketing is made in the hope that vocational graduates can build businesses and work right away. Profile of SMK graduates 75% of students go straight to work, 75% of them are 18 students who have worked, 10% of which two have not worked, and 15% of 4 people continue their studies. The absorption of graduates to work is not 100%. Some students choose to continue to tertiary education, while SMK aims to create graduates to become workforce ready to work. Based on the results of interviews of students who have worked there are still many that are not yet relevant to their majors,

some students work as waitresses who are not related to machining majors. The following is Figure 5:

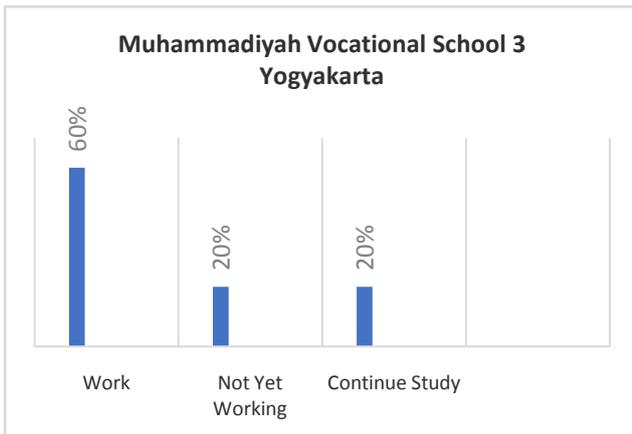


Figure 5. Percentage Absorption of Muhammadiyah Vocational School 3 Yogyakarta Graduates

Based on data collection and interviews, the results of the data in the picture above can be explained that the number absorption of SMK Muhammadiyah 3 Yogyakarta graduates, amounting to 63 people, recorded 60% of which 38 students had worked, 20% of which 13 people had not worked, and 20% of 11 people continued studies. The absorption of graduates to work is not 100%. The following is Figure 6:

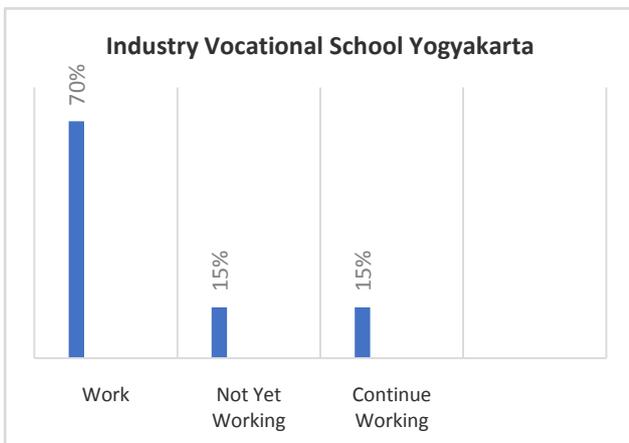


Figure 6. Percentage Absorption of Industry Vocational School Yogyakarta Graduates

Based on the data collection and interviews, the results of the data in the picture above can be explained that the number absorption of Yogyakarta Industrial Vocational School graduates totalling 80 people, recorded 70% of which 56 students had worked, 15% of which 12 people had not worked and 15% of 12 people continuing their studies. The absorption of graduates to work is not 100%.

Based on the results of interviews at the Industrial Vocational School teachers expect their graduates can immediately work following their fields after graduation, the purpose of holding industrial practices is a way for students to feel working in the industry. Some students explained that in the implementation of practices in the industry, they could add insight and abilities because, during industrial practice, many discover new tools that were not previously available in-school workshops. In the aspect of discipline and time management, students are

highly trained to be more disciplined because the industrial world is very orderly and organized for the working time applied, students can also practice how to communicate well in completing tasks required to complete on time and also learn for teamwork at work. However, what is obtained during industrial practice has not fostered the desire of students to work after graduating school. Students prefer to continue their studies and want to continue their studies while working. Students consider going straight to work because the experience gained during industrial practice is still lacking. Based on the results of interviews conducted with teachers, 20 businesses and industries were working together in the implementation of industrial practices. Students must follow the implementation of industrial practices. This implementation is expected to be able to practice skills, discipline, and increase students' insights about the working world and be able to apply the learning that students have learned at school. The teacher explains that the school wants its students to work in the industry. One of the steps taken from the school is to collaborate with several industries and offer students to work in the industry. Because of the limitations of the industry in collaboration with schools, the teacher does not have many relationships for employment information, but the teacher always offers students related work information. However, many factors make students decide not to try the job, including students not getting permission from parents, students do not want to work in an industry far from home and students prefer to continue their studies because they do not have the desire to enter the workforce. The following is Figure 7:

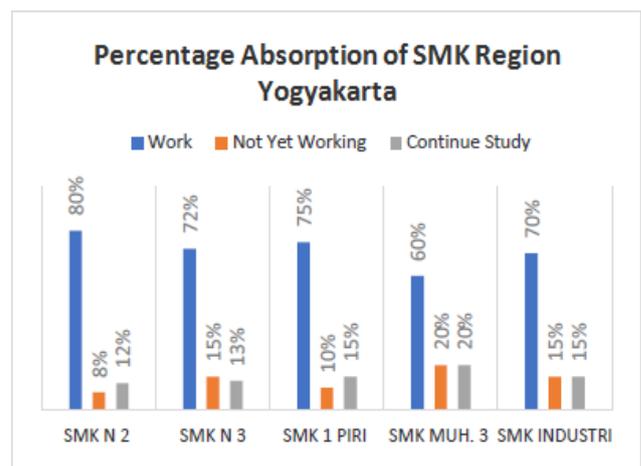


Figure 7. Percentage Absorption of SMK Region Yogyakarta

Based on the percentage of Vocational School graduates absorption in the Yogyakarta area, it can be concluded that the percentage of students absorbed in the world of work is 80%, the lowest is 60%.

### 3.2. Suitability in the Work Field

Based on the results of interviews and documents, students who have graduated from vocational school do not work by their fields, while the factors that influence are:

1. Lack of collaboration between schools and industry
2. Availability of jobs in the machining sector is still minimal

3. Students do not go deep into machining lessons, so their competency is still lacking for work
4. Internal factors of students who continue vocational high school are not because of interest but as an escape in finding a school
5. Family factors that force students to choose majors that students do not want
6. Environmental and social factors that make students decide to work with their friends
7. Students prefer to go to college because some industries accept workers who have a bachelor's degree.
8. Students who want to experience new experiences besides machining
9. The availability of the number of job vacancies not balanced with the number of SMK graduates
10. After carrying out industrial practices, some students experience work experience, which ultimately makes students not want to work following their fields.

### 3.3. School Strategy

In the face of the 4.0 revolution, the development of the era that made significant changes to the work, the automation of machines that appeared made a number of jobs lost, but with the replacement of manual workers by automatic machines, vocational students must-have skills that are not capable of being done by machines, because there will be thousands of new jobs who will wait, the number predicted 65,000 types of work [5]. The skills that must be master in the 21st century: (1) Communication, (2) Collaboration, (3) Critical thinking, and (4) Problem Solving. So that skills in the 21st century can be achieved, the teacher applies a learning strategy that is fun, and creates a variety of learning that does not wait so that students can easily accept the lesson. The strategy in creating students' insights so that they are ready to work is the school organizes machining workshops and seminars on technological developments, with the aim that students are interested and grow interested in working following the machining field.

### 4. Research Limitations

This research does not mention industries that work with schools.

### 5. Conclusion

The results of this study can be concluded that (1) the highest percentage of student absorption in the world of work is 80%, the lowest is 60%. This shows that the incorporation of Public and Private Vocational Schools in Yogyakarta is in the category of functional work readiness because more than half of them have entered the workforce, but not all vocational students work following their fields.

The causal factors that affect the discrepancy in the field of student work in the world of work are the lack of cooperation between schools and industries, the availability of jobs in the machining field is still minimal,

students do not go deep into machining lessons, so the competencies possessed are still lacking to work, internal factors of students who were continuing vocational school not because of interest, but as an escape in finding a school, family factors that force students to choose majors that students don't want, to apply for jobs in the industry itself must pass the ability test stage, some students try but fail due to lack of competitiveness, environmental and social factors that make students choose work with their friends, students prefer to continue their studies because some industries accept workers who have a S1 degree, students who want to experience new experiences besides machining, the availability of the number of job vacancies the spelling is not balanced with the number of SMK graduates, after implementing industrial practices some students feel work experience that ultimately makes students not want to work in accordance with their fields. (2) The strategy in dealing with technology mining is always carried out by schools to maintain and increase the absorption and relevance of graduates by creating learning variations that support the needs of 4C skills implementing a fun learning strategy, the school also organizes workshop activities and machining seminars on technological development, with the goal, is that students are interested and growing interested in working in accordance with the machining field.

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