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The Relevance of the Curriculum of Vocational High School (SMK) In Machining Engineering to the Needs of the Industrial Workforce in The Yogyakarta

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ABSTRACT: This study aims to: (1) Analyze the core competencies of the 2013 Curriculum in Mechanical Engineering taught at vocational schools (SMK), (2) Analyze the competency requirements of the workforce in the industry, (3) Compare the relevance of core competencies in Mechanical Engineering at SMK with the competency requirements of the industry workforce. This is a qualitative descriptive study. The validity of the research instrument was assessed internally by expert lecturers and externally by the industry representatives of PT. Sinar Mulia Teknalum and PT. Harimukti Teknik. The study subjects consisted of four industries in the Special Region of Yogyakarta, namely PT. Yogyakarta Presisi Tehnikatama Industri, PT. Harimukti Teknik, PT. Madani Technologi, and PT. MBG Putra Mandiri. Data collection was carried out using observation, questionnaires, and interviews. The data obtained was analyzed qualitatively and descriptively. The study results indicate that: 1. The core competencies of the 2013 mechanical engineering curriculum taught in vocational schools include (a) Technical Drawing competency, taught at SMK at 93.3%, (b) Basic Mechanical Work competency, taught at SMK at 88%, and (c) Mechanical Engineering Design competency, taught at SMK at 35%. 2. The Mechanical Engineering curriculum at SMK aligns with industry workforce requirements in the Special Region of Yogyakarta. Research results show that Technical Drawing competency is categorized as 45% Highly Relevant and 55% Relevant. Basic Mechanical Work competency is 80% Highly Relevant. Mechanical Engineering Design competency is categorized as 93.7% Relevant.

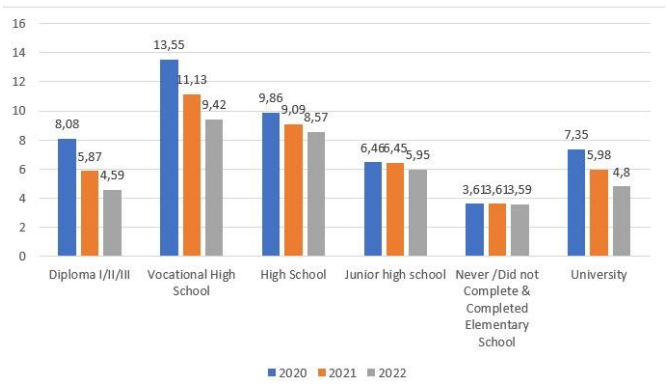
KEYWORDS: Relevance, Curriculum, Workforce Needs in the Industrial Sector

I. INTRODUCTION

The Republic of Indonesia Law No. 20 of 2003 on the National Education System, Article 1, defines education as a learning process aimed at developing skills, knowledge, and attitudes. According to Article 14 of Law No. 20 of 2003, education levels include basic education (elementary schools, Islamic elementary schools, junior high schools), secondary education (high schools, Islamic high schools, vocational high schools), and higher education. Vocational High Schools (SMK) are a form of secondary education designed to prepare students for direct entry into the workforce upon graduation. A good SMK is one that adapts its curriculum to meet the needs of the job market (Arifin, 2017).

According to information from the National Statistics Agency (BPS), vocational high schools remain the top contributors to unemployment in Indonesia. BPS data from 2021-2022 (Figure 1) shows that open unemployment is still dominated by SMK graduates, with an open unemployment rate of 11.13% among SMK graduates, followed by high school graduates.

Picture 1. Open Unemployment Rate in Indonesia



(source:www.bps.go.id)

Looking at the data above, it shows that the highest percentage of open unemployment is still from vocational school graduates. The data indicates that vocational school graduates are still not optimal in absorption into the workforce. The findings from data at four special job fairs for vocational school graduates in Yogyakarta show that 35% of graduates, which is 207, are working in fields that do not match their expertise.

Date from a tracer study by DIY's Department of Education, Youth, and Sports on jogja.com revealed that 47% of the 28,000 vocational high school graduates in 2019-2020 were successfully employed. This condition suggests a discrepancy between the anticipated and real standard of vocational high school graduates (Kumari, 2020). Vocational education institutions have failed to supply the industry with the necessary workforce. Vocational high school graduates need to possess job readiness and be capable of implementing the practical skills they gained in their education (Irfansyah et al., 2023). In order to solve this problem, there must be a harmonization between the labor market and vocational schools, one approach is to engage the industry in shaping the curriculum at vocational high school to create a link between the school's curriculum and the industry's workforce requirements. The goal of the collaborative curriculum with the industry is to create a program that prepares graduates for successful entry and advancement in the workforce (Mativo, 2005). The meaning of relevance is about the correlation or link. There are two types of relevance: internal and external. Internal relevance refers to the continuous connection between goals, content, delivery methods, and assessment to ensure seamless integration among these elements. External relevance pertains to being in sync with the requirements of the community according to Nana Syaodih Sukmadinata (2007). Relevance within the curriculum involves how all educational activities interact with learners (Jatmoko, 2013). According to past views, it can be inferred that relevance involves the connection and backing of one thing by another. Therefore, the vocational high school curriculum must align with the industry's workforce demands to aid production activities.

Competent labor is necessary for the smooth operation of the production process in the industry. Skilled labor pertains to people who have the capability to create products or services for their own use and for the general public. Industries require employees with strong academic abilities as well as proficient practical skills (Russell, 2018). Labor refers to individuals who can work and complete tasks to produce goods for both themselves and others, meeting various needs. The Ministry of Labor describes labor as human capital working for a company or entity, whether in formal or informal areas (www.kemnaker.go.id/definisi-tenaga-kerja/). Ultimately, a laborer is an individual who has the physical ability to engage in tasks that result in the creation of goods or services to fulfill personal and societal demands.

After analyzing the data provided, researchers discovered a mismatch between the curriculum issues and workforce requirements. As a result, they decided to investigate the alignment of the 2013 enginering vocational high school curriculum with the industry workforce needs in Yogyakarta.

II. METOD

This research method is qualitative and descriptive, involving data collection through questionnaires, observations, and interviews. This study explores how well the machining engineering vocational high school curriculum aligns with the industry's workforce requirements. The research plan includes three phases: input, process, outcome. The initial step includes evaluating the fundamental skills taught in machining engineering vocational high schools following the 2013 curriculum. The first step involves assessing the skill requirements of the workforce within the sector. The final phase assesses how well the 2013 machining engineering curriculum aligns with industry workforce requirements.

III. DATA COLLECTION TECHNIQUES AND INSTRUMENTS

The research utilizes data collection methods such as questionnaires/surveys, observations, and interviews. Questionnaires involve providing respondents with a set of written questions or statements to answer, as a method of collecting data (Sugiyono, 2008).

Qualitative descriptive statistics are utilized for data analysis. Descriptive statistical methods are utilized in this research to describe or collect data. Both the ideal mean standard (Mi) and ideal standard deviation (SDi) are utilized for identification purposes.

The guidelines for classifying values in the instrument are described in the table 1 below:

Table 1. Guidelines for Classifying Instrument Value Formula

NO	RENTANG NILAI	KATEGORI
1	$x > Mi + 1{,}5\ SDi$	Very Needed / Very Relevant
2	$Mi \leq x \leq Mi + 1{,}5\ SDi$	Needed / Relevant
3	$Mi - 1{,}5\ SDi \leq x < Mi$	Just needed / Quite relevant
4	$X < Mi - 1{,}5\ SDi$	Not needed / Not relevant

Keterangan :

Mi = Ideal average
= ½ x (Highest Score + Lowest Score)
= ½ x (4+1)
= ½ x (5)
= 2,5

SDi = Ideal Standard Deviation
= 1/6 x (Highest Score - Lowest Score)
= 1/6 x (4-1)
= 1/6 x (3)
= 0,5

Based on the calculation formula above, the level of relevance can be seen in the table 2 scores below:

Table 2. Calculation formula of research results

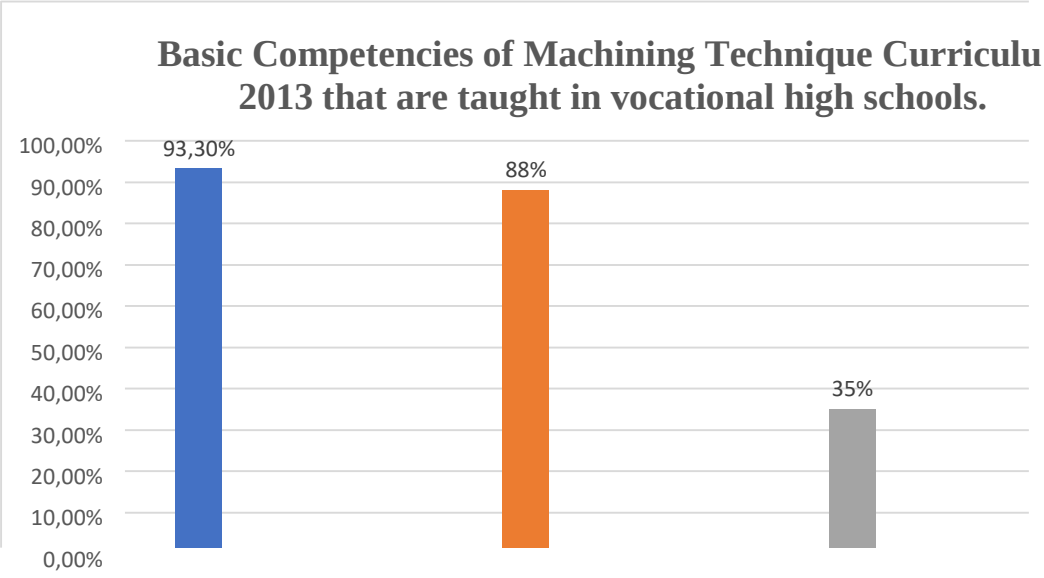
NO	RENTANG NILAI	KATEGORI
1	x > 3,25	Very Needed / Very Relevant
2	2,5 ≤ x ≤ 3,25	Needed / Relevant
3	1,75 ≤ x < 2,5	Just needed / Quite relevant
4	X < 1,75	Not needed / Not relevant

IV. RESULT AND DISCUSSION

A. RESULT

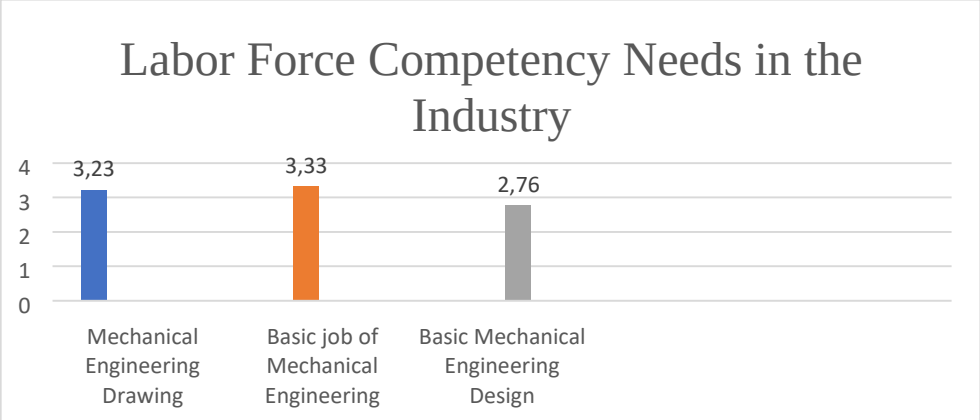
1. Basic Competencies of the 2013 Curriculum Machining Techniques taught in Vocational Schools:
   a. Based on research results, the basic competency of Machine Drawing Techniques taught in machining engineering vocational schools, with an average result of 93.3%.
   b. The basic competency of Basic Mechanical Engineering Work taught in machining engineering vocational schools is 88%.
   c. The Basic Design Competency of Mechanical Engineering (PDTM) taught in Machining Vocational Schools is 35%.

Picture 1. Basic Competencies of the 2013 Curriculum Machining Techniques taught in Vocational High School.



2. Labor Force Competency Needs in Industry :
   a. Basic competencies in Mechanical Engineering Drawing needed by the industry
      Based on the calculation results of research data, the average value for basic Engineering Drawing competencies is 3.28 and falls into the category of Very Relevant/Highly needed in the industrial world.
   b. Basic competencies in basic Mechanical Engineering Jobs received an average value of 3.33 with the category of Very Relevant/Highly needed in the workforce.
      The basic competencies that fall into the Very Relevant category are 80% because the scope of work in the manufacturing industry is closely related to these basic competencies.
   c. Basic competencies in Mechanical Engineering Design obtain an average value of 2.76 which falls into the category of Needed/Relevant. The basic competencies that fall into the category of Highly needed are 5%.

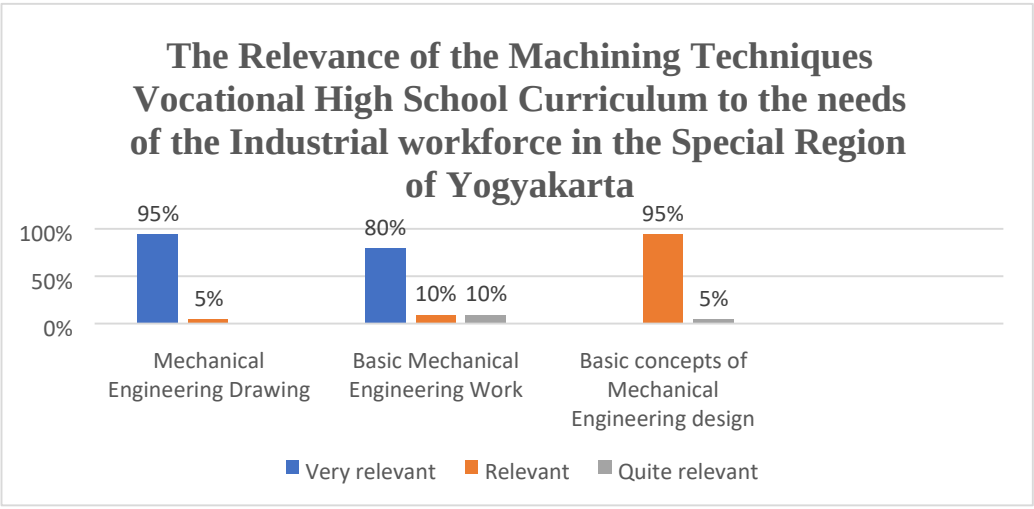
Picture 2. Competencies of Workforce Needs in the Industry



The relevance of the Vocational High School (SMK) Machining Engineering curriculum with the needs of the industrial workforce in the Special Region of Yogyakarta is categorized as relevant as follows:

   d. The competency of Mechanical Engineering Technical Drawing falls into the category of Very Relevant to the needs of the workforce in the Industry.
   e. Competency of Basic Mechanical Engineering Jobs are 80% very relevant, 10% relevant, and 10% Quite Relevant.
   f. Basic Mechanical Engineering Design competency is 5% in the Quite Relevant category, and 95% in the Relevant category.

Picture 3. Relevance of the Machining Technical Vocational School Curriculum to the Needs of Industrial Workers in Yogyakarta



CONCLUSIONS

In general, the relevance of the Vocational High School (SMK) Machining Engineering curriculum taught at SMK is aligned with the requirements of the Industry World. Therefore, SMK is capable of graduating suitable workers for the industry. Skills that are currently important in the business world need to be preserved and enhanced. Skills that are adequate or not as important must be given special focus by the school.

Furthermore, certain skills from the business sector must be incorporated into school curricula.

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