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The Effect of Industrial Practice Experience on Student's Work Readiness of Machinery Engineering Vocational School

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ABSTRACT

This study aims to reveal the effect of industrial practice experience on the job readiness of vocational engineering mechinery students in Yogyakarta. This type of research is ex-post facto with a correlational approach. The subjects in this study were all students of machining engineering expertise program at Vocational High School Yogyakarta, with a total of 297 students. Determination of sample size using the Isaac & Michael table, obtained a sample of 247 students. Sampling with purposive sampling technique and data collection using a questionnaire. The data analysis technique used is descriptive statistics to describe the data of each variable and the regression analysis used for hypothesis testing. Based on the analysis and hypothesis testing, it can be concluded that the hypothesis has a positive and significant effect between industrial practice experience on the work readiness of students of Mechanical Engineering Vocational School in Yogyakarta. It can be seen from the regression results and the results of the significance of industrial practice experience on student work readiness, the correlation coefficient (r) is 0.677 and the coefficient of determination (r2) is 0.459. The results of this study indicate that the experience of industrial practice has a positive and significant effect on the work readiness of Mechanical Engineering students at Mechanical Engineering Vocational School in Yogyakarta.

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A. INTRODUCTION

Entering the era of revolution 4.0, the role of education in Indonesia is required to maximally create quality human resources by utilizing media and learning resources that are creative, critical thinking and innovative. The large number of people but the low quality of human resources is a burden for Indonesia (Baiti & Sudji, 2018). Education is one of the government's focuses in realizing the welfare of Indonesia, Education is a conscious effort to develop the potential of human resources through teaching and learning activities (Larosa & Munadi, 2019). Vocational High School is a level of education that prepares students to become human resources who are ready to work with knowledge, skills and work attitudes in certain fields according to the needs in DUDI (Business World and Industrial World) (Indriaturrahmi, 2016).

Learning in Vocational Schools is able to equip students with specific field expertise competencies so that outputs are ready to work, confirmed in Law No. The output of SMK in Indonesia is currently the highest contributor to unemployment at 11.13% (BPS, 2021). The problem of SMK output which still dominates the unemployment rate in education is the main focus. Factors that affect the unemployment of vocational school students in Indonesia include: (1) the lack of availability of job opportunities, especially for vocational students who already have provisions in practice and are ready to work but job positions have begun to be replaced by production automation, (2) lack of relationship and cooperation between vocational schools and the world. Business and Industry (DUDI), which functions to transfer technology and knowledge regarding the development of DUDI, and with the cooperation can build an industrial culture within the SMK environment, (3) the industrial world not only accepts the best SMK graduates but also considers SMK graduates who have BNSP certificate as evidence that students are competent in their fields, therefore students who do not meet the DI criteria will find it difficult to determine job opportunities in accordance with their fields, thus students are required to have skills and are professional in their fields, (4) lack of information regarding the Industry that should be accessible according to the student's field SMK, (5) the lack of interest of SMK students to directly continue working in DUDI, (6) lack of skills of vocational students in practice, (7) students who have apprenticed there are still many who are unemployed. (8) Vocational high school is a level of education that collaborates symbiotically with the needs of the world of work, but the facts on the ground both have their own interests (Hidayati, Barr, & Sigit, 2021).

The problem of SMK output which still dominates the unemployment rate in education is the main focus. In responding to the challenges for Vocational High Schools, one of the efforts made by the government is a competitive Vocational School with the internalization of entrepreneurial values which aims to train Vocational High School students to have an entrepreneurial spirit. Interest so that the output of Vocational High Schools can create their own jobs and provide skills that are in accordance with their fields (Kuat, 2017). Being skilled in industrial sector and having ability according to their field of expertise is main objective of implementation of vocational education (Prayogo, Hermanto, Widiatmaka, Prasetyo, & Sugiyarto, 2022).

To produce vocational graduates who are ready to work and improve human resources for employment. One of the strategies adopted by schools is to organize vocational education innovations in the form of industrial practice activities that require students to do internships (internships) in industries that are relevant to their expertise. Industrial practice is carried out within a specified period of time, in general students study in school for 6 months (1 semester) and 6 months of industrial practice, this system is called a dual system because the application of learning takes place in 2 places, namely in industry and in school. The system implemented aims to train students' skills, abilities, and time management in preparing themselves for the world of work. Through the implementation of Industrial work practices (internships), vocational students will get real experience in work in accordance with their field of expertise (Rohman, 2020). Industrial work practices (internships) are productive activities carried out in the industry directly and aim to hone skills and develop theory or knowledge that has been acquired in school. So that industrial work experience (internship) has a definition as student activities who have or have done directly in the industry to develop knowledge and hone skills (Handayani, Susila, & Wailanduw, 2019).

However, the readiness of students to go directly into the industrial world can be another obstacle for this program because of the low students' level of understanding of work culture

company. This can be seen from their unpreparedness and lack of self-confidence can ultimately affect them in learning registration (Dewi & Kamdi, 2018). According to (Pratama, Daryati , & Arthur, 2018) job readiness is an ability possessed by students to be able to work immediately after graduating from SMK, which includes physical maturity, mental maturity, and experience gained. The readiness of students to enter the world of work is the ability that students must have to carry out a job or task that is based on professional skills and knowledge and is supported by the work attitude demanded by the work that students will be involved in. (Husnita & Suparno, 2020). Job readiness is influenced by students' personal external and internal factors (Indra, Evanita, & Dwita, 2019). External factors are outside the student's personality, and internal factors are inside the student's personality. Students' external factors are the school environment and family environment that have an influence on students' work readiness, while students' internal factors are work motivation, student interests, and ideals. The school environment is a Vocational High School where students learn to have knowledge, skills and be mentally ready to work. (Ahkyat, Munadi, Nuchron, & Rohmantoro, 2019). In the process of industrial work practices to get new knowledge that is not taught in the relevant vocational institutions. Based on the explanation above, the indicators of industrial practice experience in this study are: (1) Hard Skills: Industrial practice trains students' practical skills and provides experience about the industrial world; and (2) Knowledge (Soft Skill): Can diagnose problems encountered in the field by applying the theory of knowledge that has been obtained during the learning process at school. It is still found that students who work are not in accordance with their field of expertise who have carried out industrial practice, the absorption of students to work has not reached 100%. Some students choose to continue their studies, as has been explained that the purpose of SMK is to meet the needs of the industry, this is certainly a problem faced by SMK in Yogyakarta, Therefore based on the survey that has been done, this research is important to do. Determine the effect of industrial practice on the work readiness of students of vocational high school majoring in engineering.

B. METHODS

This type of research is ex-post facto with a correlational approach. Ex-post facto research is often referred to as after the fact, namely research that carried out after the occurrence/fact, this research takes place when the variable has occurred, the researcher begins to observe the dependent variable. This research is quantitative research, because the measurement of statistical data through scientific calculations derived from the sample of students studied. This research was conducted at the Yogyakarta City Vocational School which has a Mechanical Engineering expertise. The population in this study were all students of SMK Class XII Mechanical Engineering skill program at SMK Yogyakarta. This study uses a sampling technique by proportional random sampling, the formula used is:

$$s = \frac{\lambda^2.\mathrm{N.P.Q}}{d^2(N-1)+\lambda^2.\mathrm{P.Q}} \quad (1)$$

with s = Number of samples; λ^2= Chi Square, with dk = 1, error level 1%, 5%, and 10%; λ^2 = 3.841. Based on the formula, samples can be obtained from each school, namely as shown in Table 1.

Table 1. Table of Research Sample

No	School	Population	Sample
1	School A	107	107×83%= 89
2	School B	101	101×83%=84
3	School C	63	63×83%=52
4	School D	26	26×83%=22
	TOTAL	297	247

Based on table 1, so the number of sample is 247 students. The item analysis in this research instrument was tested using the help of software SPSS (Statistical Package for the Social Sciences) version 25. Total the respondent is 247, then the rtable value can be obtained through the r table Pearson's product moment with df (degree of freedom) = n-2, then df = 247-2 = 245. r table = 0.125.

1. Data collection technique

a. Interview

The interview technique was used by researchers to collect pre-test data research or pre-survey. This research interview respondents interviewed by researchers to reveal the effect of practical work experience industry on job readiness student. The questions asked at the time of the interview are non-interviews structured, the questions posed by researchers can be answered freely by the respondent without being tied to a particular pattern of answers. Interviews conducted individually and face to face with time ranges from 30 minutes to 45 minutes.

b. Questionnaire

Questionnaire is a data collection technique consisting of some questions related to the problem to be researched, solved, compiled and distributed to respondents to obtain research results based on information in the field. The questionnaire used in this study is a questionnaire item closed-ended questions, the researcher provides several alternative choices answer, which is suitable for the respondent in the column provided and the respondent just chooses the answer that is closest to the choice respondent.

2. Research Instruments

As for the steps in conducting the preparation of the instrument research are as follows:

a. Create a questionnaire grid

Make a grid of questionnaires based on the research variables that have been developed into indicators

b. Arrange the question items

After making the questionnaire grid, the researcher arranges the items indicator-based questions.

3. Instrument Validity and Reliability

a. Instrument Validity

A valid instrument is a measuring tool that can be used to get the data (measure) what you want to measure. Instrument validity is an important requirement to obtain valid research results. The validity used by the researcher is construct validity (Construct Validity) and content validity (Content Validity). To test this Validity can be done using expert opinion (Experts Judgment), after the instrument is constructed with the

indicators and aspects to be measured based on certain theories, then it is then consulted with experts expert by a lecturer at the Yogyakarta State University, namely Dr. Widarto, M.Pd. and Prof. Dr. Ir Dwi Rhdiyanta, M.Pd. The item analysis in this research instrument was tested using the help of software SPSS (Statistical Package for the Social Sciences) version 25. Total the respondent is 247, then the rtable value can be obtained through the r table Pearson's product moment with df (degree of freedom) = n-2, then df = 247-2 = 245. r table = 0.125. Pearson's r product moment table attached in appendix 19. If the value of rcount > rtable product moment then the items in the questionnaire were declared valid. Meanwhile, if the value of rcount < rtable product moment, the questionnaire items are declared invalid. The results of the validity analysis are obtained as follows: There are 6 industrial practice experience instruments with results SPSS. The results of the analysis are known from 6 items The questions tested are all valid.

b. Instrument Reliability

A reliable instrument is an instrument which, when used, several times to measure the same object, will produce different data same. The results of the reliability analysis are obtained as shown in Table 2.

Table 2. Instrument Reliability Analysis Results

No.	Instrument Variable	Coefficient Alpha	Description	Consistency
1.	Job Readiness (Y)	0,914	Reliable	Excellent
2.	Industrial practice experience (X)	0,718	Reliable	Excellent

The results of the analysis in Table 2 show that the Y variable has a value of Cronbach Alpha of 0.914 means it has a very high reliability value good (Excellent). Variable X has a Cronbach Alpha value of 0.718 means that it has an acceptable or sufficient reliability value (Acceptable).

4. Test Requirements Analysis

a. Normality test

In this study, the Kolmogorov . normality test was used Smirnov, this is to check whether the population is normally distributed or no. If the calculated significance value is greater than the significance level 0.05 (5%), then the data obtained are spread in a normal distribution. Based on the results of the SPSS output normogrov-Smirnov test shows the Asymp value. Sig. (2-tailed) 0.200 > 0.05, then it can be it can be concluded that the residual values of all variables have a normal distribution

b. Linearity Test

Linearity is done by Test for Linearity at a significance level of 5%. Decision making if the value of Sig Deviation from Linearity is greater from 5% then between the independent variable and the dependent variable have a linear relationship. Based on the results of the linearity test the value of sig. deviation from linearity industrial work experience variable (X) on readiness variable work (Y) that is equal to 0.76 > 0.05, it can be concluded that there is a linear relationship between the variables independent and dependent variable.

c. Multi-collinearity test

Destination multicollinearity test is to determine the correlation or the relationship between the independent variables. To detect the presence of multicollinearity in the multiple linear regression model can be used the value of VIF (Variance Inflatio Factor) and tolerance (TOL) provided that if VIF value exceeds 10, then there is multicollinearity in the model regression. If the TOL value is equal to 1, then there is no multicollinearity in the regression model. Based on the table of multicollinearity test results can be proven through the Correlation table which shows the correlation value between independent variables X1 of r = 0.587, then no multicollinearity symptoms detected with r less than 0.8, coefficient table a low standard error value is less than one, namely X1 = 0.231, so there is no multicollinearity based on standard errors. It can be concluded that the variable practical experience industrial work (X) has a tolerance value of 0.655 which means the value of tolerance > 0.10 and the VIF value of 1.527 which means the VIF value < 10, then the independent variable does not occur multicollinearity.

d. Hypothesis testing

Hypothesis testing aims to prove that the answers or presumptions while supported by empirical data. In this study the hypothesis test the first to the third is done by simple regression analysis, test the fourth hypothesis was carried out by multiple regression analysis, as shown in Table 3.

Table 3. Hypothesis Table Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	42.267	4.264		9.913	.000
	X	3.067	.213	.677	14.416	.000
a	Dependent variable: Y					

Based on the results of SPSS output in Table 3 then it can be explained that the value of Constant (a) is 42.267, the value of the practice experience variable industry (b) of 3.067 so that the regression equation can be described as follows:

1) The constant of 42.267 states that the value of the experience variable industrial practice is 42,267.
2) The X1 regression coefficient of 3.067 states that each an additional 1% of the value of industrial practice experience, then the value of the participants increased by 3,067. The regression coefficient is positive, so that the direction of the influence of the variable X on Y is positive.
3) Based on the significance value in the first hypothesis table, it is obtained sig value. Of 0.000 < 0.05. So it can be concluded that the variable X effect on variable Y. Based on the t value in the first hypothesis table, the t-count. Value is obtained of 14,416 > 0,2 t-table, the calculation of the value of t-table (α = 0.05 level of significance 5%) is attached to attachment 26. So it can be concluded that industrial practice experience variable (X) has an effect on the variable work readiness (Y).

C. RESULT AND DISCUSSION

The purpose of this study was to analyze the effect of industrial practice experience on the job readiness of Mechanical Engineering Vocational High School students. In accordance with the purpose of the study, the researcher took data and analyzed it to determine the effect of industrial practice experience on students' work readiness. Based on research that has been conducted on mechanical engineering vocational high school students, the results show that students' industrial practice experience has the criteria in Table 13 which is very high at 59%, which has a high criterion of 36%, which has a low criterion of 5%, this shows that industrial practice experience Mechanical engineering vocational school students in Yogyakarta are included in the very high category, but have not reached 100%.

The following is the research data described regarding the description of research data including the mean (mean), median (Me), mode (Mo), standard deviation (SD), and frequency distribution as well as diagrams of all variables and testing the first, second, and third hypotheses. along with testing the analysis requirements which include normality test, linearity test, multicollinearity test. Collecting data on the variable of research work readiness using a questionnaire which consists of 31 questions, the score of each respondent is grouped in 4 categories, namely very high, high, low and very low with a total of respondents 247 students.

The ideal highest score is 4, the way to analyze it is the highest scale which is 4 multiplied by the number of question items totalling 31, then the result from the highest maximum score is 124. For the ideal minimum score is a scale the lowest is 1 multiplied by the number of questions totalling 31, then the result of the lowest maximum score is 31. Data processing using software assistance SPSS (Statistical Package for the Social Sciences) version 25. The mean is 103.30, the median is 103.00, the mode is 103, and the standard deviation is 10.871. Then the mean variable of work readiness of 103.30 is included in the very high category. The following is a work readiness frequency distribution table, as shown in Table 4.

Table 4. Table of Work readiness frequency distribution

NO.	Criteria	Interval	Frequency	Percentage
1.	Very High	124,00-100,75	140	57%
2.	High	100,75-77,5	104	42%
3.	Low	77,5-54,25	3	1%
4.	Very Low	54,25-31	0	0%
	TOTAL		247	100%

Based on Table 4, it can be seen that the data on the distribution of work readiness of Mechanical Engineering SMK students in the Yogyakarta area is 57% in the very high category, 42% in the high category, 1% in the low category, and no students in the very low category. Based on the results of this analysis, it can be concluded that students' work readiness is at a very high criterion.

Data collection on the variable of the researcher's industrial practice experience using a questionnaire consisting of 6 questions, the score of each respondent grouped into 4 categories, namely very high, high, low and very low with the number of respondents 247 students. For the highest ideal score is 4, the way to analyze it is a scale the highest is 4 multiplied by the number of questions totaling 6, then the result of the highest maximum score is 24. For the ideal minimum score is the lowest scale is 1 multiplied by the number of questions totaling 6, then the result of the lowest maximum score is 6.

Data processing using software assistance SPSS (Statistical Package for the Social Sciences) version 25. Mean of 19.90, Median of 20.00, Mode of 20, and standard deviation of 2,401. then the mean practice experience variable industry of 20.00 is included in the very high category. The table below shows industrial practice experience variable frequency distribution, as shown in Table 5.

Table 5. Table of frequency distribution of industrial practice experience variables

NO	Criteria	Interval	Frequency	Percentage
1	Very High	24-19,5	145	59%
2	High	19,5-15	89	36%
3	Low	15-10,5	13	5%
4	Very Low	10,5-6	0	0%
TOTAL			247	100%

Based on the analysis and hypothesis testing, it can be concluded that the hypothesis has a positive and significant effect between the experience of industrial practice on the work readiness of students of Mechanical Engineering Vocational School in Yogyakarta. This can be seen from the regression results and the results of the significance of industrial practice experience on student work readiness, the correlation coefficient (r) is 0.677 and the coefficient of determination (r2) is 0.459. Based on the results of relevant research, Industrial Practice is a preparation stage that aims to develop students' abilities and carry out responsibilities in their fields (Pratama, Daryati , & Arthur, 2018) .

D. CONCLUSION AND SUGGESTIONS

Based on the results of data analysis of the effect of industrial practice experience on the work readiness of students of Mechanical Engineering Vocational High School in Yogyakarta, it can be concluded that the hypothesis has a positive and significant effect between industrial practice experience on the work readiness of students of Mechanical Engineering Vocational School in Yogyakarta. It can be seen from the regression results and the results of the significance of industrial practice experience on student work readiness, the correlation coefficient (r) is 0.677 and the coefficient of determination (r2) is 0.459. The results of this study indicate that the experience of industrial practice has a positive and significant effect on the work readiness of Mechanical Engineering students at Mechanical Engineering Vocational School in Yogyakarta.

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REFERENCES

Ahkyat, F., Munadi, S., Nuchron, & Rohmantoro, D. (2019). The Effect of Industrial Work Practices on Students 'Readiness at the High School of Vocational Partners PT. Astra Daihatsu Motor. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)* , 1383-1387.

Baiti, A., & Sudji, M. (2018). Pengaruh pengalaman praktik, prestasi belajar dasar kejuruan dan dukungan orang tua terhadap kesiapan kerja siswa SMK. . *Jurnal Pendidikan Vokasi*, 164-180.

BPS, B. (2021). *Tingkat Pengangguran Terbuka (TPT).* BPS - Statistics Indonesia.

Dewi, D. M., & Kamdi, W. (2018). The Effectiveness of Industrial Work Practice in Preparing the Capabilities of Students to Enterthe Business, Industrial World (DUDI) and Industrial Revolution 4.0. *ATLANTIS PRESS Advances in Social Science, Education and Humanities Research, volume 242*, 95-99.

Handayani, N., Susila, W., & Wailanduw, G. (2019). Influence of Experience in Industrial Work Practices on Students' Work Readiness Light Technology Vehicle Engineering at Indomobil Nissan Datsun East Java in 2019. *International Journal for Educational and Vocational Studies Vol. 1, No. 7, November 2019, pp. 697-701*, 697-701.

Hidayati, A., Barr, F. D., & Sigit, K. N. (2021). Kesesuaian Kompetensi Lulusan SMK dengan Kebutuhan Dunia Usaha dan Industri . *Ekuitas: Jurnal Pendidikan Ekonomi*, 284-292.

Husnita, & Suparno. (2020). Pendidikan Karakter dan Prakerin Berpengaruh Terhadap Kesiapan Siswa Memasuki Dunia Kerja. *Jurnal Pedagogi dan Pembelajaran*, 428-438.

Indra, L., Evanita, S., & Dwita, S. (2019). The Impact of student's Industrial Work Experience, Career Guidance and Career Motivation on Job Readiness: Case Study on Vocayional Student in Solok. *Atlantis Pres Advance in Economics, Business and Management Research, 2nd Padang International Conference on Education Economic, Business and Accounting* , 334-343.

Indriaturrahmi. (2016). Peran Dunia Usaha dan Dunia Industri dalam Penyelenggaraan SMK Berbasis Kearifan Lokal di Kota Mataram. *Jurnal Pendidikan Vokasi*, 162-172.

Kuat, T. (2017). Penumbuhkan Jiwa Kewirausahaan Melalui Implementasi Edupreneurship di Sekolah Menengah Kejuruan. *Seminar Nasional Pendidikan*, 130-143.

Larosa, E., & Munadi, S. (2019). Level of Absorption and Suitability in the Field of Machining Work among Vocational School Graduates in Yogyakarta Region. *American Journal of Educational Research*, 859-864.

Pratama, Y., Daryati , & Arthur, R. (2018). Hubungan Praktik Kerja Industri dengan Kesiapan Kerja Siswa SMK Negeri 1 Cibinong Kelas XII Kompetensi Keahlian Teknik Gambar Bangunan. *Jurnal PenSil*.

Prayogo, D., Hermanto, A. W., Widiatmaka, F., Prasetyo, D., & Sugiyarto. (2022). The Effect of Practical Experience, Knowledge of Job Opportunities,Teacher Professionalism and Work Motivation on Work Readiness. *Jurnal Iqra' Kajian Ilmu Pendidikan*, 204-218.

Rohman, T. (2020). Kesiapan Kerja Siswa SMK Ditinjau dari Kinerja Prakerin. *JUPITER (Jurnal Pendidikan Teknik Elektro)*, 22-27.