THE EFFECT OF MACHINING PRACTICAL ACHIEVEMENT, INDUSTRIAL WORK PRACTICE AND VOCATIONAL GUIDANCE ON WORK READINESS OF MECHANICAL ENGINEERING STUDENTS OF VOCATIONAL HIGH SCHOOL IN KARANGANYAR

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ABSTRACT

The purposes of this study were to find out: (1) The effect of machining practical achievement on work readiness; (2) The effect of industrial work practice on work readiness; and (3) The effect of vocational on work readiness of vocational high school students in Karanganyar.

This study was ex-post facto research with quantitative descriptive research. The population was 592 students from the XII grade of Mechanical Engineering study program of Vocational High School in the academic year of 2018/2019. The sample used was 234 students. This research used a probability sampling technique. The data were collected through questionnaires and documentation. The data analysis technique used simple regression analysis.

The results of this study were: (1) The machining practical achievement has a positive and significant effect on work readiness with a value of 56.5%; (2) Industrial work practice has a positive and significant effect on work readiness with a value of 52.7%; (3) Vocational guidance has a positive and significant effect on work readiness of vocational students in Karanganyar with a value of 32.8%.

KEYWORDS: practical achievement, industrial work practice, vocational guidance

INTRODUCTION

Vocational High School (called SMK) is one of the formal education levels organized to prepare middle-class labor candidates in entering the workforce with various expertise competencies. This is in line with the National Education System Law 2003 article 15 that "Vocational education is secondary education that prepares students to work in certain fields".

According to Central Bureau of Statistics (called BPS) data related to the number of unemployed people based on education level, it was found that in February 2018, there were 6.8 million unemployed people in Indonesia in which the Open Unemployment Rate (called TPT) for vocational education was the second highest after high school.

Table 1. Unemployment Statistics in Indonesia by Education Level

Education Level	2016		2017		2018
	February	**August**	**February**	**August**	**February**
No/ Never school	94293	59346	92331	62984	42039
No/ Not completed in Elementary School	557418	384069	546897	404435	446812
Elementary School	1218954	1035731	1292234	904561	967630
Junior High School	1313815	1294483	1281240	1274417	1249761
Senior High School	1546699	1950626	1552894	1910829	1650636
Vocational High School	1348327	1520549	1383022	1621402	1424428
Academy/Diploma	249362	219736	249705	242937	300845
University	695304	567235	606939	618758	789113
Total	7024172	7031775	7005262	7005262	6871264

Source: Central Bureau of Statistics

From table 1, one of the factors causing unemployment of vocational school graduates in Indonesia is student work readiness. Work readiness is also expected to accommodate one's potential through talent and skills bymastery of competencies and career abilities (Caballero & Walker, 2010). The work readiness of each graduate must include the understanding, relevance, quality, behavior, culture, and ideology of each graduate (Jackson, 2016).

In teaching and learning activities in Vocational High School, the machining practical achievement is one of the achievements. In other word, achievement as a standard and as an academic result is determined according to the absolute category or comparison in the curriculum of a subject (Hawkins, 2007: 28) (Setiawati, 2015). The achievement of vocational competence is one of the achievement forms in students' vocational practice.

Achievement can be supposed to be a standard and academic results decided absolutely with the criteria in the curriculum of a subject (Hawkins, 2007). Work-Based Learning Approach (WBL) is carried out through the development of meaningful constructs and real experience based on the workplace or in vocational schools known as practical training (Mardini, 2013). In line with this opinion, Richard (2013) explained that WBL is a part of the learning experience.

According to (Nugraha, 2017) industrial work practices and career guidance have a positive and significant influence on student work readiness. Industrial work practice has a positive and significant influence on vocational students' work readiness (Setyawati, 2016). The theory proves that skills, knowledge, and competency are required by vocational students to work after they graduate (Heathfield, 2015).

Soft skill competence for students and graduates can be generated not only through the teaching and learning process but also through vocational guidance and career guidance (Anindo et al., 2016). Student work readiness is also influenced by vocational guidance in schools (Yustina, 2014). This leads to vocational guidance and career guidance be an important dimension in the education system in any country and society (Boglut et al., 2015).

From the explanation, this study was conducted to determine the effect of machining practical achievement, industrial work practice and vocational guidance on work readiness of grade XII students of the Mechanical Engineering study program of Vocational High Schools in Karanganyar. This study was conducted based on a reason that from the observation, work readiness of vocational students in Karanganyar Regency was lacking evidenced in table 2in which the results showed that Vocational High School graduates in several regencies were less than 70% who directly had a job after graduated.

Table 2. Observation Results of Several Vocational School Graduates in Karanganyar

School Name	Working based on the expertise	Working outside the expertise	University	Entrepreneur	Total of students
SMKN 2 Karanganyar	65 (60%)	21 (19%)	17 (15%)	5 (6 %)	108
SMK Bhina Karya	35 (56%)	13 (21%)	10 (16%)	2 (5%)	62
SMK Satya Karya	62 (55%)	27 (23%)	25 (22%)		114

METHOD

This study was an ex post facto research with a quantitative descriptive research approach. It was conducted in six vocational high schools in Karanganyar on XII grade students of the Mechanical Engineering study program consisted of Vocational High School 2 of Karanganyar, Bhina Karya Vocational High School of Karanganyar, Satya Karya Vocational High School of Karanganyar, Karya Teknika Vocationa Highl School, YP Vocational High School of Colomadu and Muhammadiyah Vocational High School of Gondangrejo with the population of 592 students. This study used probability random sampling technique to choose a sample of 234 students. The variables in this research consisted of three independent variables and one dependent variable. The independent variables were machining practical achievement (X1), industrial work practice (X2) and vocational guidance(X3). While the dependent variable influenced by the independent variable was work readiness (Y) of vocational school students.

To analyze the data, this research used simple regression analysis and multiple regression analysis with the help of SPSS 24.0 for windows. Furthermore, the research instruments were used to compile

the questionnaire based on a Likert scale. While the instrument of machining practical achievement used observation of student work results.

RESULTS

Research data in this study deal with information regarding machining practical achievement, industrial work practice, vocational guidance, and work readiness. Prior to data analysis, normality tests, linearity test, and multi collinearity test were performed as parts of research procedures.

Normality Test

A normality test is carried out to find out whether or not the variables have a normal distribution. This is used as a requirement in hypothesis testing. The normality test was carried out by using SPSS (Statistical Program for Social Science) 24.0 for windows using the Kolmogorov-Smirnov analysis technique. If Asymp. Sig (2-tailed)> 0.05, the data distribution is considered normal. The normality test results are shown in the following table:

Table 3. Summary of Normality Test Results

Variable	Asymp. Sig (2-tailed)	Significant Level	Conclusion
X_1	0,200	>0,05	Normal
X_2	0,200	>0,05	Normal
X_3	0,200	>0,05	Normal
Y	0,200	>0,05	Normal

Based on the results of the normality test above, it can be seen that the value of Asymp.Sig (2-tailed) is > 0.05, so it can be concluded that the research data have met the normal distribution criteria.

Linearity Test

The linearity test is performed to determine whether the independent and dependent variables have a linear effect or not. Linearity testing criteria are based on the assumption that if the deviance from linearity is higher than 0.0 at a significant level of 5%,the relationship between independent and dependent variables is linear. The results of the linearity test summary are presented below:

Table 4. Summary of Linearity Test Results

Variable	Significant Level	Conclusion
$X_1.Y$	0,660	Linear
$X_2.Y$	0,345	Linear
$X_3.Y$	0,694	Linear

The results of linearity test related to the significant relation between machining practical achievement (X1) and work readiness (Y), industrial work practice (X2) and work readiness, and vocational guidance(X3) and work readiness (Y) showed that each variable has a linear relationship to the dependent variable.

Multicollinearity Test

The multicollinearity test was used as a requirement for multiple regression analysis. The purpose of this test is to find out whether there is a correlation between independent variables. It is said that multicollinearity does not occur if the value of Variance Inflation Factor (VIF) <10 and the tolerance value> 10% (0.1). The calculation of multicollinearity value was done by using SPSS (Statistical Program for Social Science) 24.0 for windows. The results are summarized in the table below:

Table 5. Summary of Multicollinearity Test Results

Variable	Collinearity Statistic		Description
	Tolerance	VIF	
X_1	0,677	1,482	Not occured
X_2	0,516	1,955	Not occured
X_3	0,602	1,698	Absenced

The tolerance value of the machining practical achievement, industrial work practice, and vocational guidance variables is > 0.1 or the tolerance value is higher than 0.1, while the VIF value is <10. So, it can be interpreted that there is no multicollinearity between independent variables.

Hypothesis Testing
Simple regression analysis

Table 6. Summary of Regression Test Results

Regression	R	R square	T Statistics	Sig.
X_1 - Y	0,751	0,565	17,346	0,000
X_2 -Y	0,726	0,525	16,325	0,000
X_3–Y	0,573	0,328	10,652	0,000

Based on table 6above, it can be concluded that:

a. machining practical achievement has a significant effect on work readiness. Based on the test result, the correlation coefficient is (R) 0.751 and the value of the t-test is 17.334 which is higher than 1.651. So, the hypothesis that machining practical achievement has a positive and significant effect on work readiness is accepted.

b. Industrial work practice has a significant effect on work readiness. Based on the test results the correlation coefficient (R) is 0.751 and the value of the t-test is 16.325 and higher than 1.651. The

hypothesis that industrial workpractice has a positive and significant effect on work readiness is accepted.

c. Vocational guidance has a significant effect on work readiness. Based on the test results the correlation coefficient is (R) 0.751 and the value of t-test is 10.652 which is higher than 1.651. The hypothesis that machining practical achievement has a positive and significant effect on work readiness is accepted.

DISCUSSION

1. The effect of machining practical achievement on work readiness

Based on the results of statistical analysis, the value of the correlation coefficient (R) is 0.751 and the value of t-statistics is 17.334 which is greater than 1.651. Correlation coefficient and t-test value indicate that machining practical achievement has a positive value and significantly correlate to work readiness. The value of the coefficient of determination (r2) is 0.565, it shows that the influence of machining practical achievement on work readiness is 56.5%. The better the performance of student's machining practical achievement, the better students' work readiness. On the other hand, the worse students' machining practical achievement, the worse students' work readiness. The results of this study are in line with Wardani (2017) who states skill competence plays a significant role in developing student work readiness since after graduation students will face problems regarding knowledge and skills.

The results show that students' machining practical achievement improves student readiness to work. The better the student's skill, the better their readiness to work. The result of this study is also supported by Yuliani (2018) that student's machining practical achievement has a positive effect on student work readiness. Student's machining practical achievement is expected to provide students with certain skills they need. The competition in the workforce obliges students to have a set of competencies to involve in it.

2. The effect of industrial work practice on work readiness

Based on the results of statistical analysis, the value of the correlation coefficient (r) is 0.573 and the t-statistics value is 16.325 which is higher than 1.651. The correlation coefficient and t-test values indicate industrial work practice has a positive and significant correlation to work readiness. While the value of the coefficient of determination (r2) is 0.525, it shows that the effect of industrial work practice on work readiness is 52.5%. The better the students' industrial work practice, the better the students' work readiness. On the other hand, the worse the industrial work practice experience, the worse students' work readiness. This finding is supported by Putriatama (2016) which implies that the implementation of the internship will indirectly provide knowledge and working experience. This experience will accelerate students in the transition from school to work.

The results show that industrial work practice has a positive impact on students' work readiness. Better experience during industrial work practice has a positive effect on students' readiness to work.

This is supported by Lestari (2018) where she argues that industrial work practice influences students to be well-prepared to start working experience. Industrial work practice is expected to provide students with working experience. Experience is very important in preparing students to work. The experience is needed so that students are better prepared to work after completing their vocational high school.

3. The effect of vocational guidance on work readiness

Based on the results of statistical analysis, the value of the correlation coefficient (R) is 0.573 and the t-statistics value is 10.632 which is higher than 1.651. The correlation coefficient and t-test value indicate that vocational guidance has a positive value and is significantly correlated to work readiness. The coefficient of determination (r2) is 0.328, it indicates that the influence of vocational guidance on work readiness is 32.8%. The better vocational guidance students get, the better students' work readiness will be. On the other hand, the worse the vocational guidance, the worse student readiness to work. The result of this study is in line with the theory that the implementation of vocational education is focused on programs that lead to the readiness of individual work to prepare themselves as workers, one of the programs is vocational guidance(Sukardi, 2012).

The results of this study show that vocational guidance affects students' readiness to work. The better vocational guidance, the more positive it will affect students' work readiness. It is supported by Egbo (2017) that vocational guidance influences the career selection of vocational students, practically it can reduce the unemployment rate of SMK graduates. Vocational guidance is expected to explore students' talents and interests in selecting future careers. Besides, it can also provide an overview of the world of work and the vocational competencies that must be possessed by students.

CONCLUSION

Based on the results of data processing and discussion presented in the previous section, several conclusions are addressed. First students' machining practical achievement is positively and significantly correlate to the students' readiness to work with a correlation coefficient of 0.751, the t-test value of 17,346 which is higher than 1,651 and machining practical achievement contributes 56.5% to work readiness. It also shows the better students' machining practical achievement, the better the students' work readiness. Second, industrial work practice has a positive and significant effect on students' work readiness with a correlation coefficient of 0.726, a value of t-test is 16.325 which is higher than 1.651 and industrial work practice has an effect of 52.5% on students' work readiness. This implies the better students' industrial work practice, the better students' understanding of work readiness. Finally, vocational guidance has a positive and significant correlation to students' work readiness with a correlation coefficient of 0.573, a t-test value of 10.652 which is higher than 1.651 and vocational guidance contributes 32.8% to student work readiness. It shows that the better vocational guidance provided, the better student work readiness.

So, as a final remark, good machining practical achievement and industrial practice experience, supported with regular vocational guidance will positively affect student work readiness. For this reason, every school needs to optimize the aspects of machining practical achievement, industrial work practice and vocational guidance.

REFERENCES

Caballero, C., & Walker, A. (2010) Work readiness in graduate recruitment and selection: A review of Current assessment methods. Journal of Teaching and Learning For Graduate Employability, Vol 1(1), 13 – 25

Jackson, D. (2015). Employability skill development in work-integrated learning: Barriers and best practice. Studies in Higher Education, 40(2), 350–367.
https://doi.org/10.1080/03075079.2013.842221

Hawkins, K.B., Lany Florian, & Martyn Rouse. (2007). Achievement and inclusion in schools. New York: Routledge

Mardini, J. (2013). Creating and evaluating an online and work-based instructional model. Higher Education, Skills and Work-Based Learning, 3(1), 30–50.
https://doi.org/10.1108/20423891311294975

Setiawati, L. (2015). Faktor-Faktor yang Mempengaruhi Prestasi Belajar Praktik Kejuruan Siswa SMK Program Studi Keahlian Teknik Komputer dan Informatika. Jurnal Pendidikan Vokasi vol. 5 (325-339)

Anindo, J., Mugambi, M. M., & Matula, P. D. (2016). Training Equipment and Acquisition of Employable Skills by Trainees in Public Technical and Vocational Education and Training Institutions in Nairobi County, Kenya. International Journal of Advanced Research, Vol 3(4), 103–110.

Yustina, Aprilia (2014) Pengaruh Bimbingan Kejuruan, Motivasi Berprestasi, dan Kemandirian Siswa Terhadap Kesiapan Kerja Siswa Kelas XII TKJ. Jurnal Pendidikan Vokasi. Vol 4 No.2 (181-194)

Richard, S. (2013). Work-Based Learning: Why? How? In UNESCO-UNEVOC International Center for TVET. Revisiting global trends in TVET: Reflection on theory and practice (pp 164-203). Bonn Germany: UNESCO-UNEVOC.

Setyawai, R. (2016)Pengaruh praktik kerja industri, pelaksnaan bimbingan kejuruan dan dukungan keluarga terhadap kesiapan kerja Siswa SMK Swasta di Kabupaten Bantul. Jurnal Sosisal Humaniora dan Pendidikan, Vol 2(1), Pp 35-45.

Heathfield, Susan M. (2016). What is Human Resource Management? [online]. http://human resources.about.com/od/glossaryh/f/hr_management.htm [2 Mei 2019].

Wardani, E.S., Isnandar & Sendari, S. (2017). The Influence of Employability Skills and Skill Competency toward Work Readiness. ICOVET, Vol 116, Pp 3.

Yulianti, L & Yuiarsih, T. (2018). Influence of Industrial Work Practices and Learning Achievements on Students Work Readiness. Journal of Busoniness & Economics Research, Vol 65, Pp 190.

Putriatama, E., Patmanthara, S. & Sugandi, R.M. (2016). Work Readiness Vocational School Graduates Viewed from Industrial Work Practice's Experience and Vocational Skills. International Mechanical Engineering and Engineering Education Conferences (IMEEC 2016), Pp 1-9.

Lestari, S & Mahbubah, H. (2018) Impact of Industrial Work Practices on Student Readiness. International Conference on Economics, Business, Entrepreneurship and Finance (ICEBEF), Vol. 65, Pp 580-583.

Egbo, A.C (2017) Impact of Vocational Guidance on Career Choice of Secondary School Students in Enugu Southlocal Govrnment Area of Ungu State, Nigeria. International Journal of Contemporary Sciences, Vol. 4 (5), Pp 66-79

Sukardi, Thomas. (2011). Peranan Bimbingan Kejuruan terhadap Pembentukan Karakter Kerja Siswa di Jurusan Mesin SMKN 2 Wonosari. Jurnal Cakrawala Pendidikan. Mei 2011, Th.XXX hal (107-117)

Nugraha, H, D. & Widarto (2017) Pengaruh Bimbingan Karir dan Praktik Kerja Industri terhadao Kesiapan Kerja Siswa Teknik Pemesinan SMK Negeri 2 Pengasih. Jurnal Pendidikan Vokasional Teknik Mesin UNY, Vol 5(1), Pp 65-74.