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FACTORS AFFECTING THE EMPLOYABILITY SKILLS OF VOCATIONAL STUDENTS MAJORING MECHANICAL ENGINEERING

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Abstract

This study aims to find out the significance of the direct effect of industrial work practices on work learning readiness, vocational competency, and employability skills, the direct effect of work learning readiness on employability skills, and the direct effect of vocational competency on employability skills. The significance of the effect founds was expected to enhance the knowledge and consideration for developing employability skills vocational high school (VHS) students especially at industrial work practice, work readiness, vocational competency at vocational high school. The research used a quantitative approach with ex-post facto type. The data were analyzed quantitatively to test the formulated hypothesis. The research was conducted at State and Private Vocational High School in Yogyakarta Special Region. The population of the study was grade XII students majoring mechanical engineering. The research samples were 444 students who were selected using proportionate stratified random sampling. The data collection techniques were questionnaires distribution and documentation. The content validity was established using expert judgment. The construct validity was established using analysis factor by Kaiser Meyer Olkin Measure of Sampling Adequacy (KMO MSA) with a value of 0.691. The reliability of the research was judged using Cronbach's alpha with value for work readiness of 0.921 and employability skills of 0.864. The data analysis technique used path analysis. The result of the study shows that employability skills can be improved through effective implementation of industrial work practice, good training work learning readiness, and vocational competency-based technical skills and non-technical skills.

Keywords: *industrial work practices, vocational competence, work learning readiness, employability skills*

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INTRODUCTION

In the 21st century today, there have been many changes in technological progress and the increasing number of job seekers who are mostly young people. These changes lead to increasingly fierce competition in terms of preparing labor or human resources. Vocational High School (VHS) is one of the educational channels in Indonesia to prepare students to get jobs through mastering skills relevant to the world of work.

Many factors cause vocational school graduates still do not get a job after graduating. The focused factor is in terms of soft skills owned by vocational students, which is also known as employability skills. Factors that influence the employability skills of vocational students include communication, information management, counting, problem-solving ability, positive thinking, responsibility, ability to adapt, continuous learning, and working safely. Based on those aspects, vocational school is organized through industrial work practices carried out for several months, the implementation of the Vocational Competency Test at the end of the semester in accordance with their field of expertise, and work readiness of students when they graduate from vocational education. These three things are influential factors for vocational students in getting the opportunity to work in the industry later.

Industrial work practices in vocational schools have a strategic role in preparing high-quality mid-level skilled workforce following the community/industry needs. Although many research results show the success of an internship, seen from the aspects of the process and results, there are still many gaps. According to Directorate of Technical and Vocational Education (2008), the gap between the graduates quality and industrial needs is still high. Industrial participation in the implementation of vocational education is still weak. Students who are in industrial practice in various fields do not receive adequate guidance from the industry. The dual system education model (dual system) is a system that is effective enough to educate and prepare someone to deepen and master complex skills that are impossible or never done in school (Pardjono, 2011).

The existence of differences in the level of readiness and level of progress of VHS (*Sekolah Menengah Kejuruan* or SMK) is also one of the causes of the not optimal level of work readiness of vocational graduates, in the sense that the level of graduate work readiness is uneven. The high and low level of work readiness possessed by students is determined by themselves (Krisnamurti, 2017, p. 67). Other factors that exist outside the student's self are only supporting factors. Although they are only supporting factors, however, they must also be considered. Students, as prospective workers who are declared ready to work, usually have experienced/gone through various processes, both theoretically and practically. Many factors or variables can affect work readiness, both from within students and from outside students.

Student competency testing is carried out following the competence of his expertise and carried out before the national examination. Directorate of Technical and Vocational Education (2018, p. 2) states that the purpose of conducting competency tests is to be an indicator of achievement of graduate competency standards, while for stakeholders, competency tests are used as information on the competencies of prospective workers. Students are said to have passed the competency test if they have implemented the competency test of expertise, including practical competency tests and theory competency tests. The overall verification of the implementation of the competency test is intended so that the implementation of the competency test runs well, and the results of competency tests can be fully recognized by the industrial world.

In addition to the hard-skill competencies described above, vocational students are also required to have skills that make them ready to be employed. The skills learned by students during their education at vocational school are grouped into two, namely technical skills and non-technical skills. Technical skills commonly referred to as hard skill are skills in completing certain occupations. Non-technical skills, or commonly called soft skills in the vocational realm, are known as employability skills. Employability skills are several skills that can be used in daily life in the workplace and can be transferred to various fields of work and professions, which include elements of teamwork, communication skills, problem-solving skills, adaptability, ability to manage oneself (The Conference Board of Canada, 2000).

The assessment indicators on technical aspects and employability skills are indicators received by the industry. Indicators on the technical skills aspect can be identified through the knowledge and skills of the work field. Employability skills aspects can be identified through indicators of managerial ability and personality/personality. Thus, all the indicators on technical and employability skills already represent the competence level of qualification in the Indonesian Qualification Framework (IQF) (Febriana, Premono, & Iriani, 2017).

The industry is expected to provide the right guidance to students who take part in industrial work practice by giving the list of tasks in the implementation of industrial work practice. The school should improve the students' work readiness by providing training before conducting industrial work practice (Putri & Sutarto, 2018).

The results of students' industrial work practice are good; it can improve students' work learning readiness because industrial work practices have a direct effect on the students' work learning readiness. It means that improving the students' work readiness can be achieved by improving the quality of vocational students. The results of good industrial work practices of students can also improve students' vocational competence because industrial work practices have a direct effect on students' vocational competencies. It means that improving the vocational competence of students in the field of mechanical engineering can be achieved through the improvement of the quality of the good vocational student. The results of good student industrial work practices are also able to improve students' employability skills because industrial work practices have a direct effect on students' employability skills. It means that improving students' employability skills in the field of mechanical engineering can be achieved by improving the quality of vocational students.

Students' good work learning readiness can improve their employability skills because students' work learning readiness directly influences their employability skills. It means that improving students' employability skills in the field of mechanical engineering can be achieved by increasing students' work readiness to the maximum level.

Good vocational competence can improve students' employability skills because students' vocational competencies directly influence students' employability skills. It means that improving students' employability skills in the field of mechanical engineering can be achieved by improving the quality of vocational competencies (Jackson, 2013).

Vocational education is education for vocation or education for occupations. Vocational education for the world of work in question is that through vocational education, someone is trained to have the capacity and capability to be able to carry out a task or position. Capacity is obtained through productive training to produce special skills according to the needs of business and industral world. Capability means that someone is able to work hard (Sudira, 2016).

The implications obtained from industrial work practices or apprenticeship which indirectly affect employability skills through work learning readiness is that apprenticeship can improve employability skills if it is supported by increasing students' work learning readiness to the fullest. It means that improving students' employability skills can be achieved by implementing a good internship and supported by increasing students' work learning readiness to the fullest. Industrial work practice impacts indirectly on employability skills through students' vocational competencies. In this case, apprenticeship is able to improve employability skills if it is supported by the implementation of quality vocational competency tests. It means that the implementation of good internship supported by the implementation of a good vocational competency test will improve students' employability skills.

Based on those statements, these three factors are considered to be able to influence the achievement of students' work abilities - or also known as employability skills in the vocational domain - later. For this reason, it is important to look for and see the factors that influence students' employability skills, starting from industrial work practice factors, work readiness factors, and skill competency factors.

RESEARCH METHOD

This research is ex-post facto research with This study employs a quantitative approach, with an ex-post facto type. The nature of this analytical research is to prove an existing theory. The research was conducted in

the State Vocational Schools and Private Vocational Schools in Special Region of Yogyakarta in the major of Mechanical Engineering. The population of this study was 1060 students. The sampling technique was done using the Multi-Stage sampling technique. Cluster random sampling technique was used to attain the number of clusters from each vocational school. The minimum sample of this study was 444 students. The data were collected using the techniques of documentation and questionnaires. Industrial work practice variables and vocational competencies were taken from the final value of the school's industrial work practices and the final value of the school's skills competency test for the variable of work readiness study and employability skills measured using a questionnaire. The validity test used in this study is the factor analysis technique using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA). The data analysis technique used in this study is covariance-based Structural Equation Modeling (SEM).

RESULTS AND DISCUSSION

The results of this study produce a description of the data using the Structural Equation Modeling model and obtain a path analysis based on the previous theory, and path diagram obtained as presented in Figure 1.

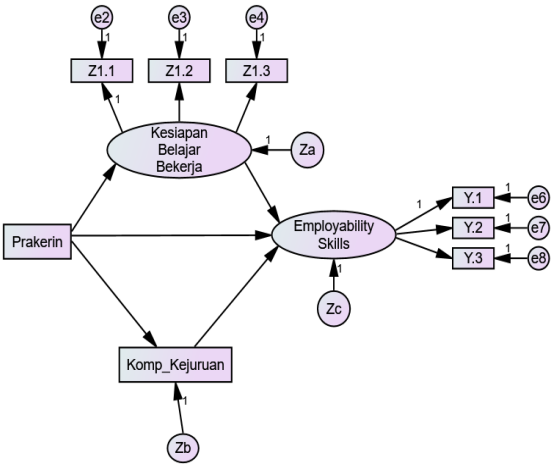

Figure 1. Path Diagram

SEM analysis can only be done if the model identification results show that the model belongs to the over-identified category. This identification is done by looking at the df value of the model made (Ghozali, 2017).

Table 1. Result of Degrees of Freedom

Number	df (degrees of freedom)
Number of distinc sample moment	36
Number of distinc parameter to be astimated	19
Degrees of freedom	36-19 = 17

Table 1 is the output that shows the model df value of 17. It identifies that the model belongs to the over-identified category because it has a positive df value. Therefore, data analysis can proceed to the next stage.

The next testing phase is the model feasibility test consisting of two stages of testing, namely testing the measurement model and the structural model. To test the measurement model, testing the Goodness of Fit (GoF) was conducted to find out how fit the model was with the research data obtained. Figure 2 is the path diagram generated after performing the stages of fulfilling the SEM assumption test.

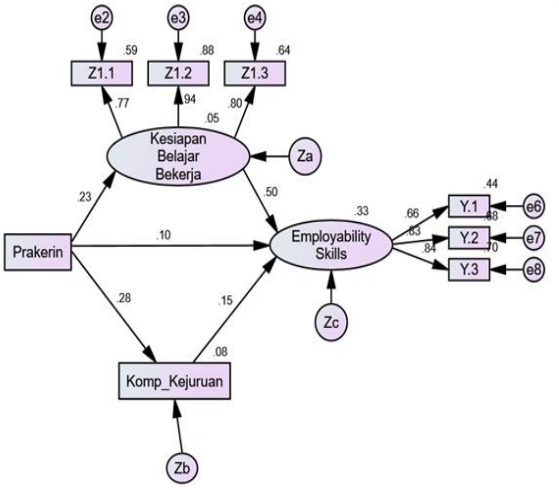

Figure 2. Output Diagram

Based on the output path diagram, a summary of the GoF test results is made as presented in Table 2.

Table 2. Result Goodness of Fit Model

Goodness of Fit	Cut Value	Model Score	Notes
Chi-square	Small	103.637	
DF	>2.0	6.096	Good Fit
p (probability)	>0.05	0.000	Good Fit
RMSE	>0.08	0.107	Good Fit
GFI	>0.09	0.947	Good Fit
TLI	>0.09	0.904	Good Fit

The GoF test results are summarized in Table 3 with information on work learning readiness (KBK), Industrial Work Practice (P), Expertise Competence (UKK), and also employability skills (ES), work learning readiness indicator consists of Z1 (mental and attitude), Z2 (a skill), and Z3 (an insight into the world of work). The employability skills indicators consist of Y1 (fundamental skills at the operator level), Y2 (expert level management personnel), and Y3 (teamwork skills at the supervisor level). The modified model is fit with existing data so that hypothesis testing can be done. Hypothesis testing was done by looking at the value of C.R. (critical ratio) in Table 3.

Hypothesis testing was conducted by comparing the value of C.R. in Table 3. The critical value is identical to the calculated t value, which is 1.65 at the 5% significance level. If the value of C.R. is greater than the critical value with a significance level of $p < 0.05$, then it means that the proposed hypothesis is accepted. However, if the value of C.R. has not been able to reach its critical value at a significance level of $p > 0.05$, then it can be inferred that the proposed hypothesis is rejected.

The following is a discussion of each factor analysis test or hypothesis test based on the test results summarized in Table 3:

In Table 3, the value of C.R. amounting to 4.690 means that this value exceeds the critical value, which is 1.65. These results indicate that the factors of industrial work practice have a significant influence on work learning readiness with a coefficient of 0.156. C.R value. Therefore, the hypothesis is accepted. The fieldwork practice has a significant impact on the readiness of vocational school students majoring mechanical engineering in Yogyakarta Special Region; it is contrary to the research conducted by Firdaus (2012) entitled Production unit, engineering and family support in vocational students' work readiness, showing that work training experience has a significant effect on students' work readiness by 50.1%. It proves that, currently, students have a good and right experience in industrial work, so these students will have good work readiness, supported by the experience possessed by these students, in this case, the students of the mechanical engineering program.

Then, the value of C.R. amounting to 6.196 means that this value exceeds the critical value, which is 1.65. These results indicate that industrial work practice factors have a significant effect on vocational competencies with a coefficient of 0.218. It is in line with a research conducted by Putriatama, Patmanthara, and Sugandi (2016) entitled Contribution of industrial worker experience, world work insights, and vocational competence competence of computer engineering and jaringa expertise. The results of the study show that there is a positive and significant influence between an internship, insight into the world of work, and competency on work readiness. It is in line with Huda, Thoharuddin, and Sore (2019) in his research entitled The effects of industrial work practices, vocational competencies, and parents' socio-economic conditions on work interest and work readiness of computer and networking expertise in Sintang City, showing that industrial work practices have a significant effect on work readiness with an effect of 0.009.

Table 3. Regression Weights

Path Analyzed	Estimation	S.E	C.R	P
KBK - P	0.156	.003	4.690	.000
UKK – P	0.218	.035	6.196	.000
ES – KBK	0.309	.039	7.953	.000
ES – UKK	0.083	0.28	2.989	.003
ES – P	0.042	.020	2.125	.034
Z1.1 – KBK	1.000			
Z1.2 – KBK	0.993	.052	19.194	.000
Z1.3 – KBK	0.326	.019	17.505	.000
Y.1 – ES	1.000			
Y.2 – ES	1.296	.090	14.359	.000
Y.3 - ES	0.892	.064	13.985	.000

Then, the value of C.R. amounting to 2.125 means that this value exceeds the critical value, which is 1.65. These results indicate that the internship factor has a significant effect on employability skills with a coefficient of 0.042. It is in line with research conducted by Susanti, Waras, and Dardiri (2015) who state that vocational students say that the suitability of industrial work practices contributes to student employability skills 28.35. Students who have implemented the apprenticeship well, namely in terms of time or length of internship, appropriateness of internship, and discipline in the implementation of daily apprenticeship will affect their ability to work or student employability skills because these students are trained in obtaining skills relevant to the business world and the world of work that students do not get while at school.

Next, the value of C.R. amounting to 7.953 means that this value exceeds the critical value, which is 1.65. These results indicate that the work learning readiness factor has a significant influence on employability skills with a coefficient of 0.309 C.R value. Thus, it can be said that good work readiness in a student has a big influence on his employability skills because the indicators of work learning readiness and employability skills are quite similar. In work readiness, the indicators include mental and attitudes, skills, and knowledge. In employability skill, if seen in more detail, the indicators also include components in analyzing, communicating, negotiating, and planning skills. All sub-indicators or subcomponents are included in the vocational students' employability skills category in developing their job skills.

The next is 2.989. This value exceeds the critical value of 1.65. It shows that vocational competency factors have a significant influence on employability skills with a coefficient value of 0.083. Thus, it can be said that with the implementation of competency skills tests that are competent, especially in the field of mechanical engineering expertise in vocational high schools, it has a large influence on employability skills for students because vocational competence in vocational schools aims to produce graduates who have proven and competent skills in accordance with their fields of expertise. Vocational competency test is carried out at the end of class XII before students graduate with written exam questions and practices made by teachers and experts in their fields, in this case, in the mechanical engineering field. Employability skills will be formed by testing students through competencies that students must achieve in procedural and effective ways of working so that if students have passed the skills competency test, the vocational student's employability skills will increase, especially in the aspect of problem-solving. It is in line with the research conducted by Putriatama et al. (2016) that there is a significant influence between internship experience, work insight, and vocational competencies for work readiness through employability skills.

Furthermore, the value of t calculated for industrial work practice factors affects employability skills through vocational competence of 2.649. Industrial work practice has a significant effect if the value of t count> t table (1.965). The internship factor has a significant influence on employability skills through vocational competence with a coefficient value of 0.043. Employability skills will increase if the implementation of industrial work practice carried out by students at the time of class XI is carried out well and automatically increases work learning readiness due to the experience possessed by students after completion of industrial work practices. Therefore, employability skills become good when the application of industrial work practice by students is well followed by good work learning readiness. It is in line with the research conducted by Putriatama et al. (2016) stating that there is a significant effect of internship experience, vocational competence on readiness employment through employability skills of 54%, and the remaining 46% is influenced by other factors outside the model.

Finally, industrial work practice factors affect employability skills through vocational competence in the amount of 4.036. Industrial work practice has a significant effect if the value of t count> t table (1.965). The industrial work practice factor has a significant influence on employability skills through vocational competencies with a coefficient of 0.117. A vocational competency is a number of competencies tested at the end of the study period found in a group of subjects in vocational high schools. It means that by completing the industrial work practices in class XI and skills competency tests in class XII, students' work-

ing ability or employability skills will increase. Two variables or two factors, apprenticeship and vocational competence, are the basic requirements that students must fulfill to graduate and achieve overall school activities aimed at improving job skills or employability skills.

So far, there have not been found the results of research on the indirect effect of industrial work practices on employability skills through readiness to work. However, the influence of work readiness on employability skills can be traced from several studies related to the achievement of technical and non-technical skills. The application of technical and non-technical skills in the learning environment of vocational schools generally provides an outstanding influence on character development. It also influences the development of students' employability skills.

There are limitations to the research, namely the measurement of industrial work practices uses the value of apprenticeship from the school or secondary data, causing the score given by the school to have a minimum score of B or good. This condition does not show the real condition because the students' abilities, if measured, are various, from low to very high.

The existence of several schools in the implementation of skills competency tests carried out in different periods, and different test packages cause the measurement parameters used are not the same because the provincial education office adjusts the completeness of the equipment facilities owned by the vocational high schools. Therefore, in this case, it cannot control the quality of the same test for the entire population.

CONCLUSION

Based on the results of the research previously discussed, some conclusions are drawn as follows. (1) There is a direct influence on the apprenticeship to the preparation of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio value of 4.690 and a coefficient of 0.233. (2) There is a direct influence of apprenticeship on vocational competence of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio of 6.196 and a coefficient of 0.282. (3) There is a direct influence of apprenticeship on the employability skills of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio of 2.125 and a coefficient of 0.101. (4) There is a direct effect of work readiness on the employability skills of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio of 7.953 and a coefficient of 0.501. (5) There is a direct effect of vocational competence on the employability skills of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio of 2.989 and a coefficient of 0.154. (6) There is an indirect influence of apprenticeship on employability skills through work readiness of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio of 2.649 and a coefficient of 0.117. (7) There is an indirect influence of apprenticeship on employability skills through the vocational competence of vocational students majoring mechanical engineering in Yogyakarta Special Region with a Critical Ratio of 4.036 and a coefficient of 0.043.

Thus, it can be concluded that the work readiness factor has the highest coefficient value compared to other factors. The coefficient value that is owned is 7.953. Job readiness factor is the strongest predictor that affects employability skills.

Based on the conclusions made, suggestions are proposed as follows: (1) Students' employability skills can be improved by training students in guidance on Industrial Work Practices through communication technology such as e-mail, WhatsApp, Google Drive, etc. in a systematic and structured manner. It will shape their communication skills. (2) Information management owned by students can be trained by familiarizing class discussions about the insights of the business and industry through the direction of the vocational school teacher managing special job fair or through the vocational development center owned by the school so that the information students get is always updated. (3) Employability skills can be improved by familiarizing students with calculating using the mechanical engineering parameter formula both during teaching and learning activities in the classroom and during the final practice exam or expertise competency test. (4) The teacher does not help students who are examining even though students

are in a state of full pressure/underpressure, with the aim that mentally trained students are able to solve the problem well. (5) Employability skills will be formed by encouraging students to conduct SOP workshops with high commitment and discipline, such as giving penalties if students do not use safety shoes when they are in the workshop. (6) Vocational high schools can improve students' work-readiness with periodic and controlled career guidance, which can be achieved through homerooms, vocational development centers owned by schools, or invite industry parties to schools regularly and periodically. Finally, there is a need for further research to uncover other factors that have a significant influence on students' vocational skills, particularly on their employability skills, such as the learning environment, workplace insights, students' interests and talents, students' learning outcomes, and family economy.

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