CORRELATION OF ENGINEERING SKILLS AND ENTREPRENEURSHIP LITERACY TOWARDS ENTREPRENEURSHIP OPPORTUNITIES VOCATIONAL HIGH SCHOOL STUDENTS

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Abstract

This research aims to know the relationship between the engineering skills simultaneously (X₁) and entrepreneurship literacy (X₂) towards entrepreneurship opportunities (Y). This research is descriptive correlation research which is ex post facto. The subject in this study are students of class XII electrical engineering program, electric power installation skills competency Vocational High School in Malang amounted to 79 students. Data collection engineering skills variables using the documentation value of practical training, while entrepreneurship literacy variables and perceptions towards entrepreneurship opportunities to use the questionnaire. Data analysis includes descriptive analysis and regression. The results of the research that has been done, the significance F of 0.000 < 0.05 (p. sig = 5.00%). So, it can be concluded that there is a positive and significant relationship simultaneously between entrepreneurship, environmental literacy and proficiency with the perception towards entrepreneurship opportunities.

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Keywords: engineering skills, entrepreneurship literacy, entrepreneurship opportunities.

INTRODUCTION

The number of job seekers in Indonesia is greater than the number of jobs that are available, thus causing a lot of people who didn't get an opportunities to work. On the other hand, many companies reduce the number of workers. So the jobs available is becoming increasingly limited. The condition
that causes the number of unemployment in Indonesia has increased along with the increased population.

The population in Indonesia is very high that is as much as 261,890,090 inhabitants (BPS, 2017). The high population in Indonesia currently making competition in the work becomes very tight. The tight competition of work in Indonesia to make unemployment figures are high, i.e. 7.04 million people (BPS, 2017). BPS recorded a number of Vocational high school graduates who are unemployed reached 11.41 percent of the total 7.04 million unemployed per August 2017.

In fact, such data is inversely proportional toUU RI no. 20/2013 on Indonesia’s education system. The ACT mentions that Vocational secondary school (SMK) is a secondary school preparing students by developing the expertise and skills to work on specific areas in accordance with the vocational program. Thus are expected graduates of vocational high school (SMK), can directly work appropriate skills and entrepreneurship as well as the skills they have.

(Anggles, 2017), stating that Indonesia is still experiencing failure in build entrepreneurship. Entrepreneurship Indonesia still number less than Malaysia 5%, Chinese 10%, Singapore 7%, Japan 11% or 12% of the U.S., while Indonesia reached 3.1% entrepreneurial principals of a total population of Indonesia (Kemenkop dan UKM, 2017). To that end, the need for entrepreneurial building efforts so as to open up new job openings that can help the country's development and growing interest of society to entrepreneurship. Lack of interest in entrepreneurship serious attention from the Government. One of the real evidence the Government incorporate the entrepreneurial learning in Vocational secondary school (SMK) throughout Indonesia. The narrowness of the field work of making Vocational secondary school (SMK) possess other purposes i.e. prepare students to open their own business or entrepreneurship.

The Ministry of Education has a policy to reverse the ratio of Vocational High School student compared to 30:70, out of Senior High School in 2004 became a 67:33 in 2014. This policy is intended to let the output of education can be more oriented to the fulfillment of work and labor needs in Indonesia (Putro, Elmunsyah, Putranto, & Nidhom, 2017), (Wulandari, Putro, & Rahmawati, 2016). It is hoped through the development of Vocational High School, the unemployment rate can be suppressed. Vocational High School is based on education in the curriculum that equips graduates with specific skills to fill employment or open field efforts.

Vocational high school students of class XII which will follow the national final examination, next will determine the options after graduation, whether students will work, entrepreneurship, continuing to college or forced to idle because there is no cost schools and the lack of jobs. In addition, the absence of entrepreneurship opportunities due to lacking understanding of the entrepreneurial world. The experience and background of the students will influence in determining the selection of the students after graduation. When students have experience and background that support them to make choices after graduating school, are choosing to work, entrepreneurship or continuing to College, then there would be a problem for students able to be responsible with what is selected after graduation.

Entrepreneurship is rarely thought of students after graduation. Students interpret this entrepreneurship through the process of
perception and the result of the process of perception will influence the process of follow-up activity. Perception towards entrepreneurship opportunities associated with knowledge-related entrepreneurship students. Students can perceive entrepreneurship of related knowledge. This is in accordance with Saleh (Shaleh, 2008) that the perception of a person depends on what to expect and depend on past experience as well as the existence of motivation.

Perception is a process resulting from an object that has been captured by the five senses of humans that would produce a response or assessment of the object (Shaleh, 2008). According to (Suparyanto, 2012), entrepreneurial risk taking courage is certain to profit. Entrepreneurship is the experiences faced by all students of vocational high school through entrepreneurial subjects. Students interpret this experience through the process of perception and perceptual outcomes affect mental activity. One of the mental activity that are affected, namely the decision of the student in determining upon graduation.

Perception towards entrepreneurship opportunities is a process resulting from the absorption of an object (entrepreneurial) involving the five senses and the brain which further raises the related view of entrepreneurship opportunities. From these descriptions, indicators for variable perception towards entrepreneurship opportunities, namely: (1) absorption toward entrepreneurship opportunities, how the students have attention to entrepreneurial and liveliness of the students in self-employment information; (2) psychological aspects, namely the needs of students with entrepreneurial, interest/pleasure students in entrepreneurship, and past experiences of students that raises students tend to want to entrepreneurship entrepreneurship or not; and (3) responses and awareness, that is how students rate of entrepreneurship after earlier seeing facts about entrepreneurship and awareness of students to information obtained related entrepreneurial (Shaleh, 2008).

Vocational education aims to improve intelligence, knowledge, personality, attitudes, and noble, as well as the skills of the students to live independently and follow further education in accordance with the vocational program. In order to operate effectively and efficiently and develop their expertise and skills, they must have high stamina, mastering the field of his expertise, the basics of science and technology, have a high work ethic, and able to communicate compliance with the demands of his work, as well as have the ability to develop themselves (Permendiknas No. 22/2006).

According to (Atmosudirdjo, 1998) stated that the ability of the technique is one of the skills that need to be owned by any individual in an organization with the goal to achieve a desired criteria within an organization. Meanwhile, according to (Handoko, 2001) capabilities of the technique is one of human capability in the form of specific skills used to perform a particular job. (Gibson, Ivancevich, & James, 1996) stated that technical skill is the ability to use the tools, procedures and techniques of a specialized field.

Vocational secondary school subjects were divided into three groups, namely the Group of national, region, and productive (Directorate General of primary and secondary education, 2017). The productive group serves to equip students to have competency standard or productive ability at a specific job/expertise relevant to the demands of the job market and demand. Competence Subjects of electric power installation engineering, among others; The in-
stallation of the Electric Motor, the installation of electric lighting and electric power Installations.

Reference to such theories, it can be concluded that the engineering skills is a specific skill that should be owned by every student with the purpose to perform a particular job in a way that is already in the set. So, the engineering skills is an experience to get the specific skills of the job. Engineering skills are the basis of the student’s thinking or can be practiced in reality. In other words, is an engineering skills a person both in individuals and groups to perform an action.

Students engineering skills is obtained when teaching and learning activities in Vocational high schools. In particular, when teaching and learning activities subjects competency skills (C3). Thus to know engineering prowess culled a list of practical value of C3 subjects, namely; (1) the installation of an electric motor; (2) the installation of electrical power; and (3) the installation of electric lighting.

According to (Sari & Indriyana, 2016) literacy ability is a unity of language proficiency, i.e. the ability of reading, writing, speaking, and listening are connected by critical thinking ability so obtained a deeper understanding of the complex against an information. Literacy is the position statements of the reading, writing and thinking to create a context in the socio-cultural. Also about literacy texts and readers, students and teachers, the classroom and the community in the sphere of local, regional and international (Nurtanto et al., 2019).

According to (Suryana, 2013) entrepreneurship is a science disciplines who study about the value, capabilities (ability), and the person’s behavior in the face of life’s challenges and how to obtain opportunities with a wide range of risks facing it. Entrepreneurship is a discipline of its own, has a systematic process, and can be applied in the form of the application of creativity and innovation.

In objects of entrepreneurial studies (Suryana, 2013) may include a person’s ability in any of the following: a) goal attempt formulated capability; b) the ability to motivate oneself; c) ability initiative; d) ability to innovate; e) the ability of forming material, and social capital; f) the ability of the set time and familiarize yourself; g) mental ability is based on religion; and h) the ability of getting used to in taking lessons from the experience of the good and the painful.

(Thobias, 2013) stated there are five principal essence of entrepreneurship, i.e.; a) strong ability to work with the spirit of self-reliance; b) ability to solve problems and make decisions systematically, including courage take risks; c) ability to think and act creatively and innovative; d) ability to work carefully, diligently, and productive; and e) capability worked in togetherness based on business ethics.

Based on the description, the literacy that entrepreneurship is the ability of a person who owns, manages, instituting his own business, doing creative efforts and innovative ideas, develop and manage existing resources as well as harnessing the opportunities of entrepreneurship. From the description in the drop indicators for entrepreneurship literacy variables, namely; (1) the ability to formulate business goals, (2) the ability to innovate, (3) the ability to motivate oneself, (4) social and material capital, and (5) the ability of the set up time and familiarize yourself.

Based on the description, examined about correlation engineering skills and entrepreneurship literacy with the perception of entrepreneurship opportunities towards students of class XII installation engineering program
electrical power Vocational high school in the city of Malang. Before exposing the independent variable relation towards variable, this research was preceded by descriptions engineering skills, literacy of entrepreneurship and entrepreneurship opportunities against perceptions of students of class XII installation engineering program electric power vocational high school in the city of Malang.

METHOD

This research is descriptive research using the method of correlation with Ex Post Facto approach. This research uses descriptive correlation with design goals describe variable engineering skills and entrepreneurship literacy with the perception of entrepreneurship opportunities towards students of class XII electricity installation engineering program vocational high school in Malang.

The population of this research is to grade XII electricity installation engineering program Vocational High School 6 Malang, Vocational High Schools of National Malang, Vocational High Schools of Muhammadiyah 1 Malang. The sample is determined by purposive sampling technique. The amount of this research sample of 79 students.

Entrepreneurship literacy variables and perceptions towards entrepreneurship opportunities is measured using the likert scale questionnaire instrument. The value of alpha cronbach’s test result reliability instrument variable perception of entrepreneurship opportunities against 0.902, while the value of alpha cronbach’s test result reliability instrument entrepreneurship literacy of 0.885. While the engineering skills variable measured using secondary data value practical documentation.

The dual regression was used to analyze the data of this research. The first stage of the test the prerequisite analysis, (1) test of normality, (2) test of linearity, (3) test for multicollinearity, (4) autocorrelation test, and (5) test for heteroscedasticity. Analysis prerequisite test results that have been done are qualified to use the parametric statistics (see results and discussion). The second stage, the preparation of the SPSS Regression analysis application assisted by entering the data that passes a test prerequisite. The last stage, process data in SPSS applications to meet needs of the research objectives. Significant levels used in this study of 0.05 (p. sig = 5.00%).

RESULTS AND DISCUSSION

The result of the test of Kolmogorov-Smirnov that shows the value of Asymp. Sig of 0.200 > 0.05, which means the data is distributed normally. In addition, test results analysis normal P-Plot graph shows that all normal distributed variables, where the data is spread around the diagonal line and follow the direction of the diagonal lines.

Linearity test results has been done of significance value obtained (X₁ and Y; X₂ and Y) below 0.05. So the relation X₁ and Y and X₂ and Y is expressed in linear.

Multicollinearity test results has been done obtained results value Tolerance > 0.1 and VIF < 10. So it can be said the relationships between variables not occurring multicollinearity.

Autocorrelation test result see Durbin Watson Tables for the number of samples (n = 79) and the number of independent variables is
two \((K = 2)\) with a 5\% significance level, then the retrieved value \(d_l = 1.530\) and \(d_u = 1.6867\). DW Test results obtained by DW values \((d) = 1.724 > d_u\) i.e. 1.6867. Next value \((4 - d_u) = 2.3133 > DW\) i.e. 1.724. From the results above, then the analyst can be concluded there is no autocorrelation both positive and negative.

The results of hypothesis testing that has been done to the variable skills techniques with the perception of entrepreneurship opportunities against the known positive and significant value of \(r = 0.368\) \((P_{\text{calculation}} = 0.05 < 0.00)\). The results of calculation of the relative contribution of 44.45\%. Whereas the effective contribution of 27.73\%.

Engineering skills is one of the must-have competencies students of class XII which will determine the next step after graduation. This is in harmony with the goal of competence of engineering electric power installation that is to equip students with the skills, knowledge and attitudes that are competent with expertise and skills in engineering program electrical energy utilization in order it can work either independently or fill the jobs that are in the business world and the industrial world as middle-level manpower. It is therefore with a high engineering skills, entrepreneurship opportunities for them then it will open.

(Pratiwi, Sudjimat, & Elmunsyah, 2017), (Hartiningtyas, Purnomo, & Elmunsyah, 2016), a vocational high school graduates can become a skilled workforce and quality in mastering aspects of hard skills and soft skills. Hard skill aspect i.e. skills that relate to the substance of the scientific competence of engineering electric power installation. It is aligned with descriptors of the indicator the perception towards entrepreneurship opportunities, i.e. the interest, pleasure, and expertise. When students have a high engineering skills, then they will have the opportunity entrepreneurship.

The skills and experience of the learners while doing practical work in schools, will open opportunities for entrepreneurship students after graduation. The productive subjects \((C3)\) the competence of the installation of electric power engineering, among others; installation of electric lighting, electric power installation, and the installation of an electric motor. With the engineering skills, students have the opportunity to open his own business and create jobs for others. Examples of such efforts include; (a) open the electrical installation services, (b) open the electrical appliance shops, and (c) open the garage servicing dynamo.

The results of hypothesis testing that has been done towards entrepreneurship literacy variables with the perception of entrepreneurship opportunities against the known positive and significant value of \(r = 0.319\) \((P_{\text{calculation}} = 0.00 < 0.05)\). The results of calculation of the relative contribution of 55.55\%. While donations effectively amounted to 34.66\%.

Entrepreneurship literacy is the ability of a person who owns, manages, instituting his own business, doing creative efforts and innovative ideas, develop and manage existing resources and make use of the opportunity entrepreneurship. The research of (Sari, 2015) says that with the increasingly high entrepreneurship knowledge can increase interest in entrepreneurship students. If class XII students are able to plan the entrepreneurial, then students are fulfilling one of the main elements of entrepreneurship opportunities.

(Boohene, Sheridan, & Kotey, 2008), entrepreneurship is the ability to be creative
and innovative, and basic resources to looking for opportunities to success. The essence of entrepreneurship is the ability to create something new and different through creative thinking and innovative acts to create opportunities. Entrepreneurship literacy is very high by indicators of business is the ability to innovate. (Putro et al., 2017), mentioned that creativity is the ability of students to come up with new ideas, and helpless. Where the students have the ability when creative and innovative, he will have great ideas and are able to realize those ideas.

As for indicators with the second stage of any interconnected variables between entrepreneurship literacy with variable perceptions towards entrepreneurship opportunities. Indicators of entrepreneurship literacy variables second order i.e. the ability to motivate oneself. Meanwhile, the indicator variable perception of entrepreneurship opportunities against a second-order, namely the psychological aspect. Both of these same indicators – same interpret each individual itself. The ability to motivate yourself is how every individual can foster a spirit of entrepreneurship, so that every student has the desire and the spirit of entrepreneurship. As well as psychological aspects, that will assess students based on what attracts their attention.

Can be indicated from the indicators found on each variable, that variable entrepreneurship literacy related and variable effect on the perception of entrepreneurship opportunities against. That is, if entrepreneurship literacy increases, then the perception towards entrepreneurship opportunities also increased.

Table 1. The results of the regression analysis between Independent Variables with Dependent variables

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Sig. t</th>
<th>X₁</th>
<th>0.000</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>X₂</td>
<td>0.000</td>
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<tr>
<td></td>
<td></td>
<td>R</td>
<td>0.764</td>
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<td></td>
<td></td>
<td>R Square</td>
<td>0.624</td>
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<td></td>
<td></td>
<td>F calculation</td>
<td>29.633</td>
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<tr>
<td></td>
<td></td>
<td>Sig. F</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on table 1 Note that the value of F significance 0.000 < 0.05, so the can be said of the relationship between engineering skills and entrepreneurship literacy variables with the perception of entrepreneurship opportunities against simultaneously is linear and significant.

The relationship between the engineering skills partially with the perception towards entrepreneurship opportunities students of class XII electricity installation engineering course vocational high school in Malang and entrepreneurship literacy with the perception of entrepreneurship opportunities towards students of class XII installation of electric power engineering program vocational high school in Malang has a positive and significant relationship.

Research conducted by (Prasetyo, 2016) obtained the result that achievements subjects entrepreneurship influential of entrepreneurial interests of students Vocational High School class XII. This is in consistent with this research, showed that prowess engineering has a very tight relationship with perception towards entrepreneurship opportunities.

Whereas the relevant research that supports entrepreneurship literacy with variable perceptions towards entrepreneurship opportunities have been examined by (Abbor, 2017) with the conclusion there is a positive and significant relationship between social
media literacy with self-employment entrepreneurship interest students of vocational high school in Blitar. Thus it can be interpreted that entrepreneurship literacy coupled with the perception of entrepreneurship opportunities towards students of class XII electricity installation engineering program in Malang.

The engineering skills and entrepreneurship literacy related and influential with the perception towards entrepreneurship opportunities students of class XII installation engineering program electrical power vocational high school. From the results of this research it is known that both the independent variables simultaneously have a close relationship in influencing perception towards entrepreneurship opportunities. With respect to such matters, engineering skills and entrepreneurship literacy increases then the perception towards entrepreneurship opportunities students of class XII electricity installation engineering program in the city of Malang also experienced an increase.

To enhance the perception of entrepreneurship opportunities, against students should pay attention to technical and entrepreneurship literacy skills. Perception of entrepreneurship opportunities against a good can also be obtained from the environment and background of each student itself. However, the perception towards entrepreneurship opportunities without supported with good engineering skills, it will be difficult for itself when the students have already begun to entrepreneurship. In addition, it has a good engineering skills still lacking without the support of entrepreneurship literacy. Perception towards entrepreneurship opportunities will be optimal if it is supported by engineering skills and entrepreneurship literacy.

**CONCLUSION**


Engineering skills students of class XII installation engineering program electrical power vocational high school in the city of Malang is included in the category of medium. Class XII student entrepreneurship literacy program installation engineering of electric power vocational high school in the city of Malang is included in the high category. Indicators that strongly support i.e. ability to innovate. Perception of entrepreneurship opportunities towards students of class XII installation engineering program electrical power vocational high school in the city of Malang is included in the high category. Indicators that support i.e. responses and awareness.

There is a positive and significant relationship partially between engineering skills with the perception towards entrepreneurship opportunities. There is a positive and significant relationship partially between entrepreneurship literacy with the perception towards entrepreneurship opportunities. While simultaneously there is a strong relationship between literacy and entrepreneurship, engineering skills with the perception towards entrepreneurship opportunities.
The research results show the lowest value engineering skills i.e. 75.44. So, to overcome this problem, the teacher can apply learning models that can improve the understanding of students. Second, the results of the study showed the average value of the indicators found in the lowest ability set the time and familiarize yourself on entrepreneurship literacy variables. So, needed a impulse from the surrounding environment is primarily the elderly. Third, the results of the study showed the average value of the lowest indicators contained in absorption against entrepreneurship opportunities on the variable perception towards entrepreneurship opportunities. Thus, the student is expected to resolve it themselves more smartphone utilizes a positive to find information. Fourth, the existence of advanced research required to uncover the perception towards entrepreneurship opportunities vocational secondary school students by presenting other predictor variables.

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