



The Relationship Between Engineering Knowledge and Self-Confidence Level on Adaptability in The Industrial World of Work 4.0 For Students of TITL Skill Competency SMK In Blitar City

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ABSTRACT

In the era of the industrial revolution 4.0, a person must have the ability in accordance with technological developments, one of which is engineering knowledge and self-confidence to improve the ability to adapt to SMK TITL students in the world of work. Engineering knowledge is knowledge that studies a particular field, where this knowledge is expected that students can solve a problem. Meanwhile, the level of self-confidence is an ability contained within that causes the courage of SMK TITL students to take responsibility for all their actions. This research aims to: (1) Describe Engineering Knowledge (X1), (b) Self-Confidence Level (X2) and (c) Adaptability in the World of Work Industry 4.0 (Y); (2) Know the significance of the relationship between X1 and Y; (3) Know the significance of the relationship between X2 and Y; (4) Know the significance of the relationship between X1 and X2 with Y simultaneously.

The method used is quantitative with a descriptive correlation plan. This study uses Simple random sampling technique with a population of 154 respondents of class XII students of TITL competence in Blitar City who have carried out practical work and taken Basic Vocational Program (C2) subjects. The instrument used by variables X1, X2, and Y is a questionnaire with a Likert scale of 4. The X1, X2, and Y variables have the following reliabilities: 0.914, 0, 938, and 0.920. Data analysis techniques using partial correlation analysis and multiple regression, prerequisite tests using SPSS application assistance.

The research results are known: (1) Engineering Knowledge in the high category; (2) Self-confidence level in the very high category; (3) Adaptability in the World of Industry 4.0 in the high category; (4) Partial correlation coefficient X1 with Y of 0.53 and a significance level of 0.000; (5) Partial correlation coefficient X2 with Y of 0.692 and a significance level of 0.000; (6) Simultaneous correlation coefficient X1 and X2 with Y of 0.758 and a significance level of 0.000. The conclusions in this study are: (1) there is a positive and significant relationship between X1 and Y; (2) there is a positive and significant relationship between X2 and Y; (3) there is a positive and significant relationship between X1 and X2 simultaneously with Y in class XII students of TITL Expertise Competency in Blitar City.

Keywords: *Engineering Knowledge, Confidence Level, Adaptability in the World of Work Industry 4.0.*

1. INTRODUCTION

The development of increasingly sophisticated technology has caused the industrial world to prepare technology-based changes known as industry 4.0. The main characteristic of industry 4.0 is the decreasing role of physical humans in various daily activities and production [1]. Quoted from the Ministry of Education and Culture explains that the industrial era 4.0 75% of human work involves science, technology and math skills, the internet of things (IoT) and unlimited learning [2].

Education in Indonesia adapts to industry 4.0 using a combination of methods from improving human resources in the link and match program between education and industry [3]. According to Boylan [4] adaptation is a change in behavior

characterized by innovative or creative approaches in response to environmental changes. The advancement of technological development must be applied in an industry so that it is not left behind by other industries. Based on the explanation above, it can be concluded that adaptability in industry 4.0 is the ability of vocational students to adjust to a new environment by utilizing soft skills and creative and innovative technology.

Factors that influence the ability to adapt in the work environment in the industrial world 4.0 of SMK TITL students in the Industrial World of Work 4.0 education or education such as learning, training, self-determination and experience gained when carrying out industrial practices [5]. The experience gained by SMK TITL students in industry 4.0 such

as applying K3 (security, safety and safety) in accordance with PUIL rules, applying standing operational procedure (SOP), honing skills in using developing technology such as the internet of things (IoT) in the work environment.

According to Stevani [6], aspects of adaptability in the work environment in the industrial era 4.0, as follows: (a) Self Knowledge and Self-Insight, (b) Self Objectivity and Self-Acceptance, (c) Self Development and Self Control, (d) Satisfaction, and (e) Good Interpersonal Relationship. While the indicators that will be revealed in influencing the adaptability of TITL vocational students in the work environment in the industrial world 4.0, include: (a) The ability to understand potential and self-knowledge in adapting to the work environment, (b) The ability to think critically and solve problems creatively, (c) The ability to control oneself well, (d) Having self-satisfaction gained from work, and (e) The ability to establish good interpersonal relationships with coworkers. Factors that influence adaptability [7], namely: engineering knowledge and level of self-confidence.

One of the knowledge areas that must be possessed by SMK students is engineering knowledge. According to Putro [8] engineering knowledge is the understanding that individuals have in the form of certain knowledge that is useful for doing a certain job with several methods that have been learned. A high understanding of engineering knowledge will have a positive impact on student skills in the work environment. Productive subjects that must be taken by vocational students majoring in ITTL referring to Perdirjen Dikdasmen No. 464 / D.D5 / KR / 2018 consists of several competency standards which include productive subjects in the basic program group (C2) of ITT vocational, namely: (a) electric motor installation (electromechanical control), (b) electric lighting installation, and (c) electric power installation.

The learning process of knowledge, attitudes and skills of SMK TITL students required includes: (a) students can understand the installation of 1-phase lighting in accordance with PUIL, (b) students can apply the procedure for installing lighting PHB installations in simple buildings in accordance with PUIL, (c) students can analyze public street lighting installations, (d) students can evaluate three-phase lighting installations for buildings and so on.

In the industrial world 4.0, one of the important abilities is the level of self-confidence, because this attitude must be possessed by someone to adjust. According to Gufron [9] suggests that self-confidence is the belief to do something on the subject's self as a personal characteristic that there is confidence in one's abilities, optimistic, objective, responsible, rational and realistic. The level of self-confidence of each individual is very different, both high self-confidence and low self-confidence. Low self-confidence to adapt to the industrial world 4.0 will have a negative impact, while high self-confidence in the industrial world 4.0 will have a positive impact. According to Hendriana [10], aspects that affect the level of self-confidence in a person include the following: (1) Self-confidence, (2) Optimistic, (3) Objectivity, (4) Responsible, and (4) Rational and Reality. There are four indicators that can affect the level of self-confidence in the industrial world 4.0, including: (a) Believe in one's own abilities, (b) Act independently in making decisions, (c) Have a positive self-concept, and (d) Dare to express opinions.

The number of SMK graduates in Indonesia is not proportional to employment opportunities, which results in a high unemployment rate. Based on data [11], the number of open unemployment rates in Indonesia reached 8.75 or 6.26% in February 2021. The highest open unemployment rate in August 2021 was for vocational school graduates, which amounted to 11.13% [12]. This shows that SMK graduates are not in accordance with the needs of industry 4.0, which has led to a higher number of unemployed people in Indonesia. This condition shows a match with several SMK students, especially at SMK Blitar, which is emphasized by Gavriila [13], which reveals that due to the constraints of the (Covid-19) situation, students apply an online learning system which affects their level of understanding, such as not understanding the basic knowledge of engineering which has an impact on the lack of confidence in practicing at industrial sites, so that these students cannot adapt to the revolutionary era in industry 4.0 easily.

Based on the description above, engineering knowledge and self-confidence levels support the process of adapting to the world of work for vocational students majoring in electricity after graduation. So, research is needed to examine this case with the title "The Relationship between Engineering Knowledge and Self-Confidence Level

to Adaptability in the World of Work Industry 4.0 in TITL Expertise Vocational Students in Blitar City".

2. RESEARCH METHODS

2.1 Research Design

This type of quantitative research with a descriptive correlational research design that is ex post facto. ex post facto is an observation activity in research on variables carried out after the activity occurs [14]. This study uses two independent variables (X), namely engineering knowledge (X₁) and self-confidence level (X₂) and one dependent variable (Y), namely adaptability in the industrial world 4.0. The research design can be seen in Figure 1 below.

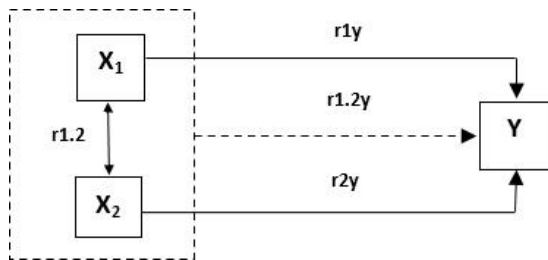


Figure 1 Research design

Description:

- X₁ : engineering knowledge
- X₂ : level of self-confidence
- Y: adaptability in the industrial world 4.0
- r_{1y}: partial relationship between x₁ and Y
- r_{2y}: partial relationship between x₂ and Y
- r_{1.2}: intercorrelation relationship between x₁ and x₂
- r_{1.2y}: simultaneous relationship between x₁ and x₂ to Y

The population in the study were all XII grade vocational students in the Electric Power Installation Engineering specialty at SMKN 1 Blitar and SMK Islam 1 Blitar, totaling 250 students. The category of data collection requirements is class XII students who have carried out industrial practice (PI) and taken Basic Vocational Program (C2) subjects. The population data can be seen in Table 1 as follows.

Table 1. Data on the Number of Students in Each School.

Name of the School	Number of Students	Accreditation
SMK Negeri 1 Blitar	140	A
SMK Islam 1 Blitar	110	A
Total	250 Student	

Source: Data on SMK Schools in Blitar City in 2022

The sampling method uses the Random Sampling method to strengthen data collection strengthened by the Propotional sampling method, so that the number of samples to be studied is 154 students from SMKN 1 Blitar 86 students and SMK Islam 1 Blitar 68 students with consideration of the accompanying teacher. Meanwhile, to measure the level of accuracy and error using the Solvin formula has a 95% confidence level (5% significant level) and a proportion (p) of 0.05. Can be seen in the following slovin formula:

$$= \frac{250}{1 + 250 \cdot 0,05^2}$$

= 154 Student

Description:

- : sample size
- N : population size
- A : error rate of 5% or 0.05

In addition, to strengthen data collection using Propotional sampling. The research sample taken from SMKN 1 Blitar class XII students is:

$$= \frac{140}{250} \cdot 154 = 86$$

The research sample taken from students of SMK Islam 1 Blitar class XII is:

$$= \frac{110}{250} \cdot 154 = 68$$

Description:

- : sample size
- N_i : total student population of each class
- k : population size

2.2 Instrument Testing Technique

This study uses a questionnaire instrument or closed questionnaire to obtain data obtained from respondents regarding engineering knowledge, level of confidence, and adaptability in the industrial world 4.0. The Likert scale measurement scale consists of four score range criteria ranging from

strongly agree, agree, disagree and strongly disagree [15]. The following table 2 Alternative Answers from each scale.

Table 2. Alternative Answer

Description	Score
Strongly Agree	4
Agree	3
Disagree	2
Disagree strongly	1

Source: (Sugiyono, 2018)

The questionnaire was tested on 31 respondents of Class XII students of the TITL Department in Blitar City. The results of the trials conducted, namely:

a) Instrument Trial of Adaptability in the World of Industry 4.0

The results of the questionnaire test of Adaptability in the Industrial World 4.0 from 32 question items were 28 valid question items and 4 invalid question items. All valid items have represented the indicator items to be measured. Can be seen in Table 3 the results of the validity trial of the Adaptability in the Industrial World 4.0 instrument. The reliability test results obtained an alpha value of 0.920 and have an alpha value of each item > 0.514 for each item, meaning that all items are reliable.

b) Engineering Knowledge Instrument Test

The results of the Engineering Knowledge questionnaire test of 30 question items contained 28 valid question items and 2 invalid question items. All valid items have represented the indicator items to be measured. Can be seen in Table 5 the results of the validity test of the Engineering Knowledge instrument. The reliability test results obtained an alpha value of 0.914 and have an alpha value of each item > 0.514 for each item, meaning that all items are reliable.

c) Self-Confidence Level Instrument Test

The results of the test of the Self-Confidence Level questionnaire from 23 question items were 18 valid question items and 5 invalid question items. All valid items have represented the indicator items to be measured. Can be seen in Table 7 the results of the validity test of the Self-Confidence Level instrument. The reliability test results obtained an alpha value of 0.938 and have an alpha value of each item > 0.514 for each item, meaning that all items are reliable.

Analysis Technique

Data analysis is a stage in data management as an initial part, grouping and presenting the data

based on the variables studied and calculated. Data results to determine data descriptions include minimum value, maximum value, mean, median, and standard deviation.

The normality test is a test of the distribution of data that is normally distributed or not in each group of variable data. This normality test uses the One Sample Smirnov test. If $p > 0.05$ then there is no difference in significance or the data tested is said to be normal t (Susanto, 2015: 393). The normality results can be seen in Table 3 as follows.

Table 3. Results of Normality Test

Variable	P _{sig}	Conclusion	Interpretation
1. Engineering Knowledge	0.074	$p > 0.05$	Normal
2. Confidence Level	0.092	$p > 0.05$	Normal
3. Adaptability in the World of Work Industry 4.0	0.063	$P > 0.05$	Normal

The linearity test is a test that has the aim of knowing the relationship between variable X and variable Y. Decision making data in this linearity test, if the output results from SPSS linearity significance value < 0.05 means that there is a significant linear relationship between the precursor variable (x) and the criterion variable (y) [16]. The linearity results can be seen in Table 4 as follows.

Table 4. Results of linearity test

Variable	P _{sig}	Conclusion	Interpretation
X ₁ and Y	0,00	$p < 0.05$	Linear
X ₂ and Y	0,00	$p < 0.05$	Linear

The multicollinearity test has the aim of testing whether the regression model found a correlation between the independent / free variables. Decision making in this study uses VIF (Variance Inflation Factor), namely if the tolerance value < 0.10 or the same as $VIF > 10$ means that there is no multicollinearity relationship [17]. The multicollinearity results can be seen in Table 5 as follows.

Table 5. Multicollinearity Test Result

Variable	Collinearity Statistics	
	Tolerance	VIF
Engineering Knowledge	0.850	1.177
Self-Confidence Level		

The autocorrelation test aims to test whether in a linear regression model there is a correlation between usage error in period t and confounding error in the previous period t-1. The run test has a basic decision-making value, namely the Asymp value. If the Asymp Sig (2-tailed) value > 0.05 means that there will be no autocorrelation. The way to find out for the dL value of 1.7103 and dU is 1.7629 which is obtained in the DW table with 154 respondents. Based on the explanation above, it can be concluded that. If the value of $dU < DW < 4-dU$, then there is no autocorrelation in this study with a value of $1.7629 < 2.063 < 2.2371$. The results obtained with the help of the SPSS application can be seen in Table 6 as follows.

Table 6. Autocorrelation Test Result

Autocorrelation Test of Independent Variables	Durbin-Watson	Interpretation
X ₁ and X ₂	2,063	No Autocorrelation

The heteroscedasticity test aims to determine whether a regression model has an inequality of variance from the residuals of one observation to another. The basis for decision making is if the points on the diagram look regular forming waves, narrowing or widening, then heterodasticity occurs. If the dots are in the form of irregular or non-patterned patterns, it is stated that heterodasticity does not occur [17]. The results of heteroscedasticity can be seen in Figure 2 as follows.

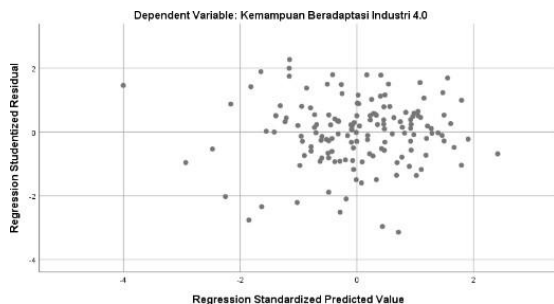


Figure 2 Heteroscedasticity test results.

The results of testing the first, second and third hypotheses can be seen in table 7.

hypotheses

Table 7. Test results of the first, second and third

Partial Relationship	Probability		Interpretation
	P _{Calculate}	P _{default}	
X ₁ – Y	0.000	< 0.05	Relationship (+) significant partially
X ₂ – Y	0.000	< 0.05	Relationship (+) significant partially
X ₁ and X ₂ – Y Simultaneousl y	0.000	< 0.05	Relationship (+) significant simultaneously

H1: there is a partially positive and significant relationship between engineering knowledge and adaptability in the industrial world 4.0 of TITL skill competency vocational students in Blitar city.

H1: there is a partially positive and significant relationship between the level of self-confidence and adaptability in the industrial world 4.0 of students of the TITL Competency Vocational School in Blitar city.

H1: there is a simultaneous positive and significant relationship between engineering knowledge and level of self-confidence with adaptability in the industrial world 4.0 of students of the TITL Skill Competency Vocational School in Blitar city.

3. RESULTS AND DISCUSSION

The data of the research results described in the adaptability in the industrial world of work 4.0 (Y), engineering knowledge (X1), and the level of self-confidence (X2). Details of the data description of the research variables can be seen in Table 8.

Table 8. Descriptive Data on Research Variables

	adaptability in the world of work industry 4.0 (Y)	engineering knowledge (X ₁)	Self confidence level (X ₂)
N	154	154	154
Minimum	50	60	29
Maximum	112	105	72
Mean	86.23	84.03	57.01
Std. Deviation	11.377	9.670	7.149

a) Results of Data Description of Adaptability in the World of Work Industry 4.0

This study has 154 respondents, namely XII grade students of SMKN 1 Blitar City and SMK Islam Blitar City and consists of 28 statement items. Based on the average adaptability in the industrial

world 4.0 obtained by students majoring in ITTL in Blitar City, the order indicators from highest to lowest are: (a) Ability to establish good interpersonal relationships with coworkers, (b) Ability to control oneself well, (c) Having self-satisfaction obtained from work, (d) Ability to understand potential and self-knowledge in adapting to the work environment, and (e) Ability to think critically and solve problems creatively.

Indicators of critical thinking and creative problem solving skills have a low level of meaningfulness. The ability to think critically and solve problems is a person's ability to make judgments and decisions based on valid evidence and logic. Based on the results of research, TITL vocational students in Blitar City are not good at critical thinking and problem solving. This ability is very necessary for SMK competency standards, so that students have provisions in adapting to the industrial world 4.0. It is expected that students can improve their ability to think critically and solve problems creatively, such as: having a high level of intelligence (HOTS) in using technology, making rational and logical decisions and solving complex problems. If vocational students are able to think critically and solve problems creatively, then they will easily and quickly make judgments and decisions. Can be seen in Table 9 descriptive statistics as follows.

Table 9 Descriptive Statistics of Adaptability in the World of Work Industry 4.0

Adaptability in the World of Work Industry 4.0	Actual		Ideal		
	Range	Median	Min	Max	Average
	28-112	70.00	50	112	86.23
a) potential and self-knowledge innovatively in adapting to industry 4.0	4-16	10	4	16	11.42
b) Critical thinking and creative problem solving in adapting to industry 4.0	4-16	10	4	16	11.35

c) Good self control in adapting	6-24	15	6	24	19.72
d) Having the self-satisfaction gained from the work of adapting	6-24	15	6	24	17.99
e) Establish good interpersonal relationships with coworkers in adapting to the world of Industry 4.0	8-32	20	8	32	25.77

After finding the length of the interval class, then calculate the range using the following formula:

$$= \frac{f}{N} \times 100\%$$

Description:

P : percentage

F : frequency

N : number of respondents

Table 10. Frequency Distribution of Adaptability in the World of Work Industry 4.0

Criteria	Interval (i)	Frequency (f)	Presentation (%)
Very High	91 – 112	62	40.26%
High	77 – 91	66	42.86%
Low	49 – 63	7	4.54%
Very Low	28 – 49	0	0%
	154		100%

Based on the description of variable data, it can be seen in Figure 3 Pie Chart of adaptability in the world of industrial work 4.0, below:

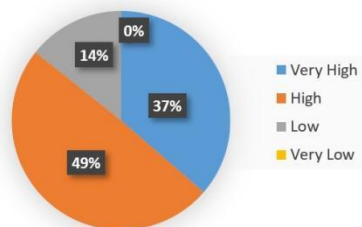


Figure 3 Adaptability in the World of Work Industry 4.0

Based on the pie chart, it is concluded that the level of self-confidence of 154 students has their

respective categories, namely 56 students (36.36%) tend to be very high, 76 students (49.35%) tend to be high, 22 students (14.29%) tend to be low and 0 students (0%) tend to be very low. From this explanation, the ability to adapt in the industrial world of work 4.0 students in Blitar City class XII is included in the high category.

b) Data Description Results of Engineering Knowledge

This study has 154 respondents, namely XII grade students of SMKN 1 Blitar City and SMK Islam Blitar City and consists of 28 statement items. Based on the average scores in engineering subjects obtained by students majoring in TITL in Blitar City, the order from highest to lowest is: (a) Electrical Motor Installation / IML, (b) Electrical Power Installation / ITL and (c) Electrical Lighting Installation / IPL. This shows that there is a need to improve engineering knowledge in the subject of Electrical Lighting Installation/IPL.

Indicators of electrical lighting installation with the lowest level of meaningfulness. The low understanding of lighting installations is due to several factors, including: teacher teaching performance in delivering material, lack of utilization of learning facilities, and student motivation. An electrical lighting installation is an installation used to provide electrical power with a load in the form of lighting components.

Based on the results of research on TITL vocational students in Blitar City, there is a lack of understanding regarding electrical lighting installations. This understanding is very necessary for the standard competencies of productive subjects for vocational students related to the electrical field, so that students have the provision to adapt to the industrial world. It is hoped that students can increase their understanding of electrical lighting installations so that they are able to have engineering knowledge, such as: components, materials, connecting panels, general requirements for pipe installation, understanding electrical lighting installations, operating lighting and installing installations (lighting, panels and lightning). If SMK students have sufficient understanding of electrical lighting installations, they will easily and quickly explain, apply and practice them. More complete results can be seen in Table 11 Descriptive Statistics of engineering knowledge.

Table 11. Descriptive Statistics of Engineering Knowledge

Engineering Knowledge	Actual		Ideal		
	Range	Median	Min	Max	Average
	28-112	59	60	105	84,03
a) Electrical Motor Installation	10-40	15	10	40	29.12
b) Electricity Lighting Installation	9-36	22	9	36	26.87
c) Electrical Power Installation	9-36	32	9	36	28.36

After finding the length of the interval class, then calculate the range using the following formula:

$$= \frac{f}{N} \times 100\%$$

Description:

P : percentage

F : frequency

N : number of respondents

Table 12. Frequency Distribution of Engineering Knowledge

Criteria	Interval (i)	Frequency (f)	Presentation (%)
Very High	91 – 112	40	25.97%
High	77 – 91	86	55.84%
Low	49 – 63	4	2.6%
Very Low	28 – 49	0	0%
	154		100%

Based on the description of the variable data above, it can be seen in Figure 4 pie chart of engineering knowledge, as follows:

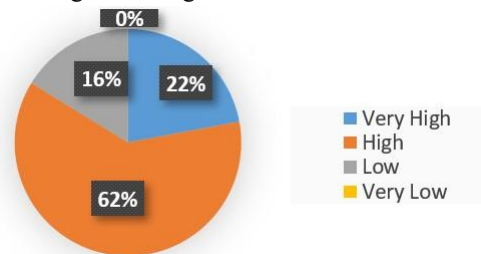


Figure 4 Engineering Knowledge

Based on the pie chart above, it can be concluded that the engineering knowledge of 154 students has their respective categories, namely 34 students (22.08%) tend to be very high, 95 students (61.69%) tend to be high, 25 students (16.23%) tend to be low and 0 students (0%) tend to be very low. From this explanation, the engineering knowledge of students in Blitar City class XII students is included in the high category.

c) Results of Self-Confidence Level Data Description

This study has 154 respondents, namely XII grade students of SMKN 1 Blitar City and SMK Islam Blitar City and consists of 18 statement items. Based on the average level of self-confidence obtained by students majoring in TITL in Blitar City, the order from highest to lowest is: (a) Believe in one's own abilities, (b) Act independently in making decisions, (c) Have a positive self-concept, and (d) Dare to express opinions.

Daring to express opinions has a low level of meaningfulness. Dare to express an opinion is a courage in speaking, the attitude before and after expressing an opinion. A person must have the ability to socialize and broaden their horizons about the environment, in order to improve one's assertive behavior.

Based on the results of the above research, students of SMK TITL skill competency in Blitar City are not good at expressing opinions by drawing conclusions that students of SMK TITL skill competency in Blitar City. This ability is very necessary for SMK competency standards, so that students have provisions in adapting to the industrial world 4.0. It is hoped that students can increase their courage to express opinions, such as: commenting on others when they are late in completing projects, socializing and establishing relationships with others and broadening their horizons. This ability is one of the abilities that must be possessed by TITL competency vocational students as a provision for adapting to the industrial world 4.0. If SMK students dare to express their opinions, then they will have the courage to express their opinions quickly and accurately. More complete results can be seen in Table 20 Descriptive Statistics of Self-Confidence Levels

Table 13. Descriptive Statistics of Self-Confidence Level

Self Confidence Level	Actual		Ideal		
	Range	Median	Min	Max	Average
	18-72	45	29	72	57.01
a) Belief in one's own ability	5-20	12.5	5	20	bngxx xx1 6
b) Acting Independently in Decision Making	5-20	12.5	6	20	15

c) Having a Positive Self Concept	4-16	10	4	16	13
d) Dare to Express Opinion	4-16	10	5	16	13

After finding the length of the interval class, then calculate the range using the following formula:

$$= \frac{f}{N} \times 100\%$$

Description:

P : percentage

F : frequency

N : number of respondents

Table 14. Frequency Distribution of Self-Confidence

Criteria	Interval (i)	Frequency (f)	Presentation (%)
Very High	56 – 72	91	59.09 %
High	47 – 56	53	34.42 %
Low	34 – 41	2	1.3 %
Very Low	18 – 34	1	0.65 %
	154		100%

Based on the data description above, it can be depicted in the pie chart of the self-confidence level variable in Figure 5, as follows:

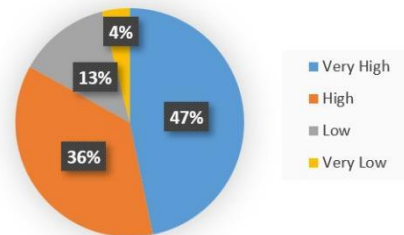


Figure 5 Tendency of Self-Confidence Level

Based on the pie chart above, it can be concluded that the level of self-confidence of 154 students has their respective categories, namely 72 students (46.75%) tend to be very high, 56 students (36.36%) tend to be high, 20 students (12.99%) tend to be low and 6 students (3.90%) tend to be very low. From this explanation, the level of self-confidence of students in Blitar City class XII students is included in the very high category.

4. CONCLUSION

4.1 Conclusion

Based on the results of research and discussion in this study, conclusions can be drawn: (1) The adaptability variable in the industrial world 4.0 of vocational students majoring in ITL in Blitar City is in the high category, (2) The engineering knowledge

variable of vocational students majoring in ITL in Blitar City is in the high category, (3) The level of self-confidence of vocational students majoring in ITL in Blitar City is in the very high category, (4) There is a positive and significant partial relationship between the engineering knowledge variable (X1) and adaptability in the industrial world 4.0 (Y) students of SMK TITL skill competence in Blitar City, (5) There is a positive and significant partial relationship between the variable level of self-confidence (X2) with adaptability in the industrial world 4.0 (Y) students of SMK TITL skill competence in Blitar City, and (6) There is a positive and significant simultaneous relationship between the variables of engineering knowledge (X1) and level of self-confidence (X2) with adaptability in the industrial world 4.0 (Y) students of SMK TITL skill competence in Blitar City.

4.2 Suggestions

Based on the results of the research and discussion, suggestions can be given: (1) For Schools, aspects that can affect students' ability to adapt in the industrial world 4.0, high value indicators can be used as guidelines in preparing the school curriculum on the abilities needed to face technological developments in the era of the industrial revolution 4.0, and the school can provide training to teachers about Technological Pedagogical Content Knowledge (TPACK) which is more detailed in learning various software such as IoT, AI and so on related to electrical power installation to support soft skills and hard skills related to engineering knowledge and self-confidence levels, (2) For students, it is hoped that students will be able to realize the skills in themselves, and (3) For other researchers, it is hoped that future researchers who will examine the topic of adaptability can develop and deepen aspects of cognitive flexibility abilities that have not been revealed with sentences that are more effective and easily understood by students.

REFERENCE

[1] A. Y. Wafi, Get to know more deeply what is the Industrial revolution 4.0. (Online), (<https://www.kompasiana.com/wafiahmad/5dc6752d541df3e090b6772/men-genal-more-in-depth-what-is-the-industrial-revolution-4-0>), accessed April 18, 2022, 2019.

[2] Zimmerman, Preparing Indonesian Human Resources in the Industrial Age 4.0. Jakarta:

Ministry of Research, Technology and Higher Education, 2018.

- [3] V. Satya, Indonesia's Strategy to Face Industry 4.0. Research Center of the House of Representatives Expertise Agency. *Journal of Brief Studies on Actual and Strategic Issues*, (Online) 10 (9), (<https://bikinpabrik.id/wp-content/uploads/2019/01/Info-Singkat-X-9-I-P3DI-Mei-2018-249.pdf>), accessed May 15, 2020), 2018.
- [4] S. A. Boylan, Developing Organizational Adaptability for Complex Environment. *Journal of Leadership Education*, 2017, pp. 183-198. DOI: 10.12806/V16/I2/T2
- [5] M. D. Ali, *Psikologi Remaja : Perkembangan Peserta Didik*, 2015, Jakarta: Bumi Aksara.
- [6] S. Stevani, Pengaruh Praktek Kerja Industri (Prakerin) dan Keterampilan Siswa terhadap Kesiapan Memasuki Dunia Kerja Siswa Administrasi Perkantoran SMK N 3 Padang, *Economica: Jurnal Program Studi Pendidikan Ekonomi STKIP PGRI Sumatera Barat*, 3(2), 2015, pp. 184-193. DOI:10.22202/economica.2015.v3.i2.255
- [7] Desmita, *Psikologi Perkembangan Peserta Didik*, 2017, Bandung: PT Remaja Rosdakarya.
- [8] S. Putro, Social Cognitive Content to Facilitate the Development of Adaptability of Prospective Teachers in the Curriculum of S1 PTE Study Program in LPTK, 2017, Malang: Unpublished dissertation.
- [9] M. N. Gufron, *Teori Psikologi*, 2017, Jogjakarta: Ar-Ruz Media.
- [10] H. Hendriana, *Hard Skills dan Soft Skills Matematik Siswi*, 2017, Bandung: PT Refika Aditama.
- [11] Anonymous, Open unemployment rate (TPT), 2020, National Statistics Agency.
- [12] C.A. Putri, News: News Most vocational graduates become unemployed. CNBC, (Online) (<https://www.cnbcindonesia.com/news/20211105145142-4-289309/duh-lulusan-smk-paling-banyak-jadi-pengangguran>), 2021.
- [13] A. Gavriila, The Relationship between Engineering Knowledge and Self-Confidence Level on the Ability to Adapt to the World of Industry 4.0 in TITL Competency Vocational Students in Blitar City, interview Mega Sefyana, 2022

- [14] S. Arikunto, Dasar-dasar Evaluasi Pendidikan, 2013, Jakarta: Bumi Aksara.
- [15] Sugiyono. Metode Penelitian Manajemen, 2018, Bandung: Alfabet.
- [16] S. Susanto, Cara mudah belajar SPSS dan Lisrel : Teori dan aplikasi untuk analisis data penelitian, 2015, Bandung: Alfabeta.
- [17] I. Ghozali, Aplikasi Analisis Multivariate dengan Program IBM SPSS 19 Edisi 5, 2018, Semarang: UNDIP Press.

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