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Employment 5.0: The Relationship Between Students' Perception of Welding Technology Courses and The Work Readiness

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ABSTRACT

Work readiness is an important factor in overcoming the high unemployment rate of college graduates. Various efforts have been made to improve the quality of work readiness, such as through welding technology courses. However, practical contributions measured through statistical analysis have never been made to date. The purpose of this study is to analyze the relationship between students' perceptions of welding technology courses and work readiness. This type of research was ex-post facto research with a quantitative approach. The data collection technique used a questionnaire technique. The data analysis technique used correlational inferential analysis. The results of the study indicate that students' perceptions of welding technology courses (X) have a relationship with work readiness (Y) in the moderate category (r = 0.577) with the amount of contribution based on the coefficient of determination (r^2 = 0.333) which means that variable X contributes 33.3% to Y. Based on the regression coefficient (b = 0.228) which shows that if variable X increases by 1 unit then variable Y increases by 0.228. The implications of this study indicate that welding technology courses make a moderate contribution to improving work readiness.

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INTRODUCTION

Unemployment among university graduates is still one of the main problems in Indonesia. Previous research reports show that in 2024 there will be an increase in unemployment from Applied Bachelor's Degree (IV), Bachelor's Degree (S1) Master's Degree (S2) and Doctoral Degree (S3) college graduates (Revo, 2024). College graduates are ranked third from other graduates (Elementary, Junior High, High School/Vocational School). Based on BPS data, there has been an increase in unemployment among university graduates from 5.52% in February 2023 to 5.63% in February 2024 (BPS, 2024). The factors that cause the high unemployment rate of college graduates are low salaries, incomplete

information about job vacancies, and graduate skills that do not meet industry standards or the world of work (Sparrow et al., 2020). The latest issues of employment 5.0 and industry 5.0 in the world of work are important points that need to be considered in overcoming the high unemployment rate.

Employment 5.0 refers to the social and technical conditions of a skill that are influenced by technological changes in the job market such as industry 5.0 as the current trend (Kolade & Owoseni, 2022). Industry 5.0 is a strategic and crucial issue today in the world of work. Industry 5.0 is defined as the fifth industrial revolution that emphasizes the aspect of collaboration between human creativity as experts who collaborate with advanced, intelligent, accurate, and efficient technologies to achieve increased productivity by considering a harmonious work environment (Maddikunta et al., 2022; Rame et al., 2024). This condition has an impact on the gap between industrial needs and the competence of prospective workers which causes a high unemployment rate (Dhondt et al., 2022; van Laar et al., 2022). Work readiness is one of the alternative factors that can be prepared to overcome the problem of unemployment in facing the needs of the job market (Inderanata & Sukardi, 2023).

Work readiness is the ability, skills, and work attitude that are in accordance with the needs and demands of the job and are adjusted to the conditions of society (Kholifah et al., 2025). The work readiness indicator refers to the extent to which graduates have the skills, attitudes, and attributes they have to succeed in the world of work (Persia et al., 2024; Qu et al., 2025). The scope of work readiness is in the form of the physical and mental qualities of prospective workers to the work discipline engaged in through their experience (Muspawi & Lestari, 2020). A research report shows that the skills, motivations, talents, interests, and ideals of college graduates that refer to completing tasks effectively and efficiently greatly affect work readiness (Krisnamurti, 2017). A study reinforces these findings where the results show that skills are one of the factors that affect work readiness (Amundson et al., 2016). Graduates with a good education have good knowledge, skills, and attitudes as indicators of work readiness (Rogers et al., 2021). This shows that work readiness can allegedly be formed through learning.

The understanding and interpretation of information (stimulus) directly into the human brain through all its sensory apparatus is known as perception (Pradipta, 2013). Perception is the process or result of recognizing and understanding events, objects and stimuli received through the senses (Fitri & Ernawati, 2023). Perception is categorized into two factors, namely external factors and internal factors. Internal factors include experiences, needs, judgments, and expectations, while external factors include the nature of the stimulus, outward appearance, and environment (Arifin et al., 2017). The level of work readiness can be influenced by several factors, namely ability factors, academic factors, behavioral factors and self-potential, innate/inherited factors (Ihsan, 2018). The perception referred to in this study is a person's perception in learning welding technology.

Learning is the assistance provided by educators so that there can be a process of acquiring knowledge, mastering skills and habits, as well as forming attitudes and beliefs in students (Directorate

Education & Learning, 2019). Learning outcomes have several supporting factors in the form of affective, knowledge, science, skills, and competencies (Jayanto, 2014). Practical learning is one form of such learning. Practical learning is a learning based on real-world context that students do professionally in laboratories, workshops, and the field in a way that is based on their disciplines (Forbes et al., 2023). Practical learning has three main components, namely the teaching and learning component, the lecturer ability component, and the facilities and infrastructure component (Ratnawati & Vivianti, 2020). The welding technology course is one of the practical learning carried out in vocational education.

The welding technology course is a core practice course that aims to produce professional welders according to the needs of the world of work. A professional welder is someone who has important and much-needed skills in the manufacturing industry (Chan et al., 2022). Professional welders must at least have hard skills and soft skills. Hard skills are technical, real, and measurable abilities related to the use of welding equipment (Lyu & Liu, 2021). While soft skills are essential skills in the workplace that include emotional intelligence, communication, creativity, problem-solving, team building, and management (Dell'Aquila et al., 2017; Lamri & Lubart, 2023). A study found that soft skills that include honesty, responsibility, confidence, ethics, cooperation, creativity, communication, and leadership can be integrated into welding practice learning (Putra & Kartowagiran, 2017).

Based on the description above, the output of welding technology courses that include hard skills and soft skills in the field of welding needed by the world of work is suspected to have relevance to work readiness. This is due to work readiness which refers to a person's work readiness which is characterized by mastery of skills, attitudes, and attributes according to the needs of the world of work which is the same as welding learning output. Some studies conducted previously only examined the relationship between industrial work practices, hard skills, and soft skills with work readiness (Afandi et al., 2022; Susanti Siregar et al., 2024; Wiharja MS et al., 2020). The study of work readiness linked to the lecture on welding technology is an explicit and specific study that has never been studied before. Therefore, the purpose of this study is to find out how much of a relationship there is between students' perceptions of welding technology courses and work readiness that has not been empirically studied. Based on the description above, research questions in this study are how does students' perception of welding technology courses relate to student work readiness?

METHOD

Research design

This research is a type of *ex-post facto research* using a quantitative approach. The justification for this type of selection is because the variables of students' perception of welding technology courses and work readiness have occurred before so that there is no treatment. The quantitative approach was chosen because the results of the research were contained in the form of statistically analyzed figures.

Participants

The type of sampling technique used in this study is a type of purposive sampling because the selected participants have special characters. The criteria for participants in this study are Automotive Engineering Education students who are part of vocational education as many as 64 people, all 7th semester students. Participants are active students who have taken welding technology courses, have carried out fieldwork practices, and have completed industrial work assignments in the form of technological innovation products.

Data collection techniques

The data collection technique used in this study is a questionnaire method on two variables, namely students' perception of welding technology courses (SPWTL) and work readiness variables. The data collection mechanism is carried out face-to-face in the classroom through the online distribution of questionnaires given directly to participants. After an explanation of the filling procedure, participants were given time to fill out the questionnaire in 7 days in the odd semester of the 2023/2024 academic year.

Research instruments

The instrument used was in the form of a questionnaire sheet with 5 alternative answers. The number of items of students' perception instruments about welding technology courses is 32 statements. As for the work readiness instrument, the number of instrument items is 18 statements. The SPWTL and work readiness instrument grid in detail can be seen in Table 1.

Table 1. SPWTL instrument grid and work readiness

Variable	Indicator	Items	Total
Students' perception of welding technology courses	Quality of materials and learning	1-7	7
	Quality of practice implementation	8-13	6
	Assessment and learning outcomes	14-16	3
	Lecturer competence	17-22	6
	Learning facilities and resources	23-29	7
	Relevance and career orientation	30-32	3
Work readiness	Professional work competencies	1-6	6
	Problem solving	7-9	3
	Work together	10-12	3
	Ambitious to progress (progressive)	13-15	3
	Adaptive	16-18	3

Validity test and reliability test

The validity test of the instrument used is a theoretical test and an empirical test. The theoretical test was carried out through the consideration of 2 experts. Furthermore, the two instruments of students' perception of welding technology courses and the work readiness instrument were empirically tested by

testing questionnaires to 32 Mechanical Engineering Education students with the same characteristics as the research participants. The results of the empirical test were then analyzed using Pearson Product Moment by correlating the total score with all items. The results of the empirical validity test have met the validity test criteria with the results of the calculation where the value of $r_{count} > r_{table}$ (0.361) on all variables. Based on these criteria, all instruments are categorized as meeting the validity test (Raharjo, 2021).

The reliability test of the instrument uses Cronbanch's Alpha test. The selection of this technique is because the instrument used is a non-tets type questionnaire. The results of the instrument reliability test in detail can be seen in Table 2.

Table 2. Instrument reliability test results

Instruments	*Cronbach's Alpha*.	Information
SPWTL	0,947	Reliable
Work Readiness	0,896	Reliable

Based on Table 2, the results of the reliability test of the two instruments about students' perception and work readiness are included in the reliable category where the test value is greater than 0.60 (Sujarweni, 2015). The reliability obtained is strong with a value above 0.79.

Data analysis

The data analysis techniques used in this study include descriptive data analysis techniques and inferential analysis techniques. Descriptive analysis includes highest score, lowest score, ideal mean (Mi), ideal standard deviation (SDi), calculated mean, calculated deviation standard, error standard. To obtain Mi and SDi the following equation is used:

$$\text{Ideal Mean} = \frac{1}{2}(\text{max} + \text{min}) \quad \text{..... (1)}$$

$$\text{Ideal Standard Deviation} = \frac{1}{6}(\text{max} - \text{min}) \quad \text{..... (2)}$$

Next, to analyze the level of each variable using data categorization interpretation. Data categorization refers to the equations that can be seen in Table 3.

Table 3. Data categorization (Azwar, 2012)

Interval	**Category**
$X \geq Mi + Sdi$	good
$Mi - SDi \leq X < Mi + Sdi$	fair
$X < Mi - Sdi$	poor

The inferential data analysis technique used in this study is a parametric data analysis technique after the research data has met the data normality requirements. The normality test in this study used the Kolmogorov-Smirnov Test because the participants were larger than 50 people. Furthermore, the linearity test was conducted as a prerequisite test for other analyses to obtain a linear relationship

between students' perceptions of the welding technology courses and work readiness. The linearity test was carried out by comparing the value of the F_{count} with the F_{table} which was strengthened by the value of Sig. deviation from linearity where if the value of Sig. is greater than 0.05 then it is assumed to be linear (Raharjo, 2021). The research hypothesis test uses a simple correlation test with the Pearson Product Moment, while the regression test, the type of test used is a simple linear regression test. The hypothesis test was carried out to find the value of the correlation coefficient (r), the determination coefficient (r^2), the level of significance (t_{count}), and the regression coefficient (b) to answer the research question. Inferential data analysis was carried out using *the Statistical Packages for Social Science* (SPSS) application.

RESULTS AND DISCUSSION

Result

SPWTL level and work readiness

The results of the analysis of the level of students' perception of welding technology courses and work readiness in a statistically descriptive manner can be categorized as high (have good quality). The SPWTL level is categorized as good with an average score of 139.4. The level of work readiness was also obtained with good results with an average score of calculation (75.6). In detail, the results of the descriptive data analysis of the level of students' perception of welding technology courses and work readiness can be seen in Table 4.

Table 4. Results of descriptive data analysis at SPWTL level and work readiness

Variable	M	Mi	SD	SDi	SE
SPWTL (X)	139,4	96	15,38	21,3	1,92
Work Readiness (Y)	75,6	54	6,08	12	0,76

M= mean, Mi = mean ideal, SD = standard deviation, SDi = standard deviation ideal, SE = standard error

Based on the results of the data categorization in Table 5, the level of students' perception of welding technology courses (X) and work readiness (Y) is categorized well based on the percentage. First, in the variable of students' perception of welding technology courses, 61 respondents were obtained with a percentage of 95%. Furthermore, in other categories, there were only 2 (3%) respondents who were in the sufficient category and only 1 person (2%) respondent who was in the insufficient category. Second, in the work readiness variable, 57 respondents (89%) were categorized as having good work readiness. Meanwhile, in the sufficient category, only 7 people (11%) of respondents participated. In the less category, there are no respondents in that category.

Table 5. Categorization of SPWTL levels and work readiness

Interval		Frequency		Percentage (%)		Category
X	Y	X	Y	X	Y	
X ≥ 117.3	X ≥ 66	61	57	95	89	Good
74.7 ≤ X < 117.3	42 ≤ X < 66	2	7	3	11	Enough
X < 74.7	X < 42	1	0	2	0	Less

SPWTL inferential statistical test on work readiness

Analysis prerequisite test

The results of the normality test used the Kolmogorov-Smirnov Test with the results of the Asymp value. Sig (0.200) which means that the data is normally distributed. The results of the normality test can be seen in Table 6.

Table 6. Data normality test results

Asymp. Sig	Significant level	Information
0,20	0,05	Usual

The results of the linearity test of the relationship between X and Y are assumed to be linear with the value of $F_{count} > F_{table}$ which is strengthened with the value of Sig. > 0.05. The results of the linearity test in detail can be seen in Table 7.

Table 7. Data linearity test results

Variable	F_{Count}	F_{table}	Sig.
X against Y	30,93	4,00	0,233

Simple regression test

The results of the research hypothesis test obtained a correlation coefficient value (r) of 0.577 which means that the relationship between students' perception and work readiness is included in the medium category based on the interpretation of correlation data (0.40-0.599). Based on the determination coefficient value (r^2) of 0.333, it shows that students' perception of welding technology courses affects work readiness by only 33.3% while 66.7% that affect work readiness are from other factors. The results of the significance test obtained showed that the relationship between students' perception and work readiness had a significant relationship where the value of $t_{count} > t_{table}$ was strengthened with a value of Sig. < 0.05. The data from the research hypothesis test can be seen in Table 8.

Table 8. Research correlation results

Variable	r	R^2	t_{Count}	t_{Table}	Sig.
X against Y	0,577	0,333	5,561	1,999	0,000

r = correlation coefficient, r^2 = determination coefficient

Based on Table 9, the value of constant (b) is 43.821 which means that when the variable of students' perception of welding technology courses (X) is at zero, then the variable of work readiness is predicted to be 43.821. This constant is categorized as significant which is shown by the comparison of the value t where the $t_{count} > t_{table}$ and this result is also reinforced with the p-value < 0.05. The results of the regression coefficient of the variable of students' perception about welding technology courses of 0.228 showed that there was a positive influence where the higher the level of students' perception of welding technology lectures, the higher the level of work readiness.

Table 9. Regression coefficient

Variable	Regression Coefficient (b)	*Std. error*	t-value	P-value
Constant	43,821	5,753	7,617	0,001
SPWTL (X)	0,228	0,041	5,561	0,001

The regression equation from students' perception of welding technology courses on work readiness was formulated into a regression equation Y = 0.228X + 43.821. The interpretation of the equation shows that if the variable of students' perception of welding technology courses increases by one unit, then the variable of work readiness increases by 0.228. A regression graph between students' perceptions of welding technology courses on visual work readiness can be seen in Figure 1.

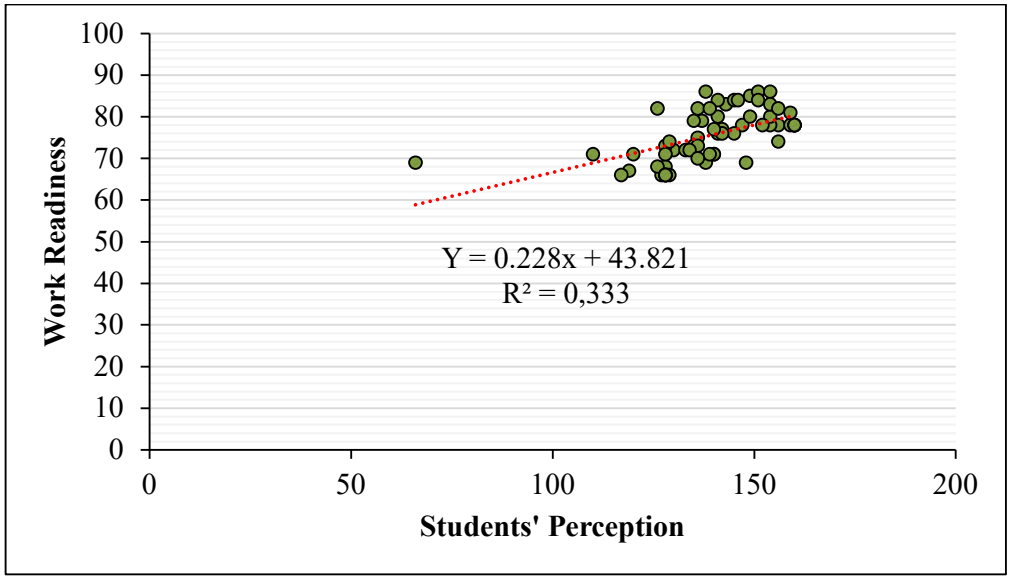

Figure 1. Simple linear regression graphs of X and Y

Discussion

The main findings of this study show that students' perception of welding technology courses and work readiness has a significant relationship in the medium category. This is strengthened by the value of the SPWTL determination coefficient of 33.3% for work readiness which is also included in the medium category (Chin, 1998). The correlation value in the medium category is because SPWTL is not the only dominant factor that affects work readiness. Other research reports show that the most

dominant factors of work readiness include motivation, off-campus practical experience, students' expectations in entering the workforce, vocational guidance, sources of information on job vacancies, talents, physical strength, personality, appearance, and career opportunities (Syarif et al., 2019). Other studies reinforce that work readiness for students today is not enough through learning alone, but needs to be improved through internships and digital literacy (Naufalin et al., 2024) .

To be able to produce optimal work readiness, welding technology courses pay attention to two factors, namely internal factors that include motivation, interest, attention, hands on, and minds on and external factors that include facilities and infrastructure, the quality of educators, and curriculum (Inspiration et al., 2020; Zafeer et al., 2024). In addition, a study found that lecture success is strongly influenced by learning strategies (Saha et al., 2024). Increasing motivation, interests, facilities, lecturer competencies, and strategies in learning can be a supporting factor in increasing the results of welding technology courses in supporting student work readiness.

Technology that is in accordance with competencies is also another important factor in learning success (Mohammed et al., 2024). Welding technology is a type of practical learning that really needs the right technology. Practical learning includes training in the application of theory to real-world problems, training in independent activity planning, and training in the use of certain tools (Aflizah et al., 2024). Therefore, practical learning can improve a person's skills. This is in line with the findings of previous research which showed that there is a relationship between job skills and student work readiness (Rahman, 2018). Other research reinforces that there is a relationship between the implementation of practical learning and work readiness (Rahmanto & Gunadi, 2022).

Work readiness can also be formed through the implementation of a culture that is appropriate to the world of work in higher education, the selection of the right learning model, and a good education system (Yang et al., 2024). Work readiness can also be formed through a collaborative learning process, building good relationships between educators and graduates, and preparing students to face the changing needs of the world (Chigbu & Nekhwevha, 2022). These factors can be an alternative to increasing student work readiness.

CONCLUSION

The findings of this study show that there is a relationship (in the medium category) between students' perception of welding technology courses and work readiness. Even though it is in the medium category, the relationship between students' perception of welding technology courses and work readiness is significant. Students' perception of welding technology courses has a contribution of 33.3% (medium category) to work readiness. These results highlight that students' perception of welding technology courses is not the most important factor that affects work readiness. There are other factors that are more dominant on work readiness that are not studied in this study. Welding technology courses can be an alternative solution to increase work readiness supported by other variables such as internships and digital literacy. Future research should examine work readiness by considering the generational

categories of participants. Sample size from different types of vocational education can improve the accuracy of research findings.

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