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Relationship between the Implementation of Occupational Health and Safety and Practical Turning Learning Outcomes of Vocational High School Students

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Abstract

This research focuses on investigating the relationship between the implementation of occupational health and safety and the outcomes of lathe practice learning. The instruments used in this study involve the use of questionnaires, practical test scores, and documentation. The research method employed is quantitative with a correlational descriptive approach. The study was conducted at SMK Negeri 1 Lintau Buo, with the research subjects consisting of students in the 11th grade of Machining Engineering. The research was carried out in September, with a sample of 54 students divided into two classes: Class XI Machining Engineering 1 (28 students) and Class XI Machining Engineering 2 (26 students). The results of the data analysis indicate a significant and positive relationship between theoretical proficiency and practical outcomes, with a correlation coefficient of 0.459 and a significance value (two-tailed) of 0.000. Thus, it can be concluded that there is a positive and significant relationship between the implementation of occupational health and safety and the outcomes of lathe practice learning among 11th-grade students at SMK Negeri 1 Lintau Buo. These findings suggest that the relationship between the implementation of occupational health and safety and the outcomes of lathe practice learning falls into the moderate category.

Keywords: Learning Model, Project Based Learning, Learning Outcomes, Lathe Machine

Introduction

Education plays a crucial role in our lives. It is an activity that shapes and guides individuals towards maturity through the process of learning. The development of skills, talents, and attitudes in children is pivotal for fostering their creativity, which can contribute to future success (Kurnia Putra et al., 2022). Education is also defined as human efforts to create and cultivate physical and spiritual aspects in accordance with the cultural values and traditions prevailing in society. Moreover, education is referred to as a technique for shaping experiences, abilities, and norms that form the foundation of communal living (Abadi, 2022).

National education serves the function of harnessing potential and building dignity and honor in enlightening the life of the nation. The function of education is to enhance knowledge by integrating potential and being oriented towards the essence and dignity of a nation. The goal of learning is to enhance the potential of learners (Abadi, 2022; Kurnia Putra et al., 2022). Vocational education aims to enhance the faith and piety of students towards the Almighty, make students good citizens, improve students' ability to possess national knowledge, understand and appreciate cultural diversity, cultivate students who care about the environment and actively participate in preserving environmental sustainability, and utilize natural resources. Vocational High Schools (*Sekolah Menengah Kejuruan*/SMK) are institutions that produce experienced Human Resources (HR) in accordance with their respective fields of expertise. This is intended

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to develop the abilities of students so that they become graduates ready to enter the workforce (Abadi, 2022).

The dangers in workshops or laboratories can be divided into several parts, namely material handling, machine protection, use of hand tools, lighting, workplace conditions, vibrations, centers, and workgroups. The average risk of hazards in SMK workshops includes low risk, the need for management, the requirement for resolution actions, and in some cases, a lack of data (Thohir et al., 2019). Hazard control with high-risk requirements involves maintenance and improvement of conditions, especially in situations where corrective actions are not required. Maintenance recommendations are implemented through specific steps, such as setting goals, approaches, processes, and evaluating occupational health and safety conditions in the workshop (Sahlul Sahlul, 2019).

Safety is fundamentally a human need and an instinct for every living creature. Since humans settled on Earth, they have unconsciously recognized safety as a precautionary measure against various hazards in their environment. Occupational Health and Safety (OHS) is an effort to create a work environment that is safe, comfortable, and achieves the highest level of productivity. OHS is crucial and should be applied in all fields of work without exception, such as apartments, hotels, malls, and others, as the implementation of OHS can prevent and reduce the risk of accidents or illnesses due to work. OHS is a way to create a guaranteed work environment, protecting against work-related accidents, and can enhance the efficiency and productivity of work (Waruwu & Yuamita, 2016). OHS is a form of activity aimed at creating a safe working environment, free from diseases, to avoid the risk of workplace accidents or unwanted incidents. This is intended to enhance productivity and protect the well-being of workers as well as the assets of the company. Therefore, to prevent workplace accidents in a workshop, it is necessary to implement occupational health and safety factors (Irzal, 2016).

Based on observations and the researcher's experiences during the Field Experience Education Practice at one of the State Vocational High Schools, namely SMK Negeri 1 Lintau Buo, in the period of July-December 2022, in the 11th grade, several issues were identified, particularly in lathe machining learning. It was found that the lack of understanding of OHS by the participants and careless behavior during practicums could have fatal consequences for themselves and those around them. This issue arose because the understanding of OHS was not directly conveyed to the students as a separate subject. Knowledge about OHS was only acquired during practical sessions, causing the students to be less accustomed to behaving according to OHS standards when in the lathe workshop. They appeared indifferent, careless, and did not pay attention to their personal safety, ultimately impacting the low lathe machining practice scores obtained by the students.

Methods

Research Procedure

This research employs a quantitative method with a correlational analysis approach involving two variables, namely the implementation of Occupational Health and Safety (X) and the learning outcomes of lathe practice for eleventh-grade students in Machining Engineering (Y).

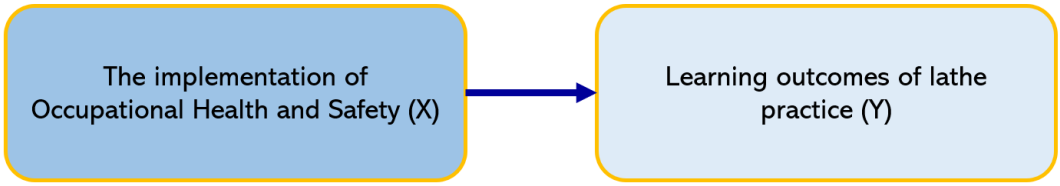

Figure 1. Research procedure

Descriptive research is used to portray or explain the research subject as it is, utilizing samples or population data, without conducting in-depth analysis and drawing conclusions (Martono, 2010). On the other hand, correlational research aims to identify whether there is a relationship between two or more variables, as well as the extent of correlation and the relationship between the two variables under investigation. Correlational research, as described by Satria and Dewanto (2017) and Waruwu and Yuamita (2016), is a type of study intended to determine whether there is a relationship between two or more variables (Arikunto, 2011).

Sample

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All eleventh-grade students of the Machining Engineering program at State Vocational High School 1 Lintau Buo, totaling 54 students, conducted their practical training at the Machining Workshop of State Vocational High School 1 Lintau Buo (Zulnanda, 2022).

Data Collection Techniques

The data collection technique involves the use of a questionnaire method aimed at assessing the extent of students' knowledge and implementation of Occupational Health and Safety.

Table 1. Questionnaire grid

Variable	Indicator
Implementation of occupational health and safety	1. Knowledge of Occupational Health and Safety 2. Implementation of Occupational Health and Safety

Finding and discussion

Descriptive analysis

This research is divided into two variables, namely the Implementation of Occupational Health and Safety (independent variable) and the learning outcomes of lathe practice (dependent variable).

Table 2. Frequency distribution of variable data

Aspect	Implementation of Occupational Health and Safety	Learning Outcomes in Practice
Valid	54	54
Mising	0	0
Mean	77.35	83.74
Median	78.00	84.00
Mode	78	80
Std Deviation	6.455	5.979
Variance	41.666	35.743
Range	29	23
Minimum	63	71
Maximum	92	94
Sum	4177	4522

The description of the OHS implementation data reveals the results of the analysis from 54 student respondents. The average score is 77.43, with a mode of 78, a median of 78.00, a maximum score of 92.00, a minimum score of 63.00, and a standard deviation of 41.666. The score range is 29. Meanwhile, for the description of the practical learning outcomes data, the analysis indicates that there are 54 student respondents. The average score is 83.74, with a mode of 80, a median of 84.00, a maximum score of 94, a minimum score of 71, and a standard deviation of 5.979. The score range is 23.

Normality and Linearity Testing

Normality test

The normality test was conducted using the Kolmogorov-Smirnov test. The normality test utilized the SPSS application version 26.0 and followed the criteria that values are considered normally distributed if the significance probability is (0.05). The test results are presented in Table 3.

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Table 3. Normality test

One-Sample Kolmogorov-Smirnov Test		
Aspect	**Penerapan K3**	**Hasil Belajar Praktek**
N	54	54
Mean	77.35	83.74
Std.Deviation	6.455	5.979
Absolute	.100	.110
Positive	.100	.068
Negative	-.077	-.110
Test Statistic	.100	.110
Asymp. Sig. (2-tailed)	.200[c,d]	.100[c]

The significance value of the normality test for the occupational safety and health implementation variable is 0.200, with a significance probability of 0.200 meeting the criteria (0.200 ≥ 0.05). Similarly, the significance value for the variable of welding practice learning outcomes is 0.100, and its significance level is 0.100 (0.100 ≥ 0.05), indicating that both datasets are normally distributed.

Linearity test

The criteria for this test are that if the F deviation value for linearity is significant at 0.05, then the data is linear. The results of the data analysis are presented in Table 4.

Table 4. Uji Linearitas

		Sum of Squares	**Df**	**Mean Square**	**F**	**Sig**
Practice Learning Outcome * Application of OHS	(Combined)	1075.463	21	51.213	2.001	.037
	Linearity	398.360	1	398.360	15.567	0.00
	Deviation from Linearity	677.103	20	33.855	1.323	0.234
	Within Groups	818.907	32	25.591		
	Total	1894.370	53			

The linearity test of the independent variables is> 0.05. Sig value. Deviation from linearity of the variable application of occupational safety and health (X) is 0.234> 0.05. It can be concluded that there is a linear relationship (Kurnia Putra et al., 2022).

Hypothesis Testing
Correlation test

The correlation test is used to understand the relationship between the independent variable and the dependent variable.

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Table 5. Hypothesis Test

Correlations			
		OHS Implementation	Practice Learning Outcomes
OHS Implementation	Pearson Correlation	1	.459**
	Sig. (2-tailed)		.000
	N	54	54
Practice Learning Outcomes	Pearson Correlation	.459**	
	Sig. (2-tailed)	.000	
	N	54	54

The results of the hypothesis test above show that the correlation coefficient (rcount) is 0.459 r count> r table 0.263, then Ha is accepted. This states, there is a relationship between the implementation of K3 on the learning outcomes of student lathe practice.

Determinant test

The value of the correlation coefficient (R) of the variable Application of Occupational Safety and Health (K3) with student practical learning outcomes is 0.459. Meanwhile, the determinant correlation value (R2) is 0.210. This means that the application of K3 with student practical learning outcomes is 21.06% and the remaining 78.94% is related to other factors not examined.

Teble 6. Determinant Coefficient (R2)

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.459[a]	.210	.195	5.364

Based on the results of data processing through simple regression analysis, it is obtained that the Application of Occupational Safety and Health (K3) has a Relationship with Student Practice Learning Outcomes of students at SMK Negeri 1 Lintau Buo. This is indicated by the Sig value. <0.005, which is 0.01 <0.05. In addition, the results of hypothesis testing also inform that the Application of Occupational Safety and Health (K3) has a relationship with student practical learning outcomes at SMK Negeri 1 Lintau Buo, which is indicated by the value of tcount> ttable. It can be concluded that the tcount value of the Occupational Safety and Health variable and Practice Learning Outcomes has a Pearson Correlation of 0.459> 0.263 at a significance level of 0.05 That this proves a positive influence between the two variables.

Conclusion

Based on the research that has been done, a positive relationship is obtained between the relationship between the application of K3 on the learning outcomes of Lathe practice of students in class XI Machining Engineering SMK Negeri 1 Lintau Buo. namely 0.459. Meanwhile, the determinant correlation value (R2) is 0.210. This means that the application of OHS with student practical learning outcomes is 21.06% and the remaining 78.94% is related to other factors not examined (Waruwu & Yuamita, 2016).

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Declaration

Author's Contribution

Jefri Aditia as a data collector, lecturer Drs. Jasman, M.Kes. as the Director of this Research Concept, lecturer Drs. Irzal M.Kes. as Data Analyst, lecturer Zainal Abadi, S.Pd., M.Eng. as a lecturer evaluating research methods.

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Conflict interest

The author states that there was no conflict when conducting the research.

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