

# The Implementation of Occupational Health and Safety (OHS) in Machining Practical Learning (MPL)

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## ABSTRAK

Keselamatan dan Kesehatan Kerja (K3) merupakan hal yang sangat penting pada pelajaran teknik pemesinan di SMK, karena siswa sering melaksanakan praktik yang banyak kaitannya dengan benda-benda keras dan tajam. Penelitian ini bertujuan untuk menganalisis pelaksanaan keselamatan dan kesehatan kerja pada pembelajaran praktik pemesinan. Penelitian ini menggunakan pendekatan kuantitatif *ex-post facto*. Subjek penelitian di empat SMK bidang keahlian teknik pemesinan kelas XI dengan jumlah sampel sebanyak 172 orang. Pengumpulan data menggunakan survei, observasi, wawancara, angket, dan dokumentasi. Teknik analisis data pada penelitian ini yaitu analisis regresi. Hasil temuan menunjukkan pertama, terdapat pengaruh yang signifikan antara penerapan K3 terhadap pembelajaran praktik pemesinan. Kedua, hasil analisis pengaruh antara penerapan K3 terhadap pembelajaran praktik pemesinan masuk dalam kategori lemah. Ketiga, hasil sistesis dan evaluasi menunjukkan ada empat alasan atau faktor yang mempengaruhi lemahnya penerapan K3 dalam pembelajaran praktik pemesinan, antara lain masih kurangnya pengetahuan siswa tentang K3 secara mendalam, kurangnya fasilitas sekolah terkait K3, masih kurangnya persepsi siswa terkait pentingnya K3, dan masih kurangnya perilaku siswa tentang K3 (motivasi, disiplin, jujur). Kesimpulan pada penelitian ini adalah penerapan K3 pada pembelajaran praktik pemesinan bukan hanya tugas dari pemangku kepentingan, namun tugas dari setiap individu karena kesehatan dan keselamatan dalam bekerja merupakan salah satu aspek pendukung menuju kesuksesan.

## ABSTRACT

Occupational Safety and Health (K3) is essential in machining engineering lessons at vocational schools because students often carry out practices involving many complex and sharp objects. This research aims to analyze occupational safety and health implementation in machining practical learning. This research uses an *ex-post facto* quantitative approach—research subjects in class XI machining engineering in four vocational schools with a sample of 172 people. Data collection uses surveys, observations, interviews, questionnaires, and documentation. The data analysis technique in this research is regression analysis. The findings show first, there is a significant influence between the application of K3 on learning machining practices. Second, the analysis results of the impact of the application of K3 on learning machining practices are in the weak category. Third, the results of the synthesis and evaluation show that there are four reasons or factors that influence the inadequate implementation of K3 in learning machining practices, including the lack of student knowledge about K3, the lack of school facilities related to K3, the lack of student perception regarding the importance of K3, and the lack of student behavior regarding K3 (motivation, discipline, honesty). This research concludes that applying K3 in learning machining practices is the task of stakeholders and every individual because health and safety at work are some of the supporting aspects towards success.

## 1. INTRODUCTION

Education will have an impact on all aspects. Education itself is a conscious effort to prepare students through guidance, teaching, and/or training activities for their roles in the future. Education is also widely interpreted by various people, but the essence of education is the activity of transferring knowledge. One of the formal education systems in Indonesia is vocational school. Vocational school is one of the

educational institutions that are responsible for creating Human Resources (HR) who have the abilities, skills, and expertise so that graduates can develop their performance to enter the world of work (Bergren, 2023; Inderanata & Sukardi, 2023; Mustikawanto et al., 2019). Vocational school has a goal to improve the ability of students so that they can develop themselves following the development of science, technology, and the arts, as well as prepare them to enter the workforce and develop a professional attitude (Gao & Xie, 2018; Jin et al., 2022). Vocational schools must be able to prepare their graduates as prospective professional workers. For this reason, vocational schools are required to be able to develop their quality and relevance. One of the steps taken by vocational schools in order to improve their quality and relevance is to encourage all vocational schools to function as "Centers for the Development of Professional Culture" (Nurjanah & Sofiwati, 2019; Williams, 2020).

Learning activities do not only occur in schools, there are industrial practice activities in the real world of work which are highly emphasized to gain and improve work experience in the competitive world of work. National Education System Law no. 20 of 2003 article 15 states that vocational education is secondary education that prepares students especially to work in certain fields (Andriansyah & Kamalia, 2021; Kamdi & Mulya Dewi, 2019). From this explanation, it can be concluded that vocational schools are education that prepares students to enter the workforce, increasing abilities and skills for the younger generation of prospective workers is the responsibility of the world of education. Education is a very important factor in human life, so the HR development process must be carried out by increasing knowledge, skills and attitudes and values so that they can adapt to their environment (Indra et al., 2023; Widiansyah, 2018). Learning There is a teaching and learning process between teachers and students that will produce knowledge and skills that will be embedded in the depth of learning outcomes (Mazaya, 2019; Toomey & Heo, 2022). In relation to learning, in vocational school, there is practice-based learning. Practical learning is a method of conveying material and adding to students' experiences in education using either tools or objects, as demonstrated, which is expected to make students easier while at the same time being able to practice the material that has been taught (Fakhri et al., 2018; Syawal, 2020). Practical learning is often found in vocational schools, one of which is in machining engineering lessons.

Machining Engineering is a lesson in a productive skills program that contains the development of the production sector with a concentration on the design of industrial machines and aims to fulfill the needs of the business world and the industrial world. The learning of machining practices in vocational schools must pay attention to Occupational Health and Safety (OHS) because it relates to tools that can make students injured if they are not taken seriously (Razzano et al., 2023; Wijanarka et al., 2019). However, in fact, there are still many problems, such as the notion that OHS is not a serious matter. Handling work safety issues in a school or in a company must be taken seriously by the whole community (Alfalalah, 2021; Wireko-Gyebi et al., 2022). Occupational Health and Safety (OHS) issues are not only the concern of foremen, teachers, instructors, and directors. However, it must be the responsibility of everyone involved. This is also in line with the opinion of previous study which states that OHS matters are not just hanging banners or slogans, and OHS is not just an obligation that must be paid attention to by workers but must be fulfilled by the employment system, and students or workers are also obliged to be responsible for OHS (Hanani, 2021). There will always be a risk of failure in every work activity, whether due to careless planning and execution or unintentional consequences such as weather conditions and natural disasters. One of the occupational risks that occur is a work accident, which will have a negative impact; therefore, as many work accidents as possible must be prevented to reduce their impact. The key to it all is awareness of the risk of danger and behavior that is a habit for working safely and healthily. The government or agency needs to carry out OHS training according to the characteristics and needs of each job to maximize the knowledge and skills of workers in implementing occupational health and safety (Howell et al., 2018; Kursunoglu et al., 2022). However, the fact is that awareness about the importance of OHS is lacking, which results in injuries and deaths. This is a question mark, even though there have been many journals, books, and even laws that convey the importance of OHS, such as the OHS National Profile.

The OHS National Profile provides information on OHS legislation, mechanisms for establishing country policies related to OHS, infrastructure, social partnership arrangements, the operation of various partners for OHS, labor inspection, participants, related parties, statistics, OHS indicators, demographic data, general economics, various problems, and conditions for further development by the state (Hale et al., 2020; Indar et al., 2021). The data also serves as a basis for specification adjustments and the development of further national policies and programs in OHS. It can be concluded that the Ministry of Manpower really hopes that all components can use and refer to the National OHS Profile in planning, implementing, evaluating, and reviewing OHS implementation in each sector, such as institutions or agencies, employers' associations, trade union confederations, professional associations, colleges, and youth communities. With the existence of a National OHS Profile, it can carry out OHS culture effectively and sustainably to achieve quality and sustainable national development success so that it can compete with other developed

countries. Workforce protection consists of several aspects, including safety, health, worker morale, and labor, as well as behaviors and policies for workers that are in accordance with human dignity and in accordance with their work (Musungwa & Kowe, 2022; Ramli et al., 2020).

Even though there have been many laws regarding OHS, the real fact is that there are still many accidents due to non-compliance and not even knowing about OHS, which has a severe impact on workers, their families, and the community because it causes high health costs and so on. Of course, this is a big question: what about the implementation of machining practices in vocational schools? In vocational schools, students carry out around 70% more practical activities (Ifeoma Obidile, 2018; Suharno et al., 2020). It turns out that in vocational schools, especially in implementing machining practice learning, there are still many students who do not apply OHS, such as using Personal Protective Equipment (PPE), paying attention to OHS signs, or following standard operating procedures in-school workshops (Nabilah & Mardiana, 2017; Setiawan & Coenraad, 2020). Then it was emphasized that 1) the application of OSH in practical workspaces did not meet standards, 2) activities at school, internships, and work involved complex OHS problems, and 3) the behavior of workers or students in professions that do not comply with OHS (Chatigny, 2022; Nabilah A et al., 2023). Furthermore, OHS material already exists in basic subjects, but there is little training, it can be said that implementation in OHS is still minimal (Basori, 2018; Joniarta et al., 2022). The opinions and findings of previous studies made the researchers curious, so they conducted pre-observations at several vocational schools in Purworejo to ascertain the actual situation.

Based on the results of pre-observations of researchers at four Purworejo Vocational Schools (Purworejo 1 Public Vocational School, Purworejo YPP Vocational School, Purworejo TKM Vocational School, Purworejo YPT Vocational School) shows that in each of these Vocational Schools there are already several standard operating procedures (SOP) OHS. However, there are still a number of students from these schools who are negligent or have not paid further attention to OHS, including 1) OHS in the implementation of machining practice learning, 2) many students do not understand the importance of implementing OHS when practicing in the workshop and its impacts, 3) attitudes students who do not pay attention to OHS during practice, 4) lack of socialization about OHS, 5) lack of teacher action to sanction students who do not pay attention to and apply OHS SOP during machining practice in vocational school workshops. Based on the findings of previous research and initial observations at four Vocational Schools in Purworejo, especially the machining engineering department, there are still many students who do not understand specifically about OHS in machining practice learning.

Therefore researchers are interested in knowing more about the implementation of OHS in machining engineering lessons at Vocational School Purworejo, because OHS is seen as important to support the careers of students. The way the researchers will do this is by observing and studying OHS SOP in the school machinery workshop and then interviewing teachers and students regarding the implementation of OHS, then after conducting observations and interviews the researcher will distribute questionnaires to find out the magnitude of the influence between occupational health and safety on learning machining practice by using the regression method, then after obtaining the magnitude of the effect the researcher will analyze or cross-check by means of in-depth interviews and participant observation to find the background of this.

## 2. METHOD

This study uses the ex-post facto method with a quantitative descriptive approach. This research aims to find the causes of behavior change with participatory comparative studies of behavior that does not arise from an event without manipulation, usually leaning more towards statistics (Müller et al., 2013; Wiranto & Slameto, 2021). The subjects involved in this study were all 11<sup>th</sup> grade students at engineering vocational schools at Purworejo State Vocational School 1, Purworejo YPP Vocational School, Purworejo TKM Vocational School, and Purworejo YPT Vocational School, while a population of 297 with a sample of 172, sample calculations used the Isaac and Michael formulas. This research was conducted from May 9 to November 24, 2022. Data collection techniques in this study included 1) survey, 2) observation, 3) interviews, 4) questionnaires, 5) documentation. Observations in this study were to see the extent of the completeness or facilities in the school machining workshops, then interviews in this study to confirm the results of the observations and a few questions by interviewing several teachers and students majoring in machining engineering, then questionnaires in this study were used to measure the extent to which OHS implementation of vocational students majoring in machining engineering grade 11<sup>th</sup> in machining practice lessons in school workshops, and documentation was used to ensure that researchers actually conducted research in 4 machining engineering vocational schools in Purworejo district. The researcher conveys the observation, interview and questionnaire grids that were tested as show in Table 1, Table 2, and Table 3.

**Table 1. Observation Grids**

Item	Observation Results
Head protection device	
Eye and face protection	
Ear protection device	
Respiratory protective equipment	
Hand protection	
Foot protection	
Protective clothes	
Safety belts and straps	
Safety sign	
Warning sign	
mandatory sign	
Prohibition sign	
Fire sign	
Emergency & direction signs	
Fire protector	
First aid kit in the machining workshop	
Emergency numbers such as police, fire, and ambulance in machining shops	

**Table 2. Interview Grids**

Teacher	Student
Do you always motivate students about OHS before carrying out machining practices in school workshops?	Does the teacher always provide motivation about OHS before carrying out machining practices in school workshops?
Are there OHS signs in the school machining workshop?	Are there OHS signs in the school machining workshop?
Have students received OHS socialization at school so far?	Have you ever received OHS socialization from school?
How is the implementation of student OHS during machining practice in school workshops?	How do you implement OHS in the school machining workshop during practice?
Have students implemented OHS when carrying out machining practices in school workshops?	Have you implemented OHS during machining practice at school?

**Table 3. Questionnaire Grids**

Variable	Indicator	Number of Indicator Items
Occupational Health and Safety (OHS) (X)	Personal Protection Equipment (PPE)	6
	Work Inspection	5
	OHS signs	7
	Incident Reporting and Investigation	3
	Occupational Accidents and Diseases	2
	Maintenance and Emergencies	5
Machining Practical Learning (MPL) (Y)	Lathe Machining	9
	Milling Machining	9
<b>Total</b>		<b>46</b>

Before the researcher tested the hypothesis, the researcher tested the validity of the instrument with 1 expert in the field of vocational education and carried out an instrument trial to see how far the items made by the researcher were valid and reliable. There were several items that were not valid and reliable, so these items were deleted. In the following, the researcher describes several items that are invalid and reliable. 1) the Occupational Health and Safety variable (X) with 28 items and found 1 invalid item, so the item was deleted, 2) the Machining Practice Learning variable (Y) with 18 items and found 2 invalid items, so that the item is deleted. So, there are 3 items deleted, and as many as 43 items that the writer will test on a population of 172 people. Data analysis in this study used regression analysis, with the SPSS v26 application. Regression analysis is a research hypothesis analysis technique to test whether there is influence between one variable and another variable, which is expressed in the form of a mathematical equation (regression). There are two basic types of regression, namely, simple or partial linear regression

and multiple linear regression (Arnab, 2017; Atinafu et al., 2023). Determining the R Square value, if the R square value is 0.75 and above it is included in the strong category, if the R square value is 0.50 and above it is included in the medium category, and if the R square value is 0.25 and above it is included in the weak category (Klemelä, 2018).

### 3. RESULT AND DISCUSSION

#### Result

The analysis requirements test is intended to find out whether the data collected meets the analysis requirements, this test uses the selected statistical technique. The analysis requirements for this researcher are a normality test using the Kolmogorov-Smirnov test with a qualification of  $> 0.05$ , and the test is carried out using the Statistical Package for the Social Sciences (SPSS) v26 software. The results obtained can be seen in Table 4.

**Table 4. Normality Test Results**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		172
Normal Parameters	Mean	0.000000
	Std. Deviation	6.95960243
Most Extreme Differences	Absolute	0.067
	Positive	0.036
	Negative	-0.067
Test Statistic		0.067
Asymp. Sig. (2-tailed)		0.410

Based on Table 4, the Asymp value is obtained. Sig. (2-tailed) is 0.410 which means  $> 0.05$ . So, it can be concluded that the data tested is normally distributed and can be continued at a later stage. Researchers conducted research at four Vocational Schools in Purworejo, including Purworejo 1 Public Vocational School, Purworejo YPP Vocational School, Purworejo TKM Vocational School, and Purworejo YPT Vocational School. Hypothesis testing in this study was carried out to prove that the preconceived presumptions were proven by empirical data, as well as to determine the effect of the independent variable and the dependent variable. The hypothesis being tested is the influence of the Occupational Health and Safety (OHS) variable (X) and the Machining Practice Learning (MPL) variable (Y) at Purworejo Vocational School. Hypothesis testing uses partial regression testing, data management uses the help of SPSS (Statistical Package for the Social Sciences) software version 26. The basis for decision making is known, if the significance value is  $< 0.05$  then it is influential, if the significance value is  $> 0.05$  then vice versa. The findings of hypothesis testing with simple regression are R of 0.664, R square of 0.441, t-value of 11.575, and sig. of 0.000. It can be concluded that the application of OHS ( $X_1$ ) has a positive and significant effect on MPL (Y). Analysis of the influence of the implementation of OHS on the learning of vocational school machining practices in Purworejo showed in Table 5.

**Table 5. Coefficients and Model Summary Test Results**

Model		Unstandardized Coefficients B	R Value	r <sup>2</sup> Value	t Value
1	Constant	42.626	0.664	0.441	11.575
	Y	0.913			

Explanation of a simple regression line equation using the equation  $Y = a + bX$ . Get the value  $Y = 42.626 + 0.913X$ . From this equation it can be explained that the regression coefficient has a positive value of 0.913. This means that if OHS increases by 1%, then MPL will also increase by 0.913 or 9.13%. The correlation coefficient (r) between predictor  $X_1$  and Y showing that the coefficient of  $X_1$  on Y ( $rx_{1y}$ ) is 0.664 because  $rx_{1y}$  is positive, it can be seen that there is a positive influence between OHS and MPL. Apart from that, based on the interpretation of the coefficient level, included in the medium category with a coefficient interval of 0.74 to 0.50.

The price of the coefficient of determination  $X_1$  on Y ( $r_{1x_{1y}}$ ) is 0.441. This shows that OHS has a contributing influence on MPL of 44.1% while 55.9% is determined by other variables. Included in the weak category with a coefficient interval of 0.49 to 0.25. After processing the data, it can see the results of the analysis for decision making based on the t-count value obtained at 11.575. If consulted with a significance

level of 5%, it is known that the t-table value is 1.974. So, the test results are  $t\text{-count} > t\text{-table}$  or  $11.575 > 1.974$  so it can be concluded that there is a significant influence between the OHS variables on MPL. Based on the coefficients and model summary test results, positive and significant values were found, as evidenced by the results of the analysis above. However, the R and  $r^2$  values are in the medium and weak categories, so it is necessary to carry out a non-experimental evaluation (cross-check) for teachers and vocational students majoring in mechanical engineering in Purworejo to ascertain the actual situation.

Based on the findings and results of re-checking with the teacher who teaches practical machining lessons and 11<sup>th</sup> grade students in machining engineering, practicum support tools such as head protection devices, eye protection devices, and face protection devices were obtained, ear protection device, respiratory protective equipment, hand protection, foot protection, protective clothing, safety belts and straps, safety sign, warning sign mandatory signs, prohibition signs, fire signs, emergency and direction signs, fire protectors, first aid kits in the machining workshops, and emergency numbers such as police, fire, and ambulance in the machining shops are available and complete in the four workshops of the Purworejo vocational school. The teachers always provide motivation before and after carrying out machining practices in the school workshop; this is also felt by students from the four vocational schools. The four vocational schools always carry out outreach regarding OHS so that teachers and students remember how important it is. However, these OHS tools are used interchangeably during practice by students, and there are still many students who are careless or forget, so they must be reminded (seeking the attention of teachers and the opposite sex) to apply OHS during practice in school workshops, which results in students experiencing illness mild, a cough or sore throat, eye pain, and the like. Socialization activities are not carried out every semester but only once a year, and there is only one vocational school that collaborates with the company, namely the Purworejo 1 State Vocational School, which collaborates with Toyota. Based on these findings, the researcher concluded that there are four reasons or factors why the influence of OHS implementation on MPL in Purworejo vocational schools is included in the moderate and weak but significant categories, including 1) lack of knowledge about OHS; 2) lack of facilities from schools related to OHS; 3) lack of good student perceptions about the importance of OHS; and 4) lack of student behavior (motivation, discipline, honesty).

## Discussion

Based on the results of observations, interviews, and research hypotheses, it can be concluded that the four Vocational Schools in Purworejo have implemented OHS in machining engineering learning, as well as evidenced by the positive and significant results of hypothesis testing with a value of 0.000, this is in line with the research results which stated that there was a significant and positive value of 0.000 between the application of OHS during the Mechanical Practice of vocational schools, with the OHS knowledge category level of 76.12% being in the good category, the OHS requirements and Principles indicators were 98.51% being in the good category, the level of students' perceptions of OHS was in the good category of 95.52% (Adam et al., 2022; Zulfanda et al., 2022). So that it can be interpreted that if the implementation of OHS is good, then the application in any learning including machining practices in vocational schools is also good (Feszterová, 2015; Prameswari & Aisyah, 2023; Rizbudiani & Jaedun, 2021). If the implementation of OHS is not feasible, it will result in delays in the learning process in machining practicums at machining practice sites in schools. This is also in line with the opinion which states that the use of good personal protective equipment can contribute to OHS by 57.3% (Gultom, 2018), and findings of other study also stated the need for the use of complete personal protective equipment by students to protect the safety and health of students in machining practice and also the importance of awareness of students and teachers regarding safety and health in machining practice so as to avoid fatal work accidents (Arsy et al., 2022; Kursunoglu et al., 2022). Further findings also mentioned that OHS signs are very important for anticipating, minimizing casualties, providing a sense of security and personal safety, and students should understand the importance of OHS signs in order to reduce work accidents, and must apply OHS signs that have been installed in the machining workshop (Gonçalves et al., 2022; Kurniawan, 2020; Patriarca et al., 2019).

In order to avoid work accidents there are at least 2 things that must be considered, including: 1) knowledge of SOP OHS in the workshop, 2) Attitudes such as high motivation, good habits can also reduce the number of accidents and occupational diseases (Monalisa et al., 2022; Sultan, 2021; Taufan et al., 2019). Findings of other study mentioning knowledge, attitudes, compliance, supervision from teachers can anticipate accidents and occupational diseases in learning machining practices in workshops (Moula et al., 2022; Warphana & Sukardi, 2019). In the event of a work accident, every organization should have maintenance and emergencies (Ghasemi et al., 2022; Zhang et al., 2021). This is also explained by the that mentions there are at least 2 things that must be owned by the organization related to maintenance and emergencies, including: 1) has its own policy or a policy from a relevant organization, 2) has a protection system, such as fire extinguishers and so on (Salindeho et al., 2020). Findings of other study explains that

there are at least five efforts that must be made in maintenance and emergencies, including: 1) forming and implementing maintenance and emergency management, 2) establishing and carrying out maintenance and emergency procedures, 3) forming and implementing maintenance and emergency teams or emergency response team, 4) conduct maintenance and emergency training, 5) form and carry out security patrols for maintenance and emergencies (Konijn et al., 2018; Nara et al., 2019; Shan, 2022; Usman et al., 2022). The author describes four reasons or factors why the influence of implementing OHS on MPL at Porworejo Vocational School is included in the moderate and weak but significant categories.

OHS knowledge is very important, and greatly influences the implementation of machining practices in workshops. This is also explained by the findings that mentioning knowledge related to the application of OHS in the machining workshop. One of the OHS indicators is personal protective equipment and OHS signs (Pangeran et al., 2016; Pryor, 2019). Other studies shows the impact of the use of personal protective equipment can reduce the risk of accidents (Chung et al., 2023; Oliveira Neto et al., 2022). Then there is also research mentioning safety signs is a very important communication tool for accident prevention, fire safety, health hazard information, and emergency evacuation (Gungor, 2023). However, a low understanding score of some symbols conveys messages from symbols that are not effectively conveyed to the audience. One of the teachers at the YPP Purworejo Vocational School and TKM Purworejo revealed "so far students only know a little about OHS, so far in general they only know a little about personal protective equipment and OHS signs, not all of them know about these two things". Then students from the YPT Purworejo vocational school stated, "We don't really understand about OHS signs, sometimes we are also confused because there are so many of them, then we also forget to use personal protective equipment when practicing machining in the school workshop, which makes us feel a little sore throat and so on".

Facilities are very important for vocational students because vocational students are more concerned with practice than theory, about 70% practice and 30% theory. Previous research result states that the facilities in the machining workshop must be complete or that every single student gets all work safety facilities, in order to reduce the number of work accidents when students carry out machining practices (Putra et al., 2021; Sang et al., 2021; Wang et al., 2013). However, the results of observations and interviews at the Purworejo Vocational School stated that the OHS facilities at the time of the machining practice from the school already existed, but such as OHS signs, personal protective equipment and emergency numbers were incomplete. This is also supported by the explanation of students at SMK Negeri 1 Purworejo, he stated "PPE and signs there are only a few ohs at school and during practice we take turns using them because of limitations, sometimes we often neglect to use PPE and make mistakes in reading OHS signs. Then one of the Vocational School students at TKM Purworejo joined in voicing his opinion "the OHS equipment in our school already exists, but if in practice we take turns using it". This means that it can be said that OHS equipment or facilities in the Purworejo Vocational School machining workshop are still lacking. Other research mentioned shortages of personal protective equipment during practical's, and suggested that steps should be taken to increase the supply of these materials as they are very important in practical activities (Ishiwata et al., 2023; Metin et al., 2023; Valverde-Espinoza et al., 2023). This description is clarified by previous study which mention that occupational health and safety issues are not only related to people but also to the economics of institutions (Madlova & Gebhart, 2016), so that it can be concluded that the school economy is highly emphasized for the implementation of vocational student practices.

Lack of good views by students regarding the importance of OHS during practice is a bad thing. Based on the results of observations and interviews, there are still many students who think that there is nothing wrong with not implementing OHS, even though having such a perception can cause students to experience work-related illnesses and even serious injuries from practicing in a machining workshop (Madigan et al., 2019; Solahudin et al., 2016). Previous research state students' perceptions of the importance of OHS must be good, to avoid illness and injury as a result of carrying out practices while in the workshop and so that they become accustomed to using OHS when carrying out machining practices in the workshop (Adam et al., 2022). One teacher at the Vocational School TKM Purworejo and YPT Purworejo revealed during practice at the workshop students were sometimes still inconsistent in using personal protective equipment, they said they were a bit uncomfortable using it continuously. The teacher's response was also clarified by the opinions of students at the YPP Purworejo Vocational School. Findings of study revealed that the users of personal protective equipment know that the tools they wear during practice are very important, but they have different understandings about the risks in the safety culture so that they sometimes tend to use their own assumptions (Zimmerman et al., 2023). It can be concluded that students' awareness about OHS is still lacking. Other study suggest that to increase one's awareness about OHS one can use the role play method (Nilamsari et al., 2019), by using this method students experience an increase in OHS awareness with a score of 69.15% (very good criterion), although the results of this study are implied for elementary school students, this can be used as an option for vocational school teachers so that their students are aware of the importance of OHS.

Behavior is ethics, in the application of OHS there is ethics. For example, motivation is a drive from within and outside, motivation is the most powerful determinant of behavior. Discipline is obedience that arises because of awareness and encouragement from within (Hadadi et al., 2023; Legette et al., 2023; Murtagh & Frost, 2023). Honest is an attitude that states the truth is not lying. If this behavior is able to be possessed by students, then there will be a change in OHS behavior. This is also conveyed by research that revealed behavior can affect the application of OHS during machining practice in the workshop with a percentage value of 61% (Freitas & Silva, 2017; Madigan et al., 2020; Taviv & Wibowo, 2018). Suggestions from the author that vocational schools implement OHS to the fullest, can partner, or attend seminars held by the National Institute for Occupational Safety & Health (NIOHS) organization (SimanTov-Nachlieli & Moran, 2022; Wiese, 2023). NIOHS provides national and global leadership on preventing work-related illness, injury, disability and death by gathering information, conducting scientific research, and translating knowledge gained into products and services including training videos and recommendations to improve safety and health in the workplace (Qureshi & Ray, 2023; Rowen et al., 2022).

For the implementation of OHS it is not only the student's task but the responsibility of the teacher, school, colleagues, and parents must inform students to be careful in machining practices at school or remind them of the importance of OHS, and the government or agency must pay attention to several discussions that the authors have included, including 1) lack of complete knowledge about OSH, 2) lack of facilities from schools related to OSH, 3) poor student perceptions of the importance of OSH, 4) lack of student behavior (motivation, discipline, honesty). It has been proven that the implementation of OHS during machining practice in the workshops of vocational schools majoring in mechanical engineering in the Purworejo district is good, as can be seen from the results of observations, interviews, hypothesis testing, and influence analysis by cross-checking several teachers and vocational students in the machining engineering department of Purworejo district.

The benefits of the research include contributing knowledge to teachers and vocational students majoring in mechanical engineering, then reminding the vocational community about the importance of OHS before and after carrying out machining practices, then providing some of the drawbacks of applying OHS in the field of engineering at vocational schools in Purworejo district. So, it is recommended that all people involved must always improve and supervise and must quickly act if a work accident occurs while carrying out machining practices, if necessary, before and after carrying out the practice, they must be reminded again regarding these very crucial points because they relate to the future of Indonesia's young generation. However, the results of these findings are still temporary due to the development of science and technology and the limitations of the authors, including 1) the results of this study only discuss the application of OHS in learning machining practice, 2) data collection by students cannot be ascertained whether the participants these students actually work on these statements in earnest, 3) the limitations of the ability of researchers to conduct research (time and costs) so that researchers can only provide information related to the implementation of OHS in learning machining practices.

#### 4. CONCLUSION

This research proves that implementing occupational health and safety (OHS) on machining practical learning (MPL) is not only the task of the government, schools, and companies (stakeholders). However, it is the duty of everyone (awareness) and must also require relevant equipment to create health and safety at work wherever they are because health and safety is number one, by creating health and safety at work we will be able to realize the goals of vocational schools which are able to prepare students or competent graduates, work and even create jobs.

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