

## **Stake's Countenance Evaluation Method on Occupational Health and Safety Implementation in Electronics Engineering Education's Student Industrial Internship**

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### **ABSTRACT**

This paper discusses the evaluation of the implementation of Occupational Health and Safety (OHS) in student industrial internships. Due to the possibility of the risk of work accidents on industrial internship students are prone to occur. Currently, there are still few who discuss the evaluation of OHS implementation as the basis for carrying out sustainable action efforts. Based on the evaluation carried out, the OHS Implementation in Electronics Engineering Education's Student Industrial Internship has been feasible and follows applicable laws and regulations. The results of this evaluation can provide ideas for increasing sustainable action efforts regarding OHS in Student Industrial Internships.

**Keywords:** occupational health and safety, evaluation, stake's countenance model

### **INTRODUCTION**

Methods, analysis, and evaluation of the implementation of Occupational Health and Safety (OHS) in the industry are important to be applied [1]–[3]. This is in line with the basic principle of OHS that every employee (workers and prospective workers) must have a collaborative safety perspective between humans, machines, and the environment as a comprehensive safety management system in certain work situations. On the other hand, the rapid development of technology will be directly proportional to the occurrence of work accidents. Thus, OHS is a mandatory requirement in trade in services and goods between countries around the world. Employers also have a business and moral obligation to ensure that potential work-related risks are identified, evaluated, controlled and where possible eliminated.

Not only for employees, the understanding and implementation of OHS are also applied to students even before they enter the world of work through student industrial internships in the industry. The industrial internship is an effort to harmonize the world of

education with the world of work. This Industrial internship is given to students to gain experience, ability, and a good attitude while studying in the industry. OHS referred to here is all activities to ensure and protect the safety and health of workers through the prevention of work accidents and occupational diseases. However, the risk of work accidents in industrial internship students is prone to occur which requires further analysis [4].

To reduce or eliminate hazards that can cause accidents in industrial internship students, a risk management activity is needed, including hazard identification, hazard analysis, risk assessment, risk control, and monitoring and evaluation. Risk identification is carried out to find out the activities that are the source of the risk and their impact on the occurrence of work accidents. In the process of identifying and analyzing potential hazards, the Hazard Analysis method can be used [5].

To minimize the risk of work accidents and determine the effectiveness of the OHS, it is necessary to evaluate the implementation of OHS in student industrial internships using the Stake's Countenance Model. [6], [7]. Evaluation

or assessment carried out on the implementation of OHS includes planning, implementation, and evaluation using survey techniques.

Several OHS analysis studies have discussed possible to keep track of underground mine individuals and their health parameters [8], IoT for construction sites workers monitoring [9]–[11], oil and gas energy utility company [12], risk estimation using deep learning in shipbuilding industry [13], ergonomic molding tool in beverage industry [14], and macro-ergonomic approach in school [15]. However, currently, there are still few who discuss the evaluation of OHS implementation in industrial internship students.

Based on the proposed evaluation, this paper discusses that Occupational Health and Safety (OHS) Implementation in Electronics Engineering Education's Student Industrial Internship is feasible and follows applicable legislation. Finally, preventive measures and suggestions are proposed, based on the implementation of OHS on Student Industrial Internship. The results of this evaluation can provide ideas for increasing sustainable action efforts regarding OHS in Student Industrial Internships.

**METHODS**

The evaluation method on the implementation of Occupational Health and Safety (OHS) is used as the basis for policies or regulations that will be taken in the company regarding the safety of its employees. This study uses three evaluation steps, namely output, transcription or process, antecedents or input as a means to obtain data which is then analyzed and as a reference in making a decision using qualitative data and quantitative data.

In the Stake's Countenance Model, the evaluator must examine a program based on the output, process, and input to a system. In making the consideration of the study material, the matrix is shown in Figure 1. This matrix is

used to indicate a target position at the evaluation stage which will be analyzed according to the data that has been obtained through several processes.

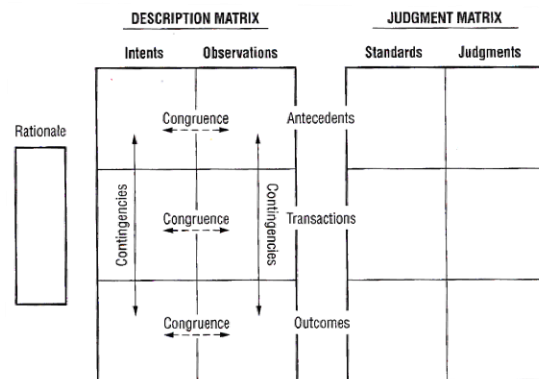


Figure 1. Stake's Countenance Framework.

Then the method of data collection by way of observation is one of the good methods in analysis. The observations were carried out online using Google Forms to related parties such as internship students and their supervisors. The form of the instrument used in this study is an instrument that uses a type of data that can be disclosed, namely in the form of an observation sheet. The appropriate answer will be marked with a checklist.

Quantitative data analysis uses statistics to describe the object under study through tables or data. Calculation of central symptoms or called Central Tendency is used in this analysis technique. Mean (M), Standard Deviation (SD), Mode (Mo), median (Me). The position determination formula is included with the calculation of the ideal standard deviation and the ideal mean and is calculated by the following equation:

$$Mi = \frac{1}{2}(ST + SR) \tag{1}$$

$$Sdi = \frac{1}{6}(ST - SR) \tag{2}$$

Where ST is the highest ideal score, SR is the lowest ideal score, Mi is the ideal mean, and Sdi is the ideal standard deviation.

The lowest score (SR) and the highest score (ST) were obtained from the Likert assessment (score range 1-4). The lowest score of 1 and 4 is the highest score after which it is

multiplied by the number of statements. The results of the Sdi and Mi calculations can be categorized on each ability variable. These calculations can be seen in Table 1.

Table 1. Category Likert Scale and Score Range

Category	Score Range
$(Mi+1,5SDi) < X \leq (Mi+3SDi)$	Very compliant
$(Mi+0SDi) < X \leq (Mi+1,5SDi)$	Compliant
$(Mi-1,5SDi) < X \leq (Mi-0SDi)$	Less compliant
$(Mi-3SDi) < X \leq (Mi-1,5SDi)$	Incompliant

Qualitative data analysis using observation documentation was found by Huberman and Miles. This technique is an interactive analysis focused on research indicators.

## RESULT AND DISCUSSION

The steps in the Stake's Countenance Model that have been described are used to find out how to evaluate the implementation of OHS in the implementation of student industrial practices. Statements have been distributed to 115 respondents, with details of field supervisors 25 respondents and students 90 respondents.

### A. Data Antecedents

The main indicator is that in policymaking and planning, OHS has four sub-indicators, namely resources and responsibilities, supervision, disaster preparedness, and communication and participation with students. There are statement items for field supervisors totaling 15 items and for students totaling 10 items. Indicator assessment based on Table 1 calculations can be described in Table 3.

Based on Table 2, the determination of the OHS Management System filled by 5 field supervisors can be categorized as "very compliant". Questionnaire statements that have been filled out by 23 students can be categorized as "very compliant". This

distribution table will be used for other indicators.

Table 2. Indicator Distribution

Category	Supervisor		Student	
	freq.	%	freq.	%
Very compliant	5	20	23	20
Compliant	10	40	52	45,3
Less compliant	10	40	40	34,7
Incompliant	0	0	0	0

Based on the OHS planning and policy scores, it is known that the steps for determining the OHS Management System are in the "compliant" category. The field supervisor showed an average score of 31.2, the OHS management system steps obtained the "very compliant" category and for students, the average score was 29.49 in Table 2.

Table 3. OHS Management System Policy Criteria

Score Range		Category
Supervisor	Student	
$44,5 < X \leq 55$	$31 < X \leq 38$	Very compliant
$33,5 < X \leq 44,5$	$26,3 < X \leq 31$	Compliant
$23,1 < X \leq 33,5$	$16,1 < X \leq 26,3$	Less compliant
$14 < X \leq 23,1$	$8 < X \leq 16,1$	Incompliant

Indicator Communication goes well utilizing 2 communication models that can be implemented indirectly and directly. Directly by being implemented every day before work with a safety meeting and indirectly by putting up OHS posters in every room.

For indicators of resources and responsibilities, each division head has received OHS training certificates held by training institutions. In the supervision sub-indicator, all employees and work infrastructure are equipped with a previously verified Standard Operating Procedure (SOP). In the disaster preparedness sub, each room has an evacuation map to the

gathering point, the walls of the building also have directions to the evacuation point of the gathering point. On the stairs are also given instructions with a sticker that is under the standard.

Tabel 4. OHS Planning and Policy Score

Respondent	ST	SR	Mean	Mo	Me	Sdi
Supervisor	53	15	33,3	35	31,2	7,3
Student	37	10	30,1	31	32	6,7

The OHS application step in the field has four sub-indicators, namely the work environment, first aid, goals and programs, and documentation. Questionnaire items given to field supervisors are 16 items and 17 items for students. The criteria for assessing OHS implementation indicators are described in Table 5.

Table 5. OHS Implementation Indicator Criteria

Score Range		Category
Supervisor	Student	
$45 < X \leq 55$	$46 < X \leq 66$	Very compliant
$31 < X \leq 41$	$37 < X \leq 46$	Compliant
$26 < X \leq 33$	$25 < X \leq 37$	Less compliant
$15 < X \leq 25$	$15 < X \leq 25$	Incompliant

Based on the analysis from Table 6, it can be concluded that the implementation of OHS obtained the appropriate category for the field supervisor which was shown at a value of 35.3, the steps for implementing OHS were in the "very compliant" category and the mean obtained by students was 31.1.

The steps for implementing OHS are very organized and well-administered, this is evidenced that all files are in their place and easy to retrieve. If there is a sudden inspection, it will be very fast in documenting it. This is a major advantage for companies where students seek knowledge.

Table 6. OHS Implementation Score

Respondent	ST	SR	Mean	Mo	Me	Sdi
Supervisor	52	11	35,3	37	33,2	6,3
Student	33	10	31,1	31	33	8,7

#### B. Data Transaction

The OHS plan has hazard identification. The total number of questionnaires intended for field supervisors is 11 items and for students is 7 items.

Table 7. OHS Planning Criteria

Score Range		Category
Supervisor	Student	
$35 < X \leq 43$	$31 < X \leq 35$	Very compliant
$30 < X \leq 35$	$25 < X \leq 31$	Compliant
$23 < X \leq 30$	$23 < X \leq 25$	Less compliant
$13 < X \leq 23$	$15 < X \leq 23$	Incompliant

In the OHS implementation step, it is known that planning and hazard identification are based on the data obtained that all companies have tried to take steps to optimize activities based on legislation. Judging from the data obtained, identification activities are orderly in their implementation. Everything is carried out procedurally and well archived.

Table 8. OHS Planning Score

Respondent	ST	SR	Mean	Mo	Me	Sdi
Supervisor	15	11	35,3	37	33,2	6,3
Student	17	10	31,1	31	33	8,7

There are four steps for implementing OHS, namely supervision, resources, and responsibilities, as well as disaster preparedness, communication, and participation with students. The total number of questionnaires intended for field supervisors is 20 items and 15 items for students. The assessment criteria are in Table 9.

Table 9. OHS Implementation Criteria

Score Range		Category
Supervisor	Student	
$32 < X \leq 41$	$31 < X \leq 40$	Very compliant
$27 < X \leq 32$	$25 < X \leq 31$	Compliant
$23 < X \leq 27$	$23 < X \leq 25$	Less compliant
$15 < X \leq 23$	$15 < X \leq 23$	Incompliant

Based on Table 10, in its implementation, OHS obtained the "very compliant" category, based on the field supervisor it showed a mean value of 46. In the K3 implementation step, the category "very compliant" was obtained, and based on students showing a mean of 49.

Table 10. OHS Implementation Score

Respondent	ST	SR	Mean	Mo	Me	Sdi
Supervisor	71	15	46	32	47	6.5
Student	65	15	49	50	47	7

### C. Data Output

There are four OHS monitoring and evaluation steps, namely health monitoring, maintenance and repair of facilities, reporting and recording of work, and evaluation of OHS policies. This step is based on all data obtained from the evaluation and monitoring results that have been applied to each company. The statement given to the field supervisor is 15 points and 7 points for students.

Table 11. OHS Performance Evaluation Criteria and Monitoring

Score Range		Category
Supervisor	Student	
$41 < X \leq 51$	$17 < X \leq 21$	Very compliant
$33 < X \leq 41$	$13 < X \leq 17$	Compliant
$27 < X \leq 33$	$9 < X \leq 13$	Less compliant
$16 < X \leq 27$	$5 < X \leq 9$	Incompliant

Based on the results of the analysis in Table 12, it is known that in the implementation of OHS, the category of "very compliant" was obtained. Field supervisors obtained a mean of

41. The steps for implementing OHS were obtained in the "very compliant" category which according to students could be presented with a mean of 45.

All steps in the procedure have been implemented such as monitoring and hazard identification and maintenance and repair of existing facilities and infrastructure. OHS monitoring and evaluation has been going well and can be legally accounted for in the legislation.

Table 12. OHS Performance Monitoring and Evaluation Score

Respondent	ST	SR	Mean	Mo	Me	Sdi
Supervisor	71	15	41	32	47	6.5
Student	65	15	45	50	47	7

### D. Factors Affecting OHS in the Implementation of Student Industrial Internship

Based on the results of data collection and analysis, 2 main factors influence the process of implementing OHS in the company. These factors are inhibiting factors and supporting factors. The inhibiting factor is obtained from human resources in the company, the workers still lack full awareness to wear and use personal protective equipment properly and correctly. Therefore, the assessment on this basis can be said to be still inadequate.

The supporting factors in the implementation of OHS are based on the existence and even completeness of the organizational structure and procedural implementation that is very well organized and good. Administration and documentation are very good, so it is very supportive in the event of a sudden inspection of the relevant agencies who are very focused on the OHS management system documents which are regularly available.

## CONCLUSION

Evaluation of OHS implementation in Electronics Engineering Education's Student Industrial Internship which consists of antecedents, transactions, and outputs has been carried out. The antecedents step, which consists of the steps of determining policies and planning and implementing OHS, has been carried out well so that all aspects of these steps are fulfilled. The transaction step, which consists of planning and implementing OHS, has met the requirements and has even been implemented under the OHS management system steps following applicable laws and regulations. In the output step which consists of monitoring and reviewing it is carried out well but there is still one category that gets a score that is not appropriate according to the OHS management system which is in the review step.

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