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Developing a Safety Climate Measurement at the Malaysian Public Universities Work Setting

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***ABSTRACT**--Safety climate is the objective measurement of attitudes and perceptions toward Occupational Safety & Health (OSH) issues but it has been ignored for some time. In Malaysia, safety climate implementation on the legislation concerning workplace safety is already in place. This paper is focusing on the issues of safety climate measurement at the universities' work setting. The respondents are the staff from public universities in Malaysia that are randomly selected to support the study and staff's opinion on developing a safety climate measurement at the workplace. This study uses a quantitative method by using the survey questionnaire. There was 9 dimension of safety climate measurement and the dominant dimension of safety climate measurement was personal priorities and need for safety. The objectives of this research were successfully obtained through the method of distribution of questionnaires. The findings of this research have shown that the dominant dimension of safety climate measurement is personal priorities and the need for safety which shows the highest mean score. This study provides more understanding about the safety climate measurement at the universities' work setting.*

***Keywords**-- Safety climate; safety performance; Safety Climate Assessment Toolkit*

I. INTRODUCTION

Safety climate can be defined as employees' shared ideas about the significant importance of safety in their organization. It is also can be referred to as the employees' trust in the real priorities of the safety performance of the organization (Cooper & Phillips, 2004). The previous study has found out that the organization with a strong awareness of safety climate could have fewer numbers of accidents occur and staff injuries because the workplace has well developed and effective safety programs (Gutiérrez *et al.,* 2013). Indeed, it is likely to have a link to working behaviors when it comes to the safety climate. This paper aims to gain a deeper understanding of safety climate work setting performance at one of the public universities in Malaysia.

In Malaysia, safety concern is still considered as poor although legislation concerning workplace safety is already in place (Rampal, 2000). The purpose of the safety climate is about promoting culture in order to avoid an accident and reduce the injuries at the workplace (Kogilavani, 2013). The important factors that affect safety and at the same time create a positive climate are through the implementation of continuous improvement (Wu *et al.*, 2007). The occupational safety officers must take into consideration every staff and their duties in the organization. Here, the safety climate can forecast staff behavior about safety and reduce injuries (Widyantia *et al.,* 2008).

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Safety climate has more passive connotations of being influenced by the external environment. An organization can build a good safety climate, and by creating a positive safety culture to showing excellent safety performance. Hence, the objective, which is to reduce occupational hazards can be achieved. On the other hand, universities are special workplaces because of the potential risk to a wide range of agents as both acute and chronic risks (Gutiérrez *et al.,* 2013). Experimental laboratories, a testing ground, or in the university practice facility where the stage for students to learn skills and scientific theory. University laboratories tend to have safety hazards such as biological, chemical, explosive and flammable.

1.2 Problem statement

A positive safety climate may improve organizational safety performance (Kelly *et al.,* 2011) and it has a direct impact on the behavior of employees in order to reduce the accident rates at the workplace. The employees need to have a piece of strong knowledge about safety awareness in order to reduce the risk of accidents in the organization (Wahab *et al.,* 2013; Nevhage & Lindahl, 2008). Improving safety performance is critical in order to university management. Increased security performance in the university work setting can increase resistance or durability and reduce the risk of accidents. However, poor security performance can increase organizational vulnerability and thus increase the risk of accidents (Nevhage & Lindahl, 2008). Generally, accidents at work occur due to lack of (1) knowledge, (2) supervision, (3) judgmental error, (4) negligence, and (5) reckless actions (Cox & Cheyne, 2000). Therefore, Safety Climate Assessment Toolkit is an important tool to measure perceptions of employees about safety in their organization (Cox & Cheyne, 2000). The toolkit seeks to develop a variety of methods to get and provide a more complete understanding (Srinivasan, 2012). The toolkit has 9 dimensions for the survey which include management commitment, communication, the priority of safety, safety rules and procedures, supportive environment, involvement, personal priorities and need for safety, personal appreciation of risk, and work environment (Cox & Cheyne, 2000). Based on the above statement, the purpose of this study is to investigate the safety of climate measurement and safety performance in the Malaysian public universities' work setting.

II. LITERATURE REVIEW

Safety climate can be defined as a process where the employees shared their opinions about the importance of safety to their work setting (Wills *et al.,* 2005). On the other hand, the safety climate also can be summarised as a perception of employees on the importance of sharing their concerns on safety in their work setting (Wu *et al.,* 2007). And the perception of employees influences on their work behavior. Safety climate can forecast employees' behavior to reduce accidents (Widyantia *et al.,* 2008) and at the same time can be used as a way of measuring the safety performance of the organization (Wills *et al.,* 2005). Meanwhile, Safety performance can be explained as the quality of safety in the work setting (Nevhage & Lindahl, 2008). Safety performance is the total performance of the workplace. The higher the safety performance, the lower the risk of accidents. Safety performance may include safety organization and management, safety equipment and measures, accident statistics, accident investigations and evaluation, safety training, and safety training practice (Nevhage & Lindahl, 2008). The organization should improve safety performance through different methods. Accordingly, there are many

studies have been done about the importance of safety climate in the workplace (Nor Azimah *et al.,* 2009). Here, a good safety climate implementation can reduce the number of accidents (Nor Azimah *et al.,* 2009). On the other hand, the organizations may apply the safety climate to assess their safety performance.

Based on the literature review conducted, the authors have identified the safety climate focuses on two, namely organizational security performance and individual safety performance. Therefore, it is important to have a good safety climate measurement (Bergh, 2011). With safety climate measurement, the university might able to reduce accident rates, reduced costs and finally increased productivity. On the other hand, the employees feel that the organizations put serious effort to avoid the accident happened in universities (Wu *et al.,* 2007).

2.1 The Impact of Safety Performance

The safety performance is evaluated by accident rates which also influenced the job performance (Neal *et al.,* 2000). The safety performance has two types which are compliance and participation. Safety compliance relates to safety procedures and works with safe. Safety participation is to help colleagues, promoting the safety program, showing initiative and putting effort in to improve safety in the workplace. There are three components of safety performance which are knowledge, skill and motivation (Neal *et al.,* 2000). Knowledge, skill and motivation have different effects on the different components of safety performance. Employees must understand how to work safely and have the skill to be able to do it in order to comply with safety procedures. The safety climate assessment toolkit is a tool to analyze employee perceptions about the safety climate in the organization. It also set as the benchmark for the organization's safety climate to improve its safety management system (Muhamad Firdauz, 2009). The tool is a technique for monitoring the safety climate measures. There are two options to use safety climate measurement which are developing a new measurement tool or adapting an existing measurement tool (Nor Azimah *et al.,* 2013). Adapting an existing measurement tool is a better option because developing a new measurement tool needs a lot of resources.

III. METHODOLOGY/MATERIALS

In this research, the quantitative method was applied for the purpose of data collection. Researchers usually choose the quantitative approach to respond to research questions requiring numerical data, the qualitative approach for research questions requiring textural data, and the mixed methods approach for research questions requiring both numerical and textual data (Williams, 2011). Quantitative methods can be used in response to the relationship between the variables of questions (Williams, 2011). Quantitative methods are used to identify independent variables and dependent variables of research. Quantitative methods are also described as deductive in nature, in the sense that inferences from tests of statistical hypotheses lead to general inferences about characteristics of a population (Harwell, 2011). Here, these research methods are characterized by the collection of information that can be analyzed numerically, the results of which are typically presented using statistics, tables and graphs. Information is gathered through instruments such as tests and surveys to analyze the statistical hypothesis.

A population is a larger collection of units from which a sample is taken. The study used random sampling to ensure there is no bias in the selection of the sampling. Respondents have involved the staff as the population in

research. Selection is based on the scope to support the research and staff's opinion on the safety climate measurement at work sets are collected. This study is conducted by using the method of survey. The questionnaires were distributed to the respondents at one of the public universities in Malaysia. The questionnaires were analyzed by using Statistical Package for Science Social (SPSS).

A total of 30 respondents was selected to conduct a pilot study. Cronbach's Alpha value for the pilot study is 0.962. The level of reliability was higher than 0.7 means the data collected in the pilot study had high reliability. The population of the study was 2245 which includes both academic and non-academic staff. According to Krejcie and Morgan (1970), the population's sample size of 2400 should be 331. A total of 331 questionnaires were distributed to the selected respondents but only 198 questionnaires were collected back with the rate of return was 59.82 percent.

IV. RESULTS AND FINDINGS

4.1Management Commitment

Table 1 shows the descriptive analysis of management commitment with the average mean of 3.61 and a standard deviation of 0.76.

Table 1: Descriptive Analysis of Safety Climate

Statement	Disagree	Neutral	Agree	Mean	Standard Deviation
Management Commitment					
The management take corrective action.	14 (7.07%)	65 (32.83%)	119 (60.11%)	3.61	0.77
The management quickly correct safety problems.	32 (16.16%)	66 (33.33%)	100 (50.51%)	3.39	0.88
The management concern about the safety.	17 (8.59%)	49 (24.75%)	132 (66.67%)	3.69	0.80
The management concern about safety rules and procedures.	12 (6.07%)	50 (25.25%)	136 (68.69%)	3.76	0.78
			Average	**3.61**	**0.70**
Communication					
The management informs about the safety problem at the workplace.	30 (15.16%)	63 (31.82%)	105 (53.03%)	3.43	0.87

Statement	Disagree	Neutral	Agree	Mean	Standard Deviation
Good communication about safety problems at the workplace is important.	13 (6.57%)	26 (13.13%)	159 (80.30%)	4.01	0.85
The employees receive praise for working safely.	40 (20.20%)	69 (34.85%)	89 (44.95%)	3.28	0.89
The supervisor promotes safety info at the workplace.	28 (14.15%)	69 (34.85%)	101 (51.01%)	3.40	0.83
The management operates an open door policy on safety issues.	21 (10.61%)	56 (28.28%)	121 (61.12%)	3.54	0.81
			Average	**3.53**	**0.65**
Priority of Safety					
Employees safety are the most important aspects of my workplace.	11 (5.56%)	36 (18.18%)	151 (76.26%)	3.98	0.86
The management considers safety problems as a priority.	17 (8.68%)	51 (25.76%)	130 (65.66%)	3.68	0.82
The management considers safety as equally important.	17 (8.68%)	50 (25.25%)	131 (66.16%)	3.68	0.81
			Average	**3.78**	**0.73**
Safety Rules and Procedures					
Safety rules and procedures at the workplace are really practical.	17 (8.59%)	54 (27.27%)	127 (64.15%)	3.64	0.80
Safety rules and procedures need to be followed at the workplace.	8 (4.04%)	30 (15.15%)	160 (80.81%)	4.05	0.81
	6	27	165	4.07	0.76

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Statement	Disagree	Neutral	Agree	Mean	Standard Deviation
Safety rules and procedures are helpful for employees.	(3.03%)	(13.64%)	(83.34%)		
Safety rules and procedures are available at my workplace.	17 (8.59%)	41 (20.71%)	140 (70.71%)	3.75	0.83
			Average	**3.88**	**0.67**
Supportive Environment					
Safety of employees will be affected by the environment.	5 (2.53%)	28 (14.14%)	165 (83.33%)	4.03	0.73
Employees are encouraged too concerned about safety problems at the workplace.	11 (5.56%)	36 (18.18%)	151 (76.26%)	3.87	0.81
Employees are encouraged to reported safety problems to the management.	10 (5.05%)	35 (17.68%)	153 (77.28%)	3.89	0.77
Employees often share safety tips with each other.	20 (10.10%)	63 (31.82%)	115 (58.08%)	3.59	0.88
			Average	3.84	0.63
Involvement					
All level of employees involved in safety at the workplace.	21 (10.61%)	44 (22.22%)	133 (67.17%)	3.72	0.91
Employees involved in the activity review of safety problems.	28 (14.15%)	59 (29.80%)	111 (56.06%)	3.51	0.90
	20	54	124	3.64	0.94

Statement	Disagree	Neutral	Agree	Mean	Standard Deviation
The top management involved in developing the safety policy.	(10.11%)	(27.27%)	(62.62%)		
			Average	**3.62**	**0.81**
Personal Priorities and Need for Safety					
The safety problems are the most important aspect of work.	9 (4.55%)	27 (13.64%)	162 (81.82%)	4.04	0.81
All level of employees understands the safety rules of work.	20 (10.10%)	61 (30.81%)	117 (59.09%)	3.60	0.85
A safe workplace has a lot of personal meaning to employees.	10 (5.05%)	35 (17.68%)	153 (77.27%)	3.97	0.83
Safety problems is the priority when completing a job.	13 (6.57%)	28 (14.14%)	157 (79.30%)	3.95	0.83
			Average	**3.89**	**0.67**
Personal Appreciation of Risk					
Employees are worried about being injured at the workplace.	9 (4.55%)	36 (18.18%)	153 (77.27%)	3.98	0.86
The probability involved in the accident at the workplace is low.	37 (18.69%)	42 (21.21%)	119 (60.11%)	3.49	0.95
All employees clear about the responsibility.	21 (10.61%)	58 (29.29%)	119 (60.10%)	3.60	0.83
			Average	**3.69**	**0.65**
Work Environment					
Employees can get safety equipment in the workplace.	26 (13.13%)	46 (23.23%)	126 (63.64%)	3.57	0.87

Statement	Disagree	Neutral	Agree	Mean	Standard Deviation
Work environment now are more safe.	20 (10.10%)	58 (29.29%)	120 (60.61%)	3.55	0.82
Employees are given enough time to complete the work with safety.	20 (10.10%)	60 (30.30%)	118 (59.60%)	3.50	0.84
There are always enough people available to complete the work with safety.	26 (13.14%)	64 (32.32%)	108 (54.54%)	3.44	0.85
			Average	**3.52**	**0.76**

Source: Author

The table above shows the descriptive analysis for 9 dimensions of safety climate measurement. From the value of the mean, the dimension of safety climate measurement can be ranked according to the highest value to the lowest value. The highest mean is 3.89 which personal priorities and need for safety. Next, the ranking of dimension followed by safety rules and procedures (3.88), supportive environment (3.84), the priority of safety (3.80), personal appreciation of risk (3.69), management commitment (3.61), involvement (3.62) and communication (3.53). Lastly, the lowest mean is 3.52 which work environment. Therefore, the dominant dimension of safety climate measurement is personal priorities and the need for safety.

In this research, the dominant dimension of safety climate measurement is personal priorities and the need for safety. Personal priorities and the need for safety are an individual appreciation of employees. The view of employees cares about their own health and safety management, and they need to feel safe at the workplace (LaTourrette *et al.*, 2008). The employees feel the most important aspect of work is safety problems. At the same time, safety problems are a priority when employees completing a job. Besides, a safe workplace has a lot of personal meaning to the employees. Employees can feel safe and allow to complete more work (LaTourrette *et al.*, 2008). All levels of employees also must understand the safety rules of work.

Safety is the responsibility of all employees and not only the responsibility of management. Employees are more focused on personal priorities and the need for safety at work setting. They want to have a safe working setting. For the management of Malaysian Public Universities, it is recommended that they should be responsible for the safety of employees. However, all level of employees also should understand their role in the safety and participate in activity safety improvement. Furthermore, it is recommended that the management can learn about how to effectively manage the safety of employees in safety processes. If the management gets effective methods to manage the safety of employees and then it is more easily achieve a good safety performance result. In addition,

it is also recommended that the management always remind employees of their role in the safety and keep them on track.

For future research, the recommendations include expanding the scope of the research to other Malaysian Public Universities to allow more data collection so that it can be more representative of the population and more accurate. Furthermore, it is recommended that future researchers utilize other research methods to study the relationship between the dimensions for safety climate measurement at the Malaysian Public University work setting. It is also recommended that future researchers through a combination of research methods such as quantitative research methods and qualitative research methods for data collection which may allow more accurate identification of the dominant dimension for safety climate measurement at the Malaysian Public University work setting. The combination of research methods may be useful in given that extra important information in research objectives, research findings and discussion.

V. CONCLUSION

As a conclusion, the objectives of this research were successfully obtained through the method of distribution of questionnaires. This research was done to identify the dimension for safety climate measurement at the Malaysian Public University work setting and to identify the dominant dimension of safety climate measurement at the Malaysian Public Universities work setting. The findings of this research have shown that the dominant dimension of safety climate measurement is personal priorities and the need for safety which shows the highest mean score.

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