SAFETY INITIATIVE: DIMENSIONS DEVELOPMENT

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ABSTRACT

The purpose of this study is to develop the dimensions of safety initiative for accomplishing the job. Based on the previous studies, safety initiatives items of instrument are gathered and analysed. A total of 17 items out of 46 suitable items have been shortlisted and have passed the expertise of experts in occupational safety and health. Using guided questionnaires, the study involved 745 Malaysian paddy farmers from different agencies. Paddy farmers are constantly exposed to various types of hazards during performing jobs at fieldwork. Based on the Occupational Safety Social Security Act 1969, paddy farmers are classified as self-employed and are only registered with the Department of Agriculture to obtain subsidies provided by the Government. Factor analysis of survey results reveal that there are two factors that explain the underlying dimensions of safety initiative which reflect employees' attitude and behaviour towards safety at workplace. These two factors are named as safety responsibility and safety alert.

Keyword: Safety Initiative, Safety Responsibility, Safety Alert.

INTRODUCTION

Safety initiatives refer to a situation or an employee's condition to not just simply work in a standard safety environment but are also contributing ideas and are proactive in increasing the standard of safety in their work environment (Zacharatos, 2002.). According to various authors (Marchand et al., 1998; Neal & Griffin, 2006), safety initiatives refers to an employee's personal oriented traits towards shaping the future and a safe work environment. Initiative oriented actions are seen as how far an employee would act to support the continuos process of change in the work environment to enhance safety while working (Boerner & Dutschke, 2008).

According to Simard & Marchard (1995), safety initiatives are important variables to predict safety achievements. Many previous researchers define safety initiatives as a measure of safe behaviour like (Andriessen, 1978; Kark et al., 2015; Marchand et al., 1998; Salleh, 2010; Zacharatos, 2002). However, many research instruments used in safety inititatve researches are found to be inconsistent. For instance, past researchers used instruments like safety participation and safety citizenship behaviour to measure safety initiatives. This is because, they assume that the role of safety initiatives is similar to that of safety participation and safety citizenship behaviour to measure the safety behaviour at a work place. Hence, the dimensions or factors defining safety initiatives need to be studied in depth.

The number of items and the relationship between the items and instruments used by previous researchers are varied and overlap in the meanings in addition to it is not standardised. That is why, Marchard et al., (1998) had suggested that a valid instrument should be developed to measure safety initiatives in different sectors and industries. Thus, the objectives of this

research is to develop a safety initiative instrument and dimensions so that it is more consistent and has standardized items suitable for a safety inititative research.

LITERATURE REVIEW

Liping & Yun (2015) applied behavioural safety initiative as the medium between individual initiative and safety management results in their research. They used the safety citizenship behavior instrument containing 27 items to measure the safety initiatives based on the observation by Hofmann et al. (2003). Liping & Yun (2015) classified safety initiatives into six sub-dimensions actions to develop safety behavior which are i) assist (work colleagues to fulfill their safety responsibility), ii) monitor (protect work colleagues from risk and danger), iii) start the change (take action to increase safety), iv) voice (encourage safe activities), v) civic duty (involved in non mandatory organizational activities like programs and safety meetings), vi) disclose information (report those who break safety procedure).

Research by Zacharatos et al. (2005) on 196 personnel in the petroleum and telecommunication industry used safety initiatives as one of the elements to measure individual safety orientation. The measure was carried out to show real life situations of employees' safety and individual safety achievements. In the research, Zacharatos et al. (2005) used 4 items in the instrument of safety participation to measure safety initiatives. This same item was also used by Kark et al. (2015) in the research pertaining to the influence of leadership towards employees' safe behaviour.

At the same time, researchers like Neal et al. (2000); Zacharatos (2002); Salleh, A. (2010) had used items developed by Turner & Parker (2000) to measure safety participation. This measure involves eight items to measure safety initiatives. On the other hand, Boerner and Dutschke (2008) had used the Organisation Citizenship Behaviour (OCB) instrument to study safety initiatives in hospitals. This instrument has 4 items to see how far an employee would be involved in behaviours supporting the constant changing process to increase safety.

Marchard et al. (1998) had presented seven items to measure safety initiatives to verify the research carried out by Andriessen (1978); Simard & Marchard (1994). The items used involved the tendency of an employee, providing suggestions to increase safety at the work place, refusal to carry out dangerous works, to gather information about risks of dangerious works, pressuring the management to increase the safety aspect and involvement in safety meetings at the work place.

Conceptual Framework

This research framework is developed based on the Theory Planned Behaviour (TPB). This framework is illustrated in Figure 1 below.

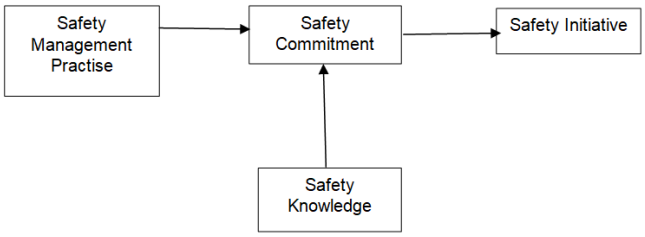

FIGURE 1
CONCEPTUAL FRAMEWORK

METHODOLOGY

A total of 46 items from previous studies were gathered and analyzed for safety initiatives instrument improvement. The testing process was done based on the source instruments used by past researchers, and these items were sent to the interpreters at the Malacca High Court to be translated into Bahasa Melayu. This process is necessary because the items obtained from a different language should go through the translation process in an effort to reduce any variance caused by the difference in culture and linguistics (Yu et al., 2004).

After details discussion with reseachers in the occupational safety and health, the 46 items were shortlisted to 32 items. Based on the feedback and comments, the errors were identified as; i) an overlap of items defining the same things, ii) the language selection or terminologies and words should be suitable to the demographic of the respondents of the research, iii) all items of the questionnaire should be positively written as the respondents are of low academic abilities and iv) there are words and sentences that can confuse the respondents. This is done to ensure that the language selection, language style, terminologies and words used are suited to the demographic of the respondents. According to Folz (1996), the item used in and instrument should satisfy the criteria of clarity, logic, adaptability, precision and consistency. The item should also be easily understood and related to the questions in line with the objectives of a research (Casley & Kumar, 1988).

Then all 32 items was sent to four occupational safety and health experts from industry and academician. After taking into consideration the opinions and suggestions presented by the experts, corrections and modifications were made. Based on the 32 items examined, only 17 were acceptable for dimensions development. Next, a pilot study was carried out to determine if the instruments used were valid or not (Nunnally, 1978). Other than that, a pilot study was also carried out to ensure the questionnaire was easily understood and reliable in collecting the research data. For this purpose, a total of 70 sets of questionnaires were distributed to the respondents. Based on the value of the coefficient, Cronbach Alpha as the reliability coefficient, it can state how the items being tested can develop a positive relationship between one another (Bryman & Cramer, 1990; Cavana et al., 2001). The analysis found that the value of Cronbach Alpha for all 17 items of the instrument for safety initiatives were 0.824. This result shows that the reliability value is very high and was acceptable.

DATA ANALYSIS

A total of 745 completed questionnaires from respondents were subjected to Social Science Statistik Package version 20 (SPPS) analysis. All the 17 items in the instrument of safety initiatives are subject to the Principal Component Analysis tested in three steps. The first step is related to determining the value of suitability of data analysis factors involving examining the correlation matrix value with the correlation value over 0.3, Keiser-Meyer–Olkin (KMO) value more than the minimum value of 0.63 and the Bartlett test to achieve the statistic signifying the value of $p<0.05$. The second step is related to determining the number of factors that can be kept depending on the Eigen value. The Eigen value that shows the value one or more will be kept for further analysis. However, this technique does have its flaw, whereby it keeps too many factors (Pallant, 2007). This weakness can be overcome using the scree technique by Catell (1966) to determine the number of factors by setting the curve until it changes horizontally like an elbow curve. The factors located on top of the elbow is kept as highest contributing factors to the variance in the set of data. Lastly, parallel analysis Monte Carlo will be used to determine the

number of factors. Table 1 shows a summary of determinant of data analysis factor for the safety initiative item. The KMO test gives a value of 0.9 which is more than the minimum value of 0.6, the strength of the correlation between the items are more than 0.3 and can be accepted while the Bartlett's test found the value of P<0.05 where P=0.00. Therefore, this data is suitable to be further analysed to determine the number of factors in the safety initiative instrument.

Table 1
SUMMARY OF FACTOR ANALYSIS (PRINCIPAL COMPONENT ANALYSIS) FOR SAFETY INITIATIVE

Item		Results	Description
1	**Matrix Correlation** Kaiser-Meyer-Olkin Measure of Sample Ability (KMO)	 0.900	
2	**Bartlett's Test** *Approx. Chi-Square* df Significant	 4723.200 136 < 0.000	Statistic testing for correlation between variables
3	**Early Eigen Value** Number of Factors Number of Variants Shown	 4 59.24 %	More than 1 and can be accepted under the Eigen value Rule
4	**Rotational Factor** Number of Factors Variants Shown Total Factor 1 Factor 2	 2 46.89% 26.14 % 20.75 %	Varimax Analysis Parallel analysis used to determine number of factors (Pallant 2001). Factors *loading* 0.30

The Principal Component Analysis (PCA) in this study found four components with Eigen values of more than one (1), at once stating a total of 59.24 percent of variants in the component. The scree technique by Catell (1966) shows all four components were maintained for parallel analysis because this technique cannot precisely determine the number of factors to be maintained. The parallel analysis Monte Carlo is the positively solving factor to determine the number of factors. According to Pallant (2005), the results of parallel analysis with values less than the Eigen value of main component analysis will be kept. The results show only the first two factors will remain for the Varimax rotation. The percentage of variant for both factors from the varimax rotation explains that a total of 46.89 percent of variant with factor one contributing to 26.14 percernt and factor two contributing to 20.75 percent. Tables 2 and 3 show the description of each item representing factor one and two for the safety initiative scale obtained from the factor analysis.

Based on the main objective of this study, the dimensions if the safety initiatives need to be identified and named. The process of naming the factors are extremely subjective and complex. This is due to the varied opinions of various researchers and also depending on their background and research experience (Hair et al., 1998). In this study, the naming of the dimensions is based on the list of items obtained through factor analysis.

Table 2
DESCRIPTION OF SAFETY INITIATIVE ITEMS IN FACTOR 1

Item Number	Description
1.	Assist other employees voluntarily regarding safety procedures and responsibilities towards safety to increase safety at the work place.
2.	Voluntarily participate in safety activities with other employees.
3.	Give suggestions in meetings to other employees as well as to the responsible authorities to enhance safety at the work place.
4.	Always advice and encourage other employees to be aware of safety issues.
5.	Always support by giving opinions on the importance of safety at the work place.
6.	Voice out to the authorities to care about work safety risk at the work place.
7.	Responsibility towards protecting other employees from work risks that contribute to danger.
8.	Take initiatives to observe the safety of other employees.

Table 3
DESCRIPTION OF SAFETY INITIATIVE ITEMS IN FACTOR 2

Item Number	Description
1.	Take action to stop situations that are unsafe to ensure the safety of other employees.
2.	Report to the relevant authorities if there are instances that are unsafe at work.
3.	Inform other employees to adhere to safe work procedures.
4.	The relevant authorities should always inform employees if there are any changes in operating machineries and equipments at the work place.
5.	Voluntarily involved in Safety Council meetings
6.	Ask for information regarding job risks from the relevant authorities or safety representatives as guidelines.
7.	Refuse to carry out dangerous works.
8.	I always think and find alternatives to carry out the work I am assigned in a safer manner.
9.	I always take the initiative to solve problems using a method with low safety risk at the work place.

The list of items for each factor is sent to five experts with knowledge and expertise in the field of occupational safety and health for their opinions. The feedback of three of these experts were accepted and fit the criteria satisfying this study's objective. The details of the feedback are as in Table 4.

Table 4
LIST OF SUGGESTIONS FOR THE NAMING OF FACTOR TWO OF SAFETY INITIATIVE

Expert	Factor 1 Name Suggestions	Factor 2 Name Suggestion
Expert 1	Support and Responsibility	Estimation and Preparedness
Expert 2	Concern for Safety	Preventive Acts for Safety
Expert 3	Shared Responsibility for Safety	Voluntary Safety and Observation

Referring to the analysis of suggestions for the factor one names from the three experts, the researcher found that support, responsibility and concern of an individual towards safety is chosen to be name for factor one. According to Hofmann et al., (2003) to establish behaviour towards safety, employees should take full responsibility of safety like helping and protecting colleagues from occupational risk and danger. Other than that, the individual should have constant communication with his colleagues to increase safety performance and fell that it is a shared responsibility (Moormann & Blakely, 1995). Usually, individuals with a sense of responsibility towards safety are found to be more harmonious with their individuals (Van Dyne

dan LaPine, 1998). Other than that, individuals are not only relying on supervisor's orders to carry out a job perfectly and safely (Boerner dan Dutschke, 2008). This is because there are specific individual traits like more focus, open minded and always looking for new experiences (Boerner dan Dutschke, 2008). Hence, it can be concluded that the name for factor one is more accurate as safety responsibility.

For factor two, three experts had suggested the names estimation and preparedness, preventive acts to ensure safety and voluntary safety and observation. Reason (1990; 1997) found that human error or technical error can increase the potential rate of accidents at the work place. In this matter, individual acts of an employee can influence the good deeds of safety and safety activities at the work place. Hence, lack of alertness towards personal safety will cause employees to be more exposed to accidents (Cooper, 1998, 2000; Geotsch, 2015; Clarke, 1999). The participation of employees in safety activities for example, are not in line with the safety performance at the work place (McSween, 1995). They also prioritise output compared to their own safety. They are also less alert to safety aspects while carrying out their work activities especially in the long run (Geller, 1994; Cooper, 1998). Individuals that are always alert to safety will be proactive especially when related to early prevention to avoid accidents while contributing ideas to solve safety problems at the work place. They are always prepared to face any possibilities, volunteer for safey activities or programmes especially joining safety committees, routine observation of equipment handling, obeying rules and procedures and are cautious in carrying out jobs that contribute to danger. Hence, the name for factor two is safety alert. Both these dimensions, namely safety responsibility and safety alert can describe an indiviual with a high safety initiative. Briefly, the two dimensions of the safety initiative is defined as in Table 5 below.

Table 5
DEFINITION OF THE SAFETY INITIATIVES

No	Dimension	Definition
1	Safety Responsibility	An employee feels a sense of shared responsibility towards the safety of himself and his colleagues
2	Safety Alert	An employee is always put priority towards occupational safety issues (proactive) during performing the duties

Referring to Table 5, an individual with the initiative towards safety is seen as responsible in making sure work activities carried out are safe. Other than that, they should be alert towards safety as this shows their individual personal trait and character. Alertness to safety allows an employee to always be cautious and act safely when carrying out duties at work. They are also motivated to obey safety rules and always give their cooperation by taking part in safety programmes. Thus, the lists of items for each dimension are proven to measure the safety initiative as in Tables 2 and Table 3. From the list, items number 1 to 8 can measure the dimension of safety responsibility while items number 9 to 17 can measure the dimension of safety alert.

CONCLUSION

The analysis of the factors of this research resulted in two dimensions that explain the safety initiatives among paddy farmers. Both these dimensions are safety responsibility and safety alert. Both these dimensions are important to increase the commitment of paddy farmers

towards the hazards and dangers while working on the paddy field. With this, to design a program or activity related to the prevention of accidents among paddy farmers, the responsible authorities should ensure that these programs and activities are oriented to the safety responsibility and safety alert. In addition, these should also be defined in depth towards increasing the knowledge and awareness among paddy farmers in safety at work issues. Furthermore, the responsible authorities involving government or private agencies should play an important role and always give focus towards these two dimensions as initiatives to develop a safe work enviroment in the paddy plantation industry in Malaysia.

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