Jurnal Teknologi

Full paper

Evaluation Criteria of Safety and Health Induction for Construction Worker (SICW) in Malaysia

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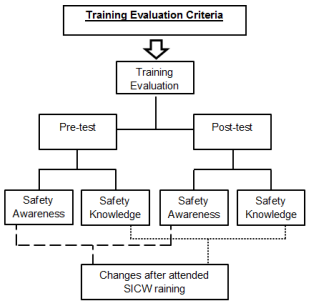
Article history

Received :6 February 2014
Received in revised form :
21 December 2014
Accepted :26 February 2015

Graphical abstract



Training Evaluation Criteria and Process

Abstract

Workplace safety is one the main concern by facilities managers due to high fatality rates in Malaysia construction industry. Occupational Safety and Health (OSH) training is an important effort to reduce workplace accident and improve employees' safety and health in construction industry by enhancing the workers' safety knowledge and awareness on workplace. In Malaysia, Safety and Health Induction for Construction Worker (SICW) or commonly known as Green Card Training, a mandatory safety training, has been introduced by Construction Industry Development Board (CIDB) to the construction related workers in order to enhance the workers' safety knowledge and awareness on workplace. However, SICW has never been evaluated in term of its effectiveness in delivering safety knowledge and awareness to the workers since it has been introduced. Therefore, an evaluation is needed to be carried out to evaluate the safety knowledge and awareness gain by the workers from SICW. This paper will show the evaluation criteria for SICW based on the topics covered by standardized materials provided by CIDB. The evaluation criteria will serve as a guideline for evaluation of SICW in future research.

Keywords: Safety training; Safety and Health Induction for Construction Worker (SICW); safety knowledge; safety awareness; evaluation

Abstrak

Keselamatan di tempat kerja adalah satu kebimbangan utama oleh pengurus kemudahan disebabkan kadar kematian yang tinggi dalam industri pembinaan Malaysia. Latihan *Occupational Safety and Health (OSH)* adalah satu usaha yang penting untuk mengurangkan kemalangan di tempat kerja dan meningkatkan keselamatan dan kesihatan pekerja dalam industri pembinaan dengan meningkatkan pengetahuan keselamatan dan kesedaran terhadap tempat kerja di kalangan pekerja. Di Malaysia, *Safety and Health Induction for Construction Worker (SICW)* atau dikenali sebagai *Green Card Training*, merupakan satu latihan keselamatan mandatori yang telah diperkenalkan oleh *Construction Industry Development Board (CIDB)* untuk pekerja-pekerja yang berkenaan dengan pembinaan bagi meningkatkan pengetahuan dan kesedaran pekerja tentang keselamatan di tempat kerja. Walau bagaimanapun, *SICW* tidak pernah dinilai dari segi keberkesanannya dalam penyampaian pengetahuan dan kesedaran tetang keselamatan kepada para pekerja sejak ia diperkenalkan. Oleh itu, penilaian perlu dilakukan untuk menilai pengetahuan dan kesedaran tentang keselamatan yang diperolehi oleh pekerja daripada *SICW*. Kajian ini akan menunjukkan kriteria penilaian untuk *SICW* berdasarkan topik-topik yang diliputi oleh bahan yang disediakan oleh *CIDB*. Kriteria penilaian tersebut akan menjadi garis panduan untuk penilaian *SICW* dalam penyelidikan masa depan.

Kata kunci: Latihan keselamatan; Safety and Health Induction for Construction Worker (SICW); pengetahuan keselamatan; kesedaran keselamatan; penilaian

1.0 INTRODUCTION

Facility management (FM) is an emerging discipline across the globe. It is one of the fastest-growing professions in United Kingdom for its cost-cutting initiatives and FM has demonstrated significant contribution in adding value to the organization's core business.[1-3] The management of workplace is the main focus for FM and workplace refers to a place where work is carried out.

Therefore, the management of workplace could include but not limited to space management, environmental management, support service management, human resource management, financial management, etc.[4]

Safety is one of the most concerned elements in the workplace for the sky-high fatality status around the globe. In most organization, especially high risk industries, safety issues in workplace are the main priority to be tackled. Today, construction industry is regarded as one of the most unsafe industrial sectors worldwide.[5-7] According to International Labour Organization (ILO)[8], there are at least 60,000 people are fatally injured in construction industry each year and there are many more suffer serious injuries and ill-health. This number could represent only less than 20 per cent of actual construction injuries reported.[8] Locally, Department of Occupational Safety and Health Malaysia (DOSH), Ministry of Human Resources has recorded a total of 763 cases of accidents from 2007 to 2012 in Malaysia's construction industry and 422 or 55% from the number was fatality accident.[9]

Any loss of life as a result of an industrial accident is retrogressive in terms of human resource development and therefore it is unacceptable, not to mention the cost of the accident. ILO[8] estimated the total cost of accident in 2001 is 4 percent of world gross national product (GNP). In 2001, 4 per cent of world GNP came to more than $1,251,353 million. In Malaysia, Social Security Organisation (SOSCO) recorded RM316 million for employment injury compensation in 2003 and the number has increased to RM 716 million in 2012.[10] These evidences suggest that the effective effort should be in place to reduce the accident rate and eventually the related cost for accident.

Identification of causes and effects of the accident is an important prevention strategy to reduce the growing number of injuries and fatalities among workers. According to Sawacha *et al*.[11], the occurrence of accidents was much related to the lack of competency skills and knowledge of the worker to perform safely in the workplace. Whereas other researchers reported that unsafe worker behaviour is frequently led to unsafe acts on the workplace which causes accidents.[12-16] It should be noted that safety knowledge and awareness and safe work behaviour are inter-related. According to Musonda and Smallwood[17], health and safety awareness is an antecedent of displays of behaviour, with accidents and incidents being the consequences of behaviour in the industry. Therefore, to reduce the occurrence of accidents in workplace, it is essential to improve the safety knowledge and awareness of the workers which would later result improvement in the safety behaviour of the workers. To improve the workers safety knowledge and awareness, safety training has been seen as an important effort that should be provided to the workers.

The paper has been organized in the following ways: Section 2 introduces on safety training. Section 3 describes on Safety and Health Induction for Construction Worker (SICW). Section 4 shows on SICW evaluation criteria. Section 5 discuss on training evaluation for SICW. Section 6 presents the conclusion of the paper.

■2.0 SAFETY TRAINING

Occupational Health and Safety (OHS) training is an important effort to reduce workplace accident and improve employees' health and safety in construction industry by enhancing the workers' safety knowledge and awareness on workplace. Realising the important of safety in construction industry, Construction Industry Development Board (CIDB) as the regulated body for construction industry in Malaysia has work closely with National Institute of Occupational Safety and Health (NIOSH) to conduct Safety and Health Induction for Construction Workers (SICW) or commonly known as Green Card Training.[18]

According to OSHA, the purpose of safety training is to ensure the employees to be able to perform a job safely by establishing expectations for employees on how to perform job tasks. It is believed that safety training could help to reduce accidents, injuries, compensation costs and increase employees' safety awareness in the workplace.[19-21] Therefore, it is important for the construction workforce to be well trained, so they would be able to identify and react against the possible risks and hazards associated with their workplace.

Safety training is of paramount important for all the construction-related workers however to-date, it should be brought into attention that SICW is currently and remains still the only mandatory safety training as enacted by Malaysia legislation since 1997. In addition, it is also found that not all the construction firms would provide additional safety related training to worker especially for smaller firms as training is an expensive investment.[22-23] According to Oberman[24], employees' safety training has been regarded as the "first line of defence" in opposition to accidents and dangerous occurrences. However, this so called "first line of defence" may also appear to be "the only line of defence" for some construction personal as SICW may be the only safety training they will receive from their employers during their term of employment. The role of SICW is too great; it should not be allowed to be ineffective. Therefore, it is important to ensure the effectiveness of this particular SICW to deliver the necessary safety knowledge and awareness to the workers.

In Malaysia, every construction related personnel must attend this mandatory safety training course (SICW) before they are allowed to enter the construction sites. Those who have attended the training will be given a green card as proof of registration with CIDB. Due to this reason, enormous amount of construction related personnel in Malaysia have attended SICW training and more are yet to come.

■3.0 SAFETY AND HEALTH INDUCTION FOR CONSTRUCTION WORKER (SICW)

Construction personnel are required to attend a one day safety training (SICW), which is the only mandatory training in Malaysian construction industry to obtain a green card before entering the construction sites. SICW is done through training in a classroom setting delivered by a NIOSH registered SICW trainer.

The concept of SICW is to help the construction workforce understand the OSH legislations and regulations, the hazards, risks involved in working in or near construction environment, types of hazards and potential risk, various safety and health prevention methods and introduction to personal protective equipment. According to CIDB, the objectives of SICW are:

1. *To ensure that the Construction Worker is aware of the importance a safe and healthy working place*
2. *To provide a basic knowledge on safety and health at the Construction work site*
3. *To inform Construction Workers of the legal requirements in relation to safety and health*

The purpose of having SICW is to impart the safety knowledge, awareness and skill to the worker while shaping their safe work acts and behaviours to reduce the workplace accident. According to Cooper[25], safety training has been used as an effort to mitigate the worker's safety behaviour and safety attitudes in the workplace. It is expected that SICW could help employees to

gain safety related knowledge, enhance skills and gain a more positive attitude as well as make them competent in performing their jobs with regards to safety and health.

Besides, SICW also provides an insurance benefit for the trainees who attend the green card training. CIDB will issue an identification card (Green Card) for those who have attended the training. Green card holders will automatically be covered by a special insurance scheme that insures the construction personnel against death and accident. Casualty will be entitled to enjoy an insurance benefit by Takaful Nasional which accidental death of the green card holder will receive an amount of compensation amounting to RM21,500.00. With this compulsory formal safety training required by Malaysia's legislation, green card training has become an exceptional important training for new entries of all construction-related personnel not only to gain the very first safety-related knowledge on construction environment but also to be protected by an insurance scheme.

Unfortunately, SICW has never been evaluated in term of its effectiveness of safety knowledge and awareness gain among the workers. Without a proper training evaluation, the information regarding the effectiveness of training remains uncertain and no systematic analytical strategy could be made to improve the effectiveness of SICW. Training evaluation is needed to measure whether trainees have achieved learning outcomes and also whether predetermined objective results of the training has been achieved.[26] Therefore, it is important to identify the topics and safety information that are provided in SICW which would serve as the evaluation criteria to monitor the effectiveness of SICW in term of safety knowledge and awareness gain.

4.0 SICW EVALUATION CRITERIA

As mentioned by Bakri *et al.*[18], due to different background of the construction workers in Malaysia, training materials for SICW are delivered using simple and easy understanding approach (in the form of picture presentation and less form of writing). The main frame training materials are provided by the CIDB to the trainers for the delivery of SICW training. However, training instructors are allowed to add in additional information base on their understanding, for better understanding of the trainees.

It is also noted that the trainings will be conducted in both English and Bahasa Malaysia (Malaysia native language) depends on the backgrounds and culture among the trainees. Although the trainers are allowed to choose the language to conduct the training and add-in additional information on their training materials, they are all covered the same topics that have been specified by the CIDB. This means that, it does not matter which trainings the trainees attend, they are all delivered with the same safety messages, knowledge and awareness. The only thing that makes the trainings differ is the way of delivering training by the trainers. So, to evaluate the effectiveness of SICW in term of safety knowledge and awareness gain among the trainees, the main topics that have specified by the CIDB for the delivery of SICW should serve as the evaluation criteria. By referring to the standardised materials (presentation slide, safety induction book and safety guidelines for construction workers) as provided by CIDB, the topics that cover during SICW are summarized in Table 1 and brief descriptions on every topic are provided in the table as well. The evaluation of the SICW should be designed and fit to those topics and aims that have been specified by the CIDB for SICW in order to unify the evaluation of all SICW trainings. Figure 1 summarises the training evaluation criteria and evaluation process of this research.

5.0 CONCLUSION

Evaluation of training and development is the most essential aspect of training programme. An effective training usually starts with identification of training and development needs and ends with evaluation of training.[27] Training evaluation would ensure whether the trainees are able to transfer from what they have learnt to their work.[28] In other words, training evaluation is able to monitor the process and results from the transfer of training, then serve as guiding information for the decision maker to decide what should be done for those training instruments. Training evaluation and development will assess the impact of training on trainee's performance and behaviour.[29] Without training evaluation, the organizations do not know which to stop, modify, continue and maintain. Most often, trainers will keep on using the same teaching method, training contents or tests in conducting training without any evaluation. Without knowing the existence problem and the underlying causes, it is difficult for training improvements or enhancements.

There are quite a numbers of training evaluation models exist, all of which include the differences in evaluation criteria and method. However, there are three most common training evaluation models can be referred for the purpose of training evaluation, namely; Kirkpatrick's Four Level Evaluation Model Structure, CIRO Evaluation Model and Kaufman's Five Levels of Evaluation.[27, 30-31]

Basically, the evaluation method suggested by the training evaluation models mainly focused on three aspects which are trainees' reactions towards the training, the effectiveness of the training program itself, and the impact of the training to the organization. It should be noted that, the focus of this research is on SICW training program provided to the workers. Therefore this research will focus on the evaluation stages on the effectiveness of the training program itself.

In Kirkpatrick's Four Level Evaluation Model [27], the evaluation stage focuses on the effectiveness of the training program is in level 2 of learning evaluation. Learning evaluation is to measures skills, knowledge or attitude changes as a result of the training. Whereas, CIRO evaluation approach has suggested three levels of assessment to evaluate the outcome of the training[30]. The three levels assessment involves are immediate, intermediate and ultimate evaluation. Immediate evaluation attempts to measure changes in knowledge, skills or attitude before a trainee returns to the job. Intermediate evaluation focuses on the impact of training on the job performance and how knowledge is transferred back to the organization and lastly, ultimate evaluation attempts to assess the impact of training on departmental or organizational performance in terms of overall results. In this evaluation model, the immediate evaluation is the stage where the evaluation on the effectiveness of the training program itself takes place. Kaufman's Five Levels of Evaluation[31] is similar to the evaluation method suggested by Kirkpatrick[27], however it has an extended level to evaluate the contributions of the training program to and from the client and society as a whole. In this evaluation model, the stage involves on evaluating the training program itself is in level 2. The evaluation criterion for this level is acquisition where it is identical to Kirkpatrick's level 2 of evaluation on learning. This level measures the difference in the knowledge or intellectual capability of the trainees from their before to after the learning experience.

Table 1 Description of topics covered and the aim and messages conveyed by the instructors in SICW

Topics	Aim and message conveyed by the instructor
OSHA 1994	Information about the responsibility for both employer and employee towards safety and types of punishment and fines for those who violates the rules.
Housekeeping and cleanliness	The instructor provides samples of accidents due to improper management and housekeeping on construction site. Besides, information about the purpose to practice good housekeeping practice are provided such as installation of fences on the construction site; manage the entrance to site; manage the safety walk path for the workers; proper ways to store the items; proper way to dispose waste on construction site and workers falling prevention.
Fire Prevention	Information about the common causes of fire in construction site; the theory of triangle of fire that generate fire; the responsible of workers during fire; proper evacuation route and plan when fire; selection and usage of proper fire extinguish tools to put out fire.
Hazard from electric	The instructor provides information on the possible hazards of working with electricity; samples of unsafe practice of using electricity; provide proper way to use electricity. Besides, information about the use of power tools is provided including the unsafe practice when using power tools (such as power drills, air compressor, circular saws and grinders) and proper method of handling and safety precautions when using power tools.
Transportation and mobile plant	Information about the types of transportation vehicles and mobile plants (such as excavator, forklifts, dumpers, etc) and examples of dangerous practice when driving the heavy vehicles on site.
Excavation	The instructor provides example of accidents related to excavation; samples of improper excavation method and samples of proper way to excavate. Besides, the instructor also shows what should be consider before excavation work starts.
Roof work	Information on how to perform roof work safely with the use of personnel protective equipment and the tools such as ladder and guard rail.
Working on live roads	Information about hazards working on live roads, safety precaution and safety action to work on live road and during night time.
Chemical hazards	Information about the types of hazardous chemical, some possible sign of chemical hazards and ways to prevent hazardous chemical.
Working at height	Information about the hazards working at height, types of scaffolding, the proper safe working environment on scaffolding and proper installation of scaffolding,
Personnel protective equipment	Information about the types of personnel protective equipment, first aids kits and selection of proper protective equipment for the work.

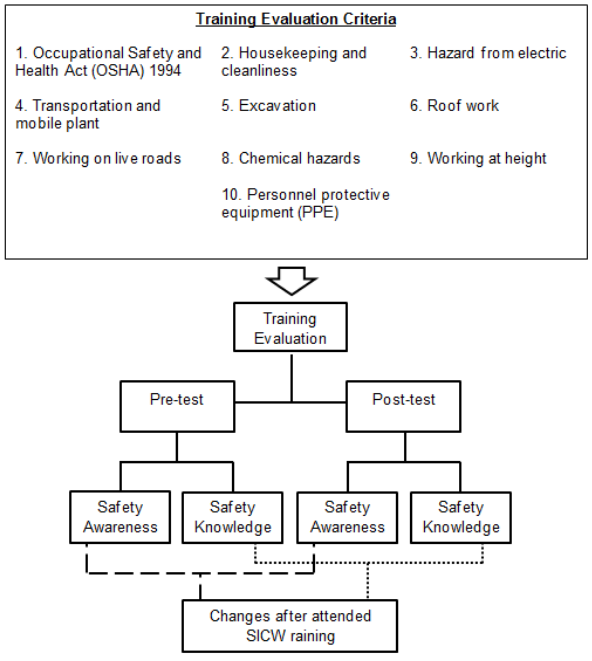


Figure 1 Training evaluation criteria and process

Having review on three different training impacts measurement methods, it was found that all training evaluation methods have emphasized on knowledge and awareness gained by the trainees from the training. It is important to ensure the effectiveness of safety knowledge and awareness gain from the training as they are essential in shaping the worker's workplace behaviour, subsequently the successful transfer of training where they can apply what they learned from the training to their daily works and reduces the workplace accidents. Therefore, it is necessary to ensure the safety knowledge and awareness gained by the trainees as they are the foundations for successful transfer of training.

It is noted that these three training evaluation models have suggested pre- and post-training evaluation to measure the knowledge and awareness gained by the trainees from training. Pre- and post- training evaluation will be carried out before and after the training, by doing so, the safety knowledge and awareness gained from training could be more precisely measured. Therefore, pre- and post- evaluations are suggested for the evaluation of SICW with the topics and aims covered by SICW serve as the evaluation critetia, where the pre- and post-evaluations will be used as measurement tools for SICW training evaluation in term of safety knowledge and awareness gain.

6.0 CONCLUSION

Safety and Health Induction for Construction Workers (SICW) or commonly known as Green Card Training is mandatory training in Malaysian construction industry for the purpose to impart the safety knowledge, awareness and skill to the worker, which is believes to be able to shape workers' safe work acts and behaviours and subsequently reduce the workplace accident. Unfortunately, SICW has never been evaluated previously in term of its effectiveness in enhancing the safety knowledge and awareness among the workers. The absence of such evaluation has caused the information regarding the effectiveness of training remains uncertain and no systematic analytical strategy could be made to improve the effectiveness of SICW.

Therefore, a proper evaluation on SICW is needed in order to see its effectiveness in enhancing workers' safety knowledge and awareness. To evaluate the effectiveness of SICW in term of safety knowledge and awareness gain among the trainees, the main topics and aims that have specified by the CIDB for the delivery of SICW should serve as the evaluation criteria in order to unify the evaluation of all SICW trainings.

Acknowledgement

The author is thankful to Centre of Real Estate Study for the financial supports.

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